NGATI TAHU-NGATI WHAOA
RUNANGA

RISING ABOVE THE MIST - TE ARANGA AKE I TE TAIMAHATANGA

Ngāti Tahu - Ngāti Whaoa Iwi Environmental Mangaement Plan

IMAGE CREDITS

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Ngati Tahu- Ngati Whaoa Iwi Environmental Management Plan

PART I : TIROHANGA WHANUI

Overview

PART II: NGA TAONGA O TAIAO

Treasured resources

Part III: HEI MAHI

Implementation and actions

RISING ABOVE THE MIST - TE ARANGA AKE I TE TAIMAHATANGA

NGATI TAHU-NGATI WHAOA IWI ENVIROMENTAL MANAGEMENT PLAN

PART I: TIROHANGA WHANUI - OVERVIEW

CONTENTS

Mihi Composer, Uncle Dan

MIHI

No Ihowa te whenua, me ona tini mea, te ao,
me nga tangata e noho ana i runga.

The earth is the LORD's, and the fullness thereof: the world, and they that dwell therein.

Na, ka tango a Ihowa, te Atua, i te tangata, a, whakanohoia ia ki te whenua,
hei ngaki, hei tiaki hoki i reira.

Then the LORD God took man and put him on the land, to tend and keep it.

Nga maumahara aroha,
mo nga tini aitua kua wheturangitia.
Kua wehe atu ratou i tenei ao hurihuri
ki te ao marama.
No reira nga mate huhua,
haere, haere, haere atu ra.

Loving memories, of the many who have been immortalised. They have departed this ever-changing world to the world of light.
Therefore to the many departed, thrice farewell.

He mihi ki nga matawaka, nga mana,
nga kaitiaki rawa taiao, me nga poutiriao o
Papatuanuku. Tena koutou katoa.

Greetings to the tribes, authorities, custodians of environmental resources, and guardians of Mother Earth. Acknowledgement to all.

He turoa te hononga matatau o te Maori ki te whenua, moana, me nga wai kaimata, mai ra no. He hononga ngatahi a wairua a tinana hoki. I whakaratoa e Papatuanuku te kotahitanga me te ahurei ki tana iwi.

Kahore he whakaarotanga o te Maori onamata mo te tino rangatiratanga o nga whenua, kore rawa hoki te kotahi i whai whenua. Ma nga rawa noa, ka manaakitia ai te oranga kotahitanga o te katoa. I mua i te paunga o nga rawa, ka whakatakotoria he "rahui" ki tena wahi, tae noa ki te wa whai auroa ai ano.

Huri atu ki te whakaarotanga mo te whai wahi turanga. I te tirohanga aowhanui o te Maori, ko te nuinga o te koiora e rapu ana tetahi ki tona turanga me tona wahi i roto i tenei ao.

I whakapuaki tikangatia ma roto i te hononga o te iwi ki nga wāhi ake, pēnā ki te maunga, pae, awa, roto rānei.

Ma tenei rongo ka whiwhi ai nga iwi a rohe i te ngakau mohio mo te ahua takoto o o tatou rawa, a, me pehea te whaihanga mo nga raruraru kua ara ake. Mena kei te ora tonu te taiao, na, me mau tonu ki tena ahuatanga.

Ka whai atu nei nga mihi ki a ratou, na ratou nei, i whakarato te matauranga me te tautoko mo tenei kaupapa

Tena tatou katoa
Th Fraser.

Maori had an enduring and intimate association with the land, sea, and fresh waters since time immemorial. That connection is both physical and spiritual. Mother Earth provided unity and uniqueness to her people.

Early Māori society did not have a concept of absolute ownership of land, and certainly, no individual owned land. The natural resources were the means of sustaining the collective livelihood of all. Before depletion of a resource, a "ban" would be placed on that area until sustainability was again realised.

Then there is the concept of having one's place to stand. In the Māori world view, much of life is about finding one's foundation and position in the world.

This was traditionally expressed through a people's relationship with particular places, such as a mountain, a range, a river, or a lake.

This report will give communities a better understanding of the state of our resources and how better to deal with problems that may have arisen. Where the environment is healthy, this then must be maintained.

Following below are the acknowledgements to those, the individuals, who have provided knowledge and support for his project.

Greetings to all.
TH Fraser

ACKNOWLEDGEMENTS

ORIGINAL IWI ENVIRONMENTAL MANAGEMENT PLAN

Many people and organisations played a part in producing the first version of this Iwi Environmental Management Plan in 2013. Iwi members contributed their time, thoughts and creativity, both as participants and as ringawera at the series of hui held to gather iwi views. A special mihi goes to the tamariki and those who encouraged them through art and activities to express their ideas about the taonga of the iwi. We are grateful for the guidance of kaumatua and Runanga members who provided input and feedback, including recollections from their own life experience. The staff of the Ngati Tahu-Ngati Whaoa Runanga Trust worked hard coordinating, organising, administering and participating in the process.

Funding for the original Iwi Environmental Management Plan project came through Te Arawa River Iwi Trust, whose staff also provided ongoing support and feedback. We acknowledge the input of the Department of Conservation (DOC) and Waikato Regional Council (WRC). Staff from these agencies attended hui to dialogue with the iwi, fed in useful information and reviewed a draft of the plan. Personnel from Hancock Forest Management, Tutukau East Z Trust and Tauhara North No 2 Trust also attended hui and/ or provided information for project snapshots.

Waikato Regional Council made a further contribution through valuable GIS support, creating a series of maps for the document. Wildlands Consultants, Taupo District Council and Rotorua Lakes Council provided information on Significant Natural Areas within the rohe. Other photographs and diagrams were sourced from Te Arawa Lakes Trust, GNS Science, Wildlands Consultants and WRC.

UPDATED IWI ENVIRONMENTAL MANAGEMENT PLAN

In reviewing and republishing this Iwi Environmental Management Plan in 2018, feedback was provided by iwi members at a review hui. Further input came from Bay of Plenty Regional Council (information on the Rangitaiki catchment), Waikato Regional Council (GIS/ maps and technical updates), Landcorp and Timberlands (snapshots) and the prioritisation work done with iwi for the *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa* (produced by the Waikato Regional Council, DairyNZ and the Waikato River Authority). Staff and contractors to the Ngati Tahu-Ngati Whaoa Runanga Trust collated and updated information and coordinated the review.

Graphic design and layout for both documents was done by **Halo Consultants**.

Ki a koutou katoa i whakapau kaha ki te tutuki i enei mahi hei painga mo nga uri whakatipu: he mihi aroha, he mihi mutunga kore ki a koutou. Tena koutou, tena koutou, tena koutou katoa.

STATEMENTS OF SUPPORT

WAIKATO REGIONAL COUNCIL

The Waikato Regional Council (WRC) is delighted to provide this response in relation to the Ngati Tahu-Ngati Whaoa Iwi Environmental Management Plan (IEMP).

The guidance for how WRC will work with and recognise this IEMP is found in a number of key sections and clauses in the Resource Management Act (RMA). It is important for all parties concerned that WRC has this guidance to rely on under the RMA to ensure the correct application and implementation of all iwi planning documents. WRC also has the ability to apply current best practice methods to work effectively and build enduring relationships with Ngati Tahu-Ngati Whaoa.

WRC recognises this IEMP in the manner prescribed by the RMA as an 'iwi prepared planning instrument'. Therefore, as a consent authority when considering an application for resource consent, WRC must have regard to the IEMP, if s104 RMA applies to the plan. Additionally, WRC must recognise the IEMP when preparing, reviewing or changing an RMA planning document in the manner required under the RMA. WRC accepts the IEMP is not intended to replace existing communication avenues, but rather is an additional vital instrument in the communication and collaboration toolkit. It is certain that both organisations place a high value on one-to-one or 'rangatira-ki-te-rangatira' engagements and wish to see those types of communications continue.

The benefits of iwi planning documents are potentially quite extensive and they can be regarded as useful tools for understanding the concerns of iwi as they relate to the RMA and WRC planning, setting out iwi priorities on environmental matters and outlining how iwi wish to participate in environmental matters with council.

WRC appreciates the effort Ngati Tahu-Ngati Whaoa have put into this IEMP and acknowledges the desire to work more closely with WRC to strengthen relationships and promote better understanding between both organisations.

Vaughan Payne / Chief Executive

DEPARTMENT OF CONSERVATION

The Department of Conservation was established under the Conservation Act 1987 and is charged with promoting and advocating for conservation with primary functions to manage all lands and other natural and historic resources held under the Act, and to preserve and protect so far as practicable all indigenous freshwater fisheries and habitats. The Department promotes these functions by developing enduring relationships between communities of interest including recognised iwi authorities.

The two District Offices within the rohe, Tauranga/Rotorua and Central Plateau, have developed strong working relationships with the Ngati Tahu-Ngati Whaoa Runanga Trust, through both regular

formal meetings but primarily through partnerships associated with many on-the-ground projects. The relationship is based on shared values and a desire for healthy and sustainable ecosystems, to see people enjoying the places under our management and generating opportunities for the people of Ngati Tahu-Ngati Whaoa.

The Iwi Environmental Management Plan is a living document that enhances our relationship and supports our shared values.

Department staff assisted towards the development of the plan, which has a primary purpose of guiding the management of resources from an iwi perspective within the Ngati Tahu-Ngati Whaoa rohe, and helps to inform the work and planning the Department undertakes throughout both Districts.

The Department acknowledges the efforts of all involved towards ensuring the plan remains a living document and looks forward to continuing to strengthen our relationship with the people of Ngati Tahu-Ngati Whaoa.

Helen Neale / Acting Operations Director / Central North Island

WAIKATO RIVER AUTHORITY

He tino whakahirahira te hononga ki a Ngati Tahu-Ngati Whaoa raua ko Te Arawa River Iwi Trust. Naku te rourou, nou te rourou, ka ora ai te Awa, ka ora ai te Iwi o Ngati Tahu-Ngati Whaoa.

The Waikato River Authority enjoys a special relationship with Ngati Tahu-Ngati Whaoa through the Te Arawa River Iwi Trust, which is an appointer to the Authority's board. With our resources, and their resources, the River will improve and so will the people of Ngati Tahu-Ngati Whaoa.

Our vision and goals for the Awa are therefore inseparably linked, namely, to see the Waikato River restored and protected for generations to come.

We have already worked closely with Ngati Tahu-Ngati Whaoa over the past several years and we look forward to continuing this mahi into the future.

Bob Penter / Chief Executive


TE WAIHEKE O HUKA
POHATUROA

Toitu te whenua,
toitu te awa,
toitu te tangata

The land, the river, the people are everlasting.

FOREWORD

This is an update to the first Iwi Environmental Management Plan prepared by Ngati Tahu-Ngati Whaoa in 2013. Our tupuna needed no such document to instruct or guide them in ensuring the protection and conservation of Papatuanuku. The very survival of our people depended upon living as one with our natural resources; sustaining the mauri of a resource enabled that resource to sustain its people.

The Ngati Tahu-Ngati Whaoa Runanga Trust must, as the mandated iwi authority, honour those who have walked before us - not only our many tupuna but our rangatira, our kaumatua who never gave up the fight to retain our lands, our treasured resources that were the backbone of our way of life.

To those who contributed to the early years of establishing Ngati Tahu-Ngati Whaoa Runanga Trust, your tireless work lives on in the legacy we leave for the generations to come.

To Rawiri Te Whare, who led and served our iwi for many years, whether on the paepae with tangata whenua or with Crown during negotiations: you led your people with dignity and strength.

Haere, haere, haere atu ra e te rangatira.

While this document is an environmental plan, let us remember the most powerful resource that we have been blessed with – he whanau, he iwi, he tangata:

Hutia te rito o te harakeke. Kei hea te komako e ko?

Ki mai ki ahau, "he aha te mea nui o tenei ao?"

Maku e ki atu ... "he tangata, he tangata, he tangata".

We cannot accomplish all that we need to do if we do not work together.

Our Iwi Environmental Management Plan takes the name "Rising above the mist". Soft mists have always been a feature of our rohe, arising from the Waikato River and the rich wetlands that naturally occurred throughout our tribal lands. Our mountain ranges break through these mists and afford us a clear vantage point from which to see where we have been and where we might go next. "Rising above the mist" infers that by working together, we may surmount any confusion or trouble that we may find ourselves in at the present time, obtain an expansive view of our terrain, and chart our way forward to a bright and prosperous future.

Evelyn Forrest

Evelyn Forrest / Environmental Manager
Ngati Tahu-Ngati Whaoa Runanga Trust Trustee
Te Arawa River Iwi Trust Trustee

WHAKATAKINGA – INTRODUCTION

An Iwi Environmental Management Plan is a living document developed by iwi, for iwi, and to inform others about things important to iwi. It provides a guide to how management and protection of the environment can be achieved based on cultural and spiritual values of tangata whenua.

The purpose of this plan is to identify environmental resources and issues within the Ngati Tahu- Ngati Whaoa rohe, and to guide the management of those resources from an iwi perspective. It is important because:

- It provides a 'road map' for identifying our environmental issues and how we will make positive change.
- It informs and transfers knowledge from an iwi perspective.
- External parties will consider this plan when reviewing their own plans, planning developments and carrying out work in the rohe.

This Iwi Environmental Management Plan is an iwi planning document recognised by an iwi authority, and as such it has weight under the Resource Management Act.

The plan covers all of the rohe (see below: Mana whenua - land and identity). It is an overarching plan that integrates across a number of relevant documents and pieces of legislation, including:

- **Resource Management Act 1991 and any subsequent reforms**
- **Local Government Act 2002**
- **Conservation Act 1987; Reserves Act 1977; Walking Access Act 2011**
- **Historic Places Act 1993**
- **Biosecurity Act 1993**
- **Fisheries Act 1996 and associated regulations**
- **Forests Act 1949**
- **Soil conservation and drainage legislation**
- **Settlement legislation and statutory acknowledgements**
- **Other Accords.**

Te Tiriti o Waitangi is recognised as a foundational document underpinning this plan. In particular, Article 2 of Te Tiriti acknowledges the tino rangatiratanga (chiefly authority) held by hapu over their whenua, kainga and all taonga. This IEMP is a statement of how Ngati Tahu-Ngati Whaoa wish our rangatiratanga to be expressed in the management of the environment in our rohe.

The scope of this plan includes cultural, economic, social and community issues which provide the context for managing natural and physical resources. Marae and significant sites are considered by iwi members to be part of our environment, and are included in this plan.

How This Plan Was Developed

To develop the initial plan in 2013, a series of hui was held. This included a haerenga for kaumatua, to gather information on what the rohe was like in former times. An iwi bus tour followed this trip, and three other hui-a-iwi were held on local marae to get input for the plan. One of these hui had a

focus on native plants and animals, and DOC staff attended to give input. Special topic hui were also held on geothermal issues (at Ohaki Marae) and on land and water (at the Tutukau dog trial rooms). Trustees from several blocks attended this hui along with Waikato Regional Council staff. Topics included farming and water quality, forestry, and protection and restoration of native flora and fauna.

Further liaison also occurred with staff of the Te Arawa River Iwi Trust and with key organisations involved in environmental management, including the Department of Conservation, local government and forestry companies. Discussions occurred with those working for other iwi to prepare their plans.

Relevant documents were reviewed and regional environmental monitoring information was accessed.

For the 2018 review, a further hui-a-iwi was held, and iwi priorities were updated, including those identified for the *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa*. Environmental information was refreshed, and new material was drawn from recent projects *(Nga Tohu o te Taiao and the booklet Mahinga Kai: Ngati Tahu-Ngati Whaoa Story)*. Action sections have been moved into a separate Part III, to allow for easier tracking of progress.

Who Should Use This Plan

This plan can be used by members of the iwi to inform practices that support kaitiakitanga of natural resources. The intention is that any iwi member can pick up this plan and use it.

This includes iwi bodies to which Ngati Tahu-Ngati Whaoa is affiliated, such as the Te Arawa River Iwi Trust (TARIT). TARIT has developed other documents to progress the protection and restoration of the Waikato River, such as their 2015 Environmental and Fisheries Plans *Whakamarohitia nga wai o Waikato.* The vision stated in the TARIT Environmental Plan is "to support Te Arawa River Iwi collectively and individually to assert mana awa and improve the health and wellbeing of the Waikato river, tributaries and environs."

Rising above the mist: Te aranga ake i te taimahatanga should be seen as the primary iwi planning instrument for the rohe of Ngati Tahu-Ngati Whaoa, and therefore takes priority over any other iwi planning documents in this area. It may inform further TARIT plans and also reviews of Joint Management Agreements and Accords which TARIT enters into with local and central government.

Some lands within the rohe are administered by independent iwi land Trusts. Marae also have their own Trusts and Committees. This plan is not intended to impinge in any way on the independence of these governing bodies. Rather, the hope is that information in this plan will be useful to Trustees and Committee members, and foster further collaboration between iwi structures.

The plan should also be actively used by statutory agencies. These include central government, local government (see Map 5) and co-management bodies such as the Waikato River Authority.

The Resource Management Act requires that Regional Policy Statements must state the management issues of significance to iwi authorities in the region. When writing Regional Policy Statements and Regional or District Plans, local government must take into account any relevant planning document recognised by an iwi authority (RMA S61, 66, 74). This plan is recognised by Ngati Tahu-Ngati Whaoa as a relevant planning document. Local government may also consider the contents of this plan in any decision to transfer powers to iwi authorities (S33) or make joint management agreements (S36b). The plan may also be considered as a relevant document when assessing resource consents.

Section 4 of the Conservation Act (1987) requires the Act to be interpreted and administered so as to give effect to the principles of the Treaty of Waitangi. Information in this plan will be helpful to staff of the Department of Conservation in carrying out this duty. This plan can also inform future reviews of the Memorandum of Understanding between the Department and the iwi regarding sites under DOC management where statutory acknowledgements have affirmed the interest of the iwi in those sites.

Parties involved in commercial activity will find useful information in this document, wherever that activity involves use of natural resources within the rohe of Ngati Tahu-Ngati Whaoa.

Reference to this plan in no way negates the need for proper consultation with the iwi authority Ngati Tahu-Ngati Whaoa Runanga Trust. This involves timely, informed and ongoing dialogue, carried out in good faith, and with an open mind. Should there be a need for wider iwi consultation e.g. with land blocks, whanau, or marae, the Runanga will guide the process for a wider consultation.

HOW THIS DOCUMENT IS SET OUT

The Iwi Environmental Management Plan is in three parts.

Part I is an overview of the rohe, its environmental features and their history.

Part II takes each taonga or resource within the environment and describes its historical and current state, pressures affecting it and guiding principles for managing that resource. Short-term and long-term goals are identified. While each environmental resource is addressed in turn, in reality all are interconnected and the iwi encourages consideration of the environment as a whole.

There is now a separate **Part III** *Hei Mahi: Implementation and Actions*. This identifies key opportunities to protect and restore resources, and provides a progress report since the last update of the plan, a list of current actions and ideas for future actions. Snapshots are included to feature some current initiatives.

Up-to-date information on projects and progress on actions can also be found on the website of Ngati Tahu-Ngati Whaoa Runanga Trust : **www.tahu-whaoa.iwi.nz**

MANA WHENUA – LAND: OUR AUTHORITY

This section outlines the traditional areas of Ngati Tahu-Ngati Whaoa, features of the rohe and historical information that identifies the iwi relationship with the natural environment.

Mai i te waiheke o Huka

Whakarāwhiti atu ki te Māni a o Kāingaroa

Te Tihi o Maunga Kakaramea

Puta atu ki te Pae Maunga o Paeroa

Ko Orakei Korako te Ukaipo

Tae rawa atu ki Pohaturoa

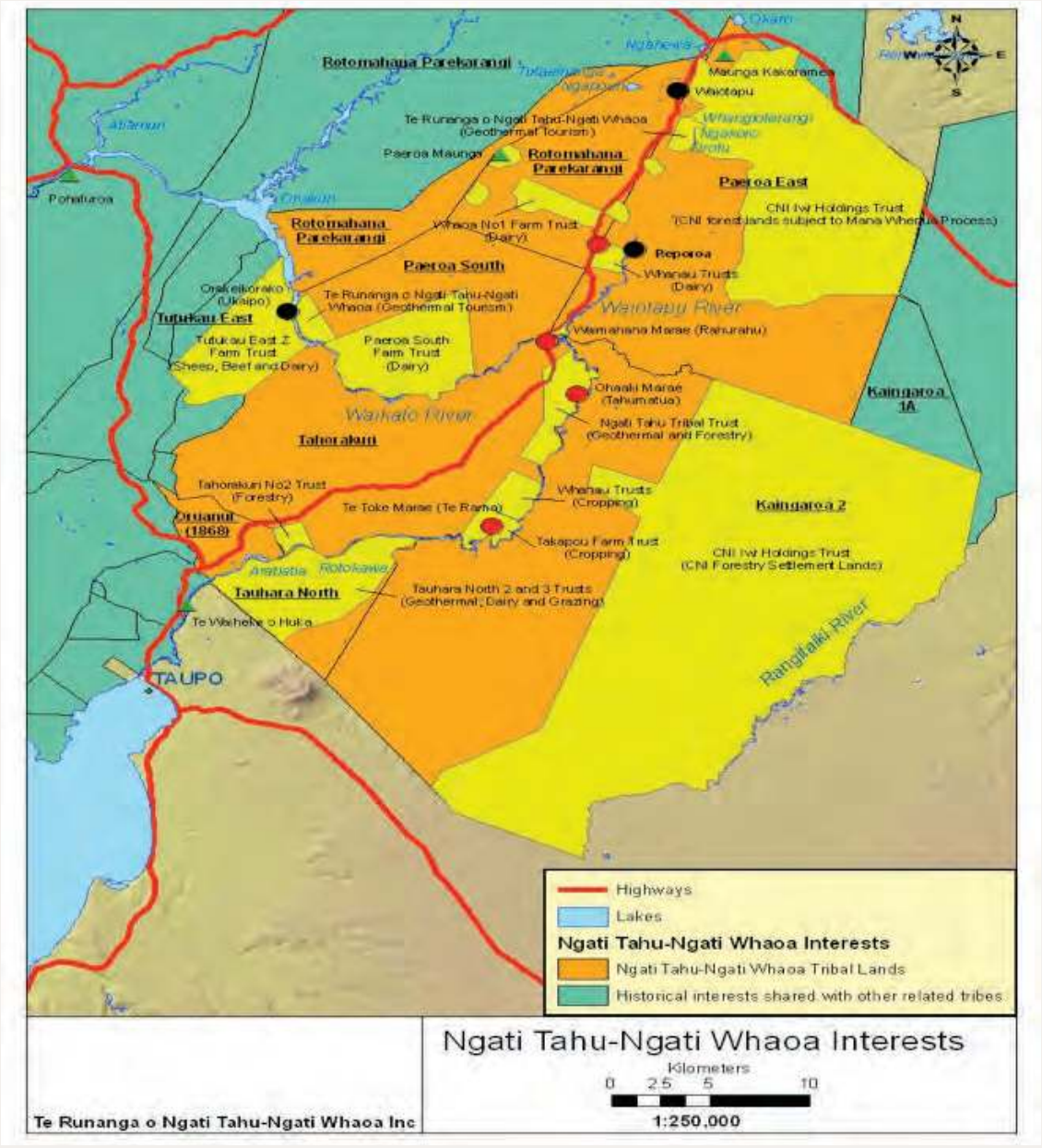
16

OUR ROHE

From Te Waiheke o Huka (Huka Falls) in the south, we extend east to our pouwhenua at Ngapuketerua beyond the Rangitaiki River, then northward across the plains of Kaingaroa to Wairapukao and further on to Pekepeke. From here we extend to our northern pouwhenua at Maunga Kakaramea, turning west to the Paeroa Range and on to Orakei Korako on the banks of the Waikato River, the birth place and principal papakainga of Ngati Tahu-Ngati Whaoa. From Orakei Korako we extend further west to Pohaturoa, an ancient pa site.

These are the pouwhenua, the geographical marker points that describe the rohe in which Ngati Tahu-Ngati Whaoa is recognised as an iwi with mana whenua. Comprehensive background to the iwi assertions of mana whenua can be found in the Deeds of Settlement and settlement legislation. (See below: History of the iwi and resources.) Map 1 shows the iwi traditional tribal lands and current iwi landholdings.

Map 1. Ngati Tahu-Ngati Whaoa traditional lands and current iwi landholdings

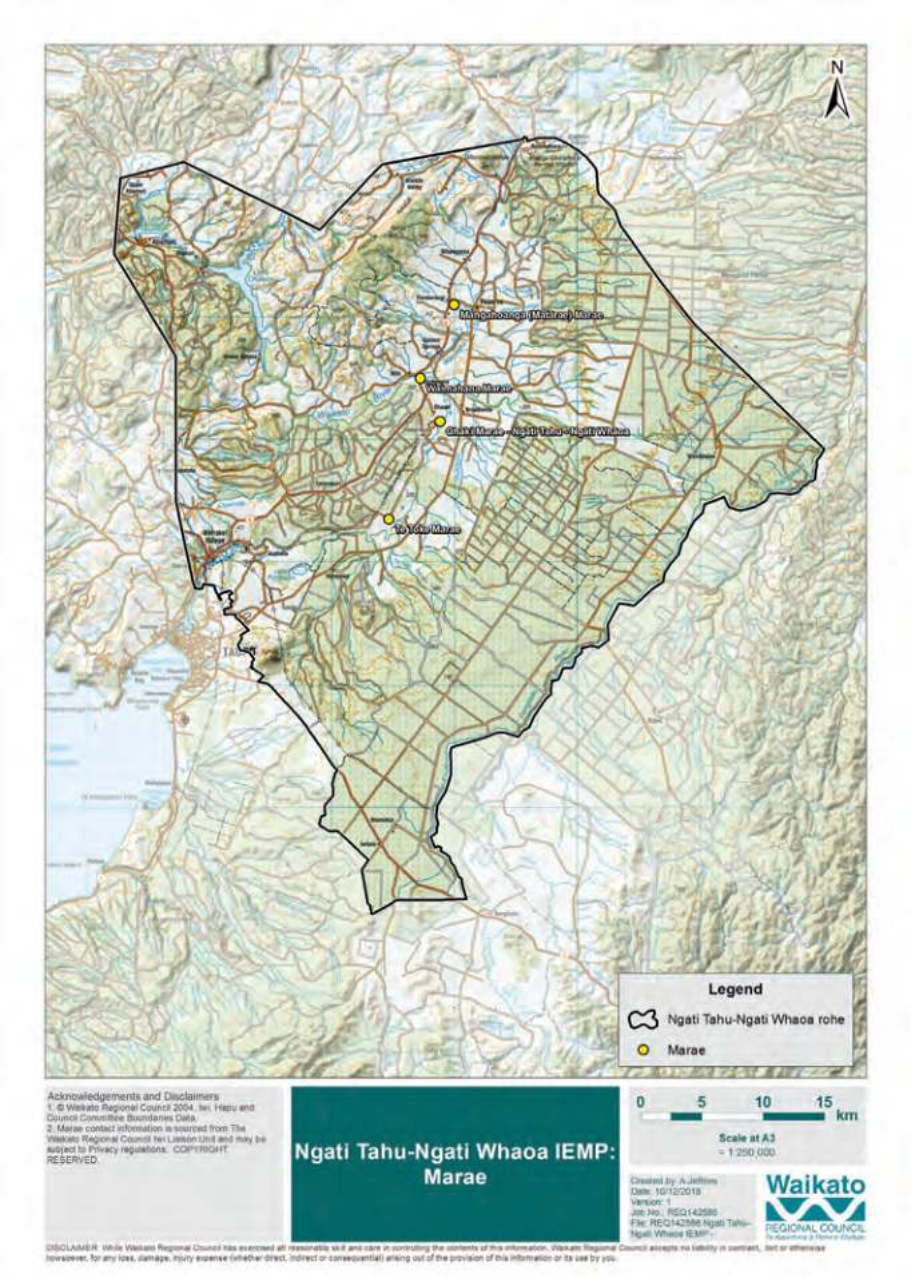


OVERVIEW OF ENVIRONMENTAL FEATURES OF OUR ROHE

Central to our identity is Orakei Korako, the original settlement and ukaipo of the iwi, a place of great significance to us. Here the iwi resided, alongside the ngawha, on the banks of the Waikato River – taonga that characterise the rohe of Ngati Tahu–Ngati Whaoa.

Ngati Tahu-Ngati Whaoa had many kainga, cultivations and burial caves along the edges of the Waikato River. Three of our four marae are situated along the Waikato River, the fourth marae being adjacent to Mangahoanga Stream, a tributary of the Waiotapu (see Map 2). The pristine headwaters of the Waikato River and its extensive wetlands provided the iwi with all we needed – pure water, abundant kai, and diverse resources and materials for our use.

Map 2: Marae of the Ngati Tahu–Ngati Whaoa rohe



The Waikato River settlement legislation has recognised and affirmed the significance to Ngati Tahu-Ngati Whaoa Iwi of the Waikato River from Huka Falls to Pohaturoa at Atiamuri (see box below and Map 4). Through Treaty Settlements entered into as part of Te Pumautanga o Te Arawa, Ngati Tahu-Ngati Whaoa has had customary lands returned. The iwi is also part of the Central North Island Forests settlement which passed into legislation in 2008. Ngati Tahu-Ngati Whaoa has been recognised as holding mana whenua interests in four of the nine blocks of the Kaingaroa Forest that were addressed through an independent adjudication panel.

Geothermal areas were favoured by our tupuna for settlements, providing precious warmth and hot bathing, natural cooking and preserving, and sites for ritual purposes and healing. Our iwi traded unique materials of the rohe such as kokowai, clay pigments generated by geothermal activity.

Ngati Tahu-Ngati Whaoa has an active role to play in kaitiakitanga over a number of geothermal fields within our rohe. Several iwi Trusts are landowners and joint venture partners in geothermal developments. Geothermal habitat also harbours some of the rarest plants in the country.

There are extensive forest areas in Tutukau and the Paeroa ranges that provide homes for plants and animals, healing rongoa, resources for cultural materials, and connections to the Waikato River. Our rohe was known for its freshwater resources, wetlands (repo), and birdlife associated with the water.

Wahi tapu and historic sites of significance to the iwi are found throughout the rohe, alongside the river and waterways, on high hilltops and in areas of native forest and pine forestry.

All of these taonga and more have great cultural significance to our iwi and we want to see them prosper under our care.

SIGNIFICANCE OF THE WAIKATO RIVER

The Deed in Relation to a Co-Management Framework for the Waikato River, signed between Te Arawa River Iwi and the Crown, 9th March 2010, sets out the statement of significance of the Waikato River to the Te Arawa River Iwi.

STATEMENT OF SIGNIFICANCE

The Waikato River flows from its source on the south side of Ruapehu to Te Puaha o Waikato (the mouth) and includes its waters, banks and beds (and all minerals under them) and its streams, waterways, tributaries, lakes, fisheries, vegetation, flood plains, wetlands, islands, springs, geothermal springs, water column, airspace, substratum and mauri.

The Waikato River and its catchment is a resource of great cultural, historical, traditional and spiritual significance to the people of Ngati Tahu-Ngati Whaoa, Ngati Kearoa Ngati Tuara and Tuhourangi Ngati Wahiao.

Our relationship with the Waikato River and its tributaries, and our respect for it, gives rise to our responsibilities to protect the River and all it encompasses, and to exercise our mana whakahaere in accordance with long established tikanga to ensure the wellbeing of the River.

We continue to exercise our mana, along with customary rights, and exert the rights and responsibilities of kaitiakitanga in relation to the Waikato Awa within our rohe.

HISTORY OF THE IWI AND RESOURCES

The following historical description is from the Deed in Relation to a Co-Management Framework for the Waikato River, signed between Te Arawa River Iwi and the Crown, 9th March 2010.

"OUR HISTORY"

Our people have occupied these lands since the arrival of our Tupuna Ariki Tahu Matua. Tahu Matua arrived here in Aotearoa before the arrival of the seven waka from Hawaiki. Our Tupuna Whaoa is some generations younger. Whaoa descends from Tahu Matua on his mother's side, Hinewai, and he descends from Atuamatua on his father's side, Paengatu.

As a tribe, we derive our name from our ancestors Tahu Matua and Whaoa. Through successive generations of inter-marriage with neighbouring iwi, our tribal members also trace descent from ancestors who arrived on the Arawa, Matatua and Tainui waka.

From the arrival of our Tupuna Ariki we have asserted and maintained mana whenua and mana whakahaere through continued ahi kāroa (occupation) and possession of our lands and taonga.

Prior to the arrival of European settlers to Aotearoa – New Zealand, Ngati Tahu-Ngati Whaoa was an autonomous, indepen-dent and self-governing confederation of hapū. These hapū included: Ngati Tahu, Ngati Karaka, Ngati Maru, Ngati Hinewai, Ngati Whaoa, Ngati Rahurahu, Ngati Matarae and Ngati Te Rama.

As Ngati Tahu-Ngati Whaoa we exercised tino rangatiratanga over our traditional rohe. The historical hapu no longer form distinct communities within Ngati Tahu-Ngati Whaoa. In more recent times the descendants of our many tūpuna have operated as a single tribal grouping known today as Ngati Tahu-Ngati Whaoa.

'OUR MARAE

Today, three of our Marae (Ohaki - Tahu Matua, Waimahana – Rahurahu and Te Toke – Te Rama) are situated on the banks of the Waikato River with Mangahoanga Marae – Matarae standing adjacent to the Mangahōanga stream. The Mangahoanga stream runs into the Waiotapu River, a major tributary of the Waikato River. The tribe has acknowledged our ancestor Whaoa by giving his name to the wharenui which stands on the school grounds of Reporoa College.

"OUR LANDS"

Ngati Tahu-Ngati Whaoa lands and resources were held in customary tenure where tribal collective custodianship remained paramount. In the exercise of our rangtiratanga the tribe sought to ensure that very little land within the Ngāti Tahu-Ngāti Whaoa rohe was permanently alienated.

As a tribe, Ngati Tahu – Ngati Whaoa was actively engaged in commerce and trade. Our people had seasonal kainga and cultivations spread throughout our traditional rohe capitalising on micro climates, diverse soils and winter and summer safe areas.

Ngati Tahu-Ngati Whaoa claim that prior to the establishment of the Native Land Court, we were essentially autonomous and economically prosperous. Our people produced and sold commodities such as cattle, pigs, duck, vegetables, wheat, oats, potatoes, flax and timber. Our people were also engaged in a range of commercial activities. Ngati Tahu-Ngati Whaoa used commodities such as red ochre, kereru, tuna, fish and minerals from our geothermal resources for customary trade with other iwi.

The Native Land Court was established under the Native Land Acts of 1862 and 1865 to determine the owners of Māori land "according to Native Custom" and to convert customary title into title derived from the Crown. The Crown's pre-emptive right of land purchase was also set aside, enabling Maori to lease and sell their lands with few restrictions. As was often the case in the 1860s there was limited consultation concerning this legislation, and the Crown did not specifically consult Ngati Tahu-Ngati Whaoa.

The Native Land Court awarded Ngati Tahu-Ngati Whaoa approximately 150,000 hectares (370,000 acres) and 80% of these lands fall within the Waikato River catchment.

Land blocks awarded by the Native Land Court, vesting sole ownership to Ngāti Tahu-Ngati Whaoa include:

Kaingaroa No.2 (October 1867), Paeroa South (September 1884), Tahorakurī (February 1887), Tauhara North (January 1869), Tutukau East (February 1886) and Rotomahana Parekārangi 3A (May 1882).

Land blocks awarded by the Native Land Court vesting dominant owner-ship to Ngāti Tahu-Ngāti Whaoa include:

Paeroa East (July 1881).

Land blocks awarded by the Native Land Court vesting shared owner-ship to Ngati Tahu-Ngati Whaoa along with other neighbouring tribes include:

Oruanui (February 1878).

Land blocks that Ngati Tahu-Ngati Whaoa have a historical customary association with include:

> ***Tutukau West, Tauri, Kaingaroa 1A, Hangihangi, part Kaingaroa No.1, part Rotomahana Parekarangi 6A, part Tatua West, and part Tatua East.***

Subsequent fragmentation and alienation of Ngati Tahu-Ngati Whaoa Lands contributed to the erosion of our traditional tribal structures,our economic independence and the social fabric of our tribe. Land loss caused great pain and grief to our people and a sense of that grievance was illustrated in a letter submitted to the Crown by Kamariera Heretaunga and 54 others. It reads:

"Great is the pain and grief afflicted us by reason of the Crown. The reason for our pain is that we do not call this land earth, but the flesh and bones of our dead. Gone are the burial sites, gone are the settlements, gone are the cultivations. Sir, great is our pain and grief". (Orakei Korako, 18 November 1895).

Ngati Tahu-Ngati Whaoa also lost land along the banks of the Waikato River due to takings under the Public Works Acts.

"OUR RESPONSIBILITY"

Ngati Tahu-Ngati Whaoa owns 4,500 hectares (11,000 acres) of land adjacent to the Waikato River between Te Waiheke o Huka and Pohaturoa. Land use across these blocks include: dairying, dry stock, cropping, forestry and geothermal energy generation. These blocks are currently administered by: Ngati Tahu Tribal Trust, Tauhara North Trusts, Through the Treaty settlements entered into as part of Te Pumautanga o Te Arawa and the Central North Island Iwi Collective, there is an opportunity for Ngati Tahu-Ngati Whaoa to have our customary lands returned making us one of the largest land owners in the Waikato River catchment.

Ngti Tahu-Ngati Whaoa is in a unique position of perpetual, inter-generational land ownership. Activities on the Waikato River and within its catchment continue to significantly impact on the health and wellbeing of the River. Ngati Tahu-Ngati Whaoa must play a leadership role in developing new initiatives focused on innovative land use techniques and technologies and River initiatives focused on cultural revitalisation.

"OUR GEOTHERMAL TAONGA"

Ngati Tahu-Ngati Whaoa has a historical, cultural and contemporary association with geothermal resources within our traditional rohe. Such resources were used for cooking, drinking, bathing and healing. Large kainga and cultivations were often established around these taonga such as at Orakei Korako, Ohaki and Waiotapu.

With the passing of the Geothermal Energy Act 1953, Ngati Tahu-Ngati Whaoa lost control of and access to some of our geothermal taonga.

The geothermal fields within our traditional rohe include:

Rotokawa (Tauhara North), Broadlands (Kaingaroa No.2), Ohaki (Tahorakuri), Nga Tamariki (Tahorakuri), Reporoa (Paeroa East), Waiotapu (Paeroa East), Waikite (Rotomahana Parekarangi), Te Kopia (Rotomahana Parekarangi), Orakei Korako (Tutukau) and Atiamuri (Tatua West).

"OUR AWA"

Ngati Tahu-Ngati Whaoa had many kainga, cultivations and burial caves along the banks of the Waikato River. The River provided many benefits to our people and was often used to transport produce that was traded with other Iwi and early settlers.

Paramount to Ngati Tahu-Ngati Whaoa is our participation in a co-management regime that protects, preserves and where possible restores our wahi tapu and taonga. From our perspective a co-management regime focused on the health and wellbeing of the Waikato River is one process by which to achieve our objective.

The close connection Ngati Tahu-Ngati Whaoa has with the Waikato River is illustrated by the significant number of places held sacred along the River from Te Waiheke o Huka to Pōhaturoa .

The Deed goes on to describe specific sites along the river. It also sets out some of the historical impacts on Te Arawa River Iwi due to the loss of land through the operation and impact of the native land laws, Crown and private purchasing of land, and alienations under Public Works legislation for a number of purposes, including electricity generation. The modification of the Waikato River and other impacts on it are described in the following box.

Ohaki 1969

MODIFICATION OF THE WAIKATO RIVER

From the 1920s, the Crown embarked on a series of major hydro-electricity developments that affected both the Waikato River, and the land adjacent to it. The first dam constructed by the Crown on the River was commissioned at Arapuni in 1929. In 1940 and 1941 control gates and a diversion channel were built at the Lake Taupo outlet in order to control and regulate the level of the lake. The periodic discharge of water through the control gates on the River caused flooding along the riverbanks downstream, and generated considerable public concern.

Following the construction of the Taupo control gates a series of major hydro-electric power stations were built over the next 30 years along the length of the Waikato River. The new stations were at Karapiro (built in 1940-47), Maraetai 1 (1946-52), Whakamaru (1949-56), Atiamuri (1953-58), Waipapa (1955-61), Ohakuri (1956-61), Aratiatia (1959-64), and Maraetai II (1959-61, 1967-70). The Upper Waikato River contains more dams than any other waterway in New Zealand.

As a result of the dam construction and associated flooding, many points of access and food-gathering places along the banks of the River were lost to the Te Arawa River Iwi. There was a significant loss of whare, pa, wahi tapu, urupa, sites of significance and other important areas to the Te Arawa River Iwi through the flooding associated with the hydro-electric developments. For example, the Ngaawapurua pa (occupied by Ngati Tahu-Ngati Whaoa) was flooded when the Ohakuri Dam was built and Motutahae (a pa located on an island in the Waikato River) is now submerged due to the construction of that dam.

Ohaki 1995

The dams and control gates have impeded the natural flow of the Waikato River, which has affected the mauri of the River.

Specific geothermal sites around the Waikato River, which were of significance to the Te Arawa River Iwi, were also affected by the construction of electricity generation facilities along the Waikato River. Many of the geothermal sites that were once used in day-to-day life by Ngati Tahu-Ngati Whaoa were destroyed or adversely affected by the flooding associated with those facilities.

Orakei Korako and Ohaki are two of the sites that were adversely affected by the flooding of the area. Orakei Korako was a principal settlement of the Ngati Tahu-Ngati Whaoa people for centuries. Three quarters of the geysers and hot springs at Orakei Korako were flooded and road access cut off when the Ohakuri dam was completed in 1960, and when it was filled on January 1961. The last of the Ngati Tahu-Ngati Whaoa people living at Orakei Korako were moved from their homes to Taupo. Prior to moving, these families witnessed their homes being burnt to the ground to clear the area in readiness for flooding by the construction of the Ohakuri dam.

The commissioning of the Ohaki geothermal power station produced significant environmental effects, including subsidence leading to flooding. This continues to threaten many treasured taonga including the Ohaki Marae, urupa and wahi tapu. The Ohaki Ngawha (hot pool) was at one time the largest natural boiling hot pool in the southern hemisphere. When development commenced, the extraction of geothermal fluid made the water level in the Ohaki Ngawha drop causing significant damage.

The ngawha is now fed by geothermal bore water, which contains chemicals added to prevent silica depositing in the bore pipes. Most of the other flowing surface features at Ohaki have dried up because of the extraction of geothermal fluid.

These modifications to the Waikato River, loss of associated geothermal resources, and the displacement of people have caused considerable distress to the Te Arawa River Iwi.

OTHER IMPACTS ON THE WAIKATO RIVER

There have been other significant alterations to the ecology of the Upper Waikato River. These impacts were caused by the establishment of major exotic forest plantations and associated processing plants; the clearance of native vegetation and the rapid expansion of the dairy industry; rural residential expansion; the draining of wetlands and discharges into waterways; domestic and industrial abstraction of water from the River; and, industrial development including the construction of geothermal power stations at Wairakei and Ohaki.

Through the historical changes to the natural environment, many taonga of the iwi have been alienated, destroyed or lost, or have suffered a decline in condition or health. On the haerenga organised for kaumatua to prepare this Iwi Environmental Management Plan, kaumatua noted how things have changed. In the past they had never had concerns about where their kai came from, but now they worry about where they collect kai and how safe it is to eat.

Ka ora te iwi
Ka ora te tangata

Well-being for the tribe, well-being for the people.

CURRENT LAND OWNERSHIP

The 4,500 hectares (11,000 acres) of land owned by the iwi adjacent to the Waikato River represents 3% of the original landholdings awarded to Ngati Tahu-Ngati Whaoa by the Native Land Court.

These blocks (see Map 1) are currently administered by:

- **Ngati Tahu Tribal Trust**
- **Tahorakuri Forest Trust**
- **Takapou Farm Trust**
- **Tauhara North Trusts**
- **Paeroa South Farm Trust**
- **Tutukau East Z Farm Trust.**

The iwi has also had lands returned through settlement of the claims of Te Pumautanga o Te Arawa. Areas of land returned are located at Orakei Korako, on the Paeroa Range and at Waiotapu. Two of these areas (Wai-o-Tapu and Paeroa Range – Ruatihi o Paeroa) are owned by Ngati Tahu-Ngati Whaoa Runanga Trust and managed as Scenic Reserves by the Trustees.

While not in iwi ownership, other land within the DOC estate has been acknowledged through settlement processes as being of particular significance to the iwi. Maunga Kakaramea is one such place, recognised as an important site to the iwi due to ahi ka roa (enduring relationship and occupation), and as such requiring DOC to work with the iwi on its management. This is achieved under the protocol that the Runanga has with DOC outlining how they will work together on all mahi within the Department's mandate.

Further information on land and resources can be found with Part II of this plan, along with maps of important features.

CO-MANAGEMENT OF THE WAIKATO RIVER

Ngati Tahu-Ngati Whaoa participates in co-management of Te Awa o Waikato through our affiliation to the Te Arawa River Iwi Trust (TARIT). TARIT was established through the settlement of historical claims for Te Pumautanga o Te Arawa. Under the Te Pumautanga Settlement Deed (11 June 2008), the Crown recognised the interests of our iwi in the Waikato River and its environs, from Huka Falls to Pohaturoa. This was in response to the Wai 217-Waikato River (Atiamuri-Huka) Claim being lodged by our kaumatua early in the claims process. TARIT's role is to assist in the empowerment of our people to assert mana whenua over all waterways within our rohe pertaining to the Waikato River through legislation and approaches such as Joint Management Agreements (JMAs) and Accords.

The area covered by TARIT, including those of the two other affiliates, is shown in Map 3, along with the boundaries of the Ngati Tahu-Ngati Whaoa rohe.

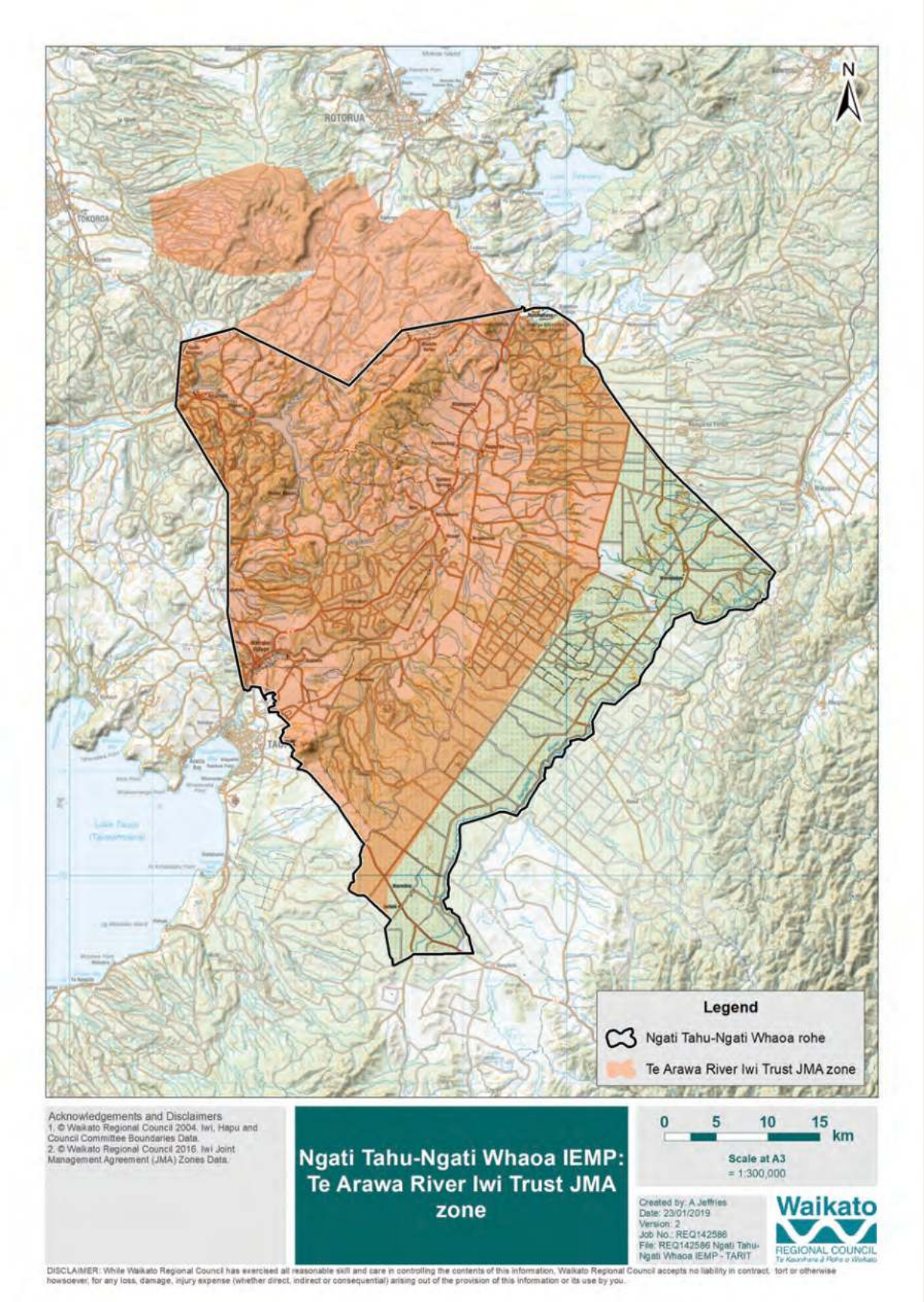
TE ARAWA RIVER IWI TRUST (TARIT) REPRESENTS

Ngati Tahu-Ngati Whaoa, whose tribal boundaries lie between Te Waiheke o Huka (Huka Falls) and Pohaturoa at Atiamuri and extends to the Kainga-roa Plains

Tuhourangi -Ngati Wahiao whose lands include the Rotomahana Parekārangi block and the Whirinaki Stream, which forms Lake Ohakurī

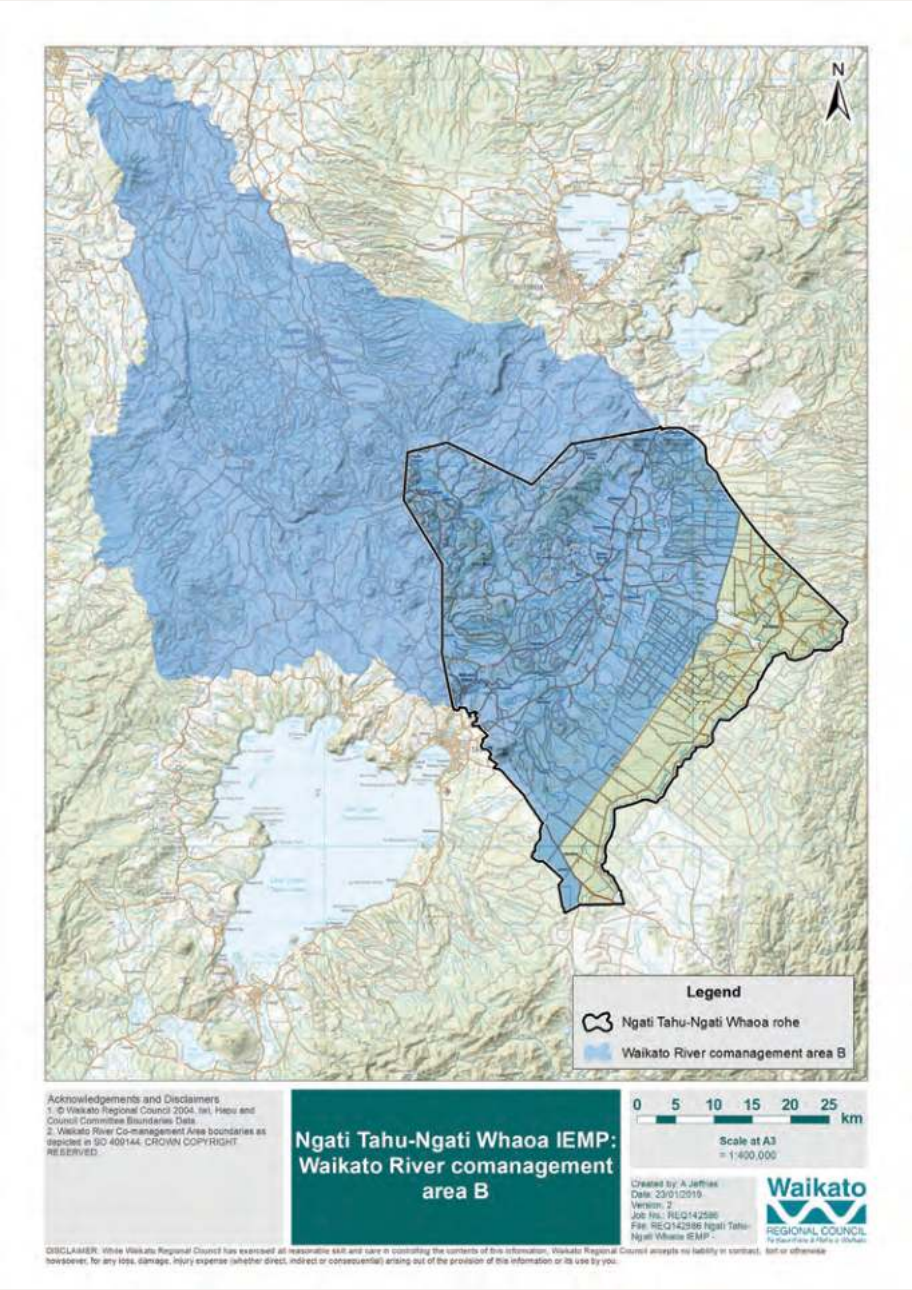
Ngati Kearoa Ngati Tuara, whose traditional lands include Horohoro and their principal waterway is the Pokaitū stream just north of Pohaturoa.

Map 3: Te Arawa River Iwi Trust boundary and Ngati Tahu–Ngati Whaoa rohe



The Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010 recognises the iwi of the upper river in co-management arrangements for the Waikato River, in particular for Co-management Area B (see Map 4).

Map 4: Co-management areas under the settlement legislation for the Waikato River



In October 2010 the Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010 was enacted to provide legislative recognition of the co-management deeds between the Upper Waikato River iwi and the Crown.

The Act sets in place processes for achieving the primary direction-setting document for the Waikato River: The Vision and Strategy for the Waikato River (Te Ture Whaimana o te Awa o Waikato). The Vision is as follows:

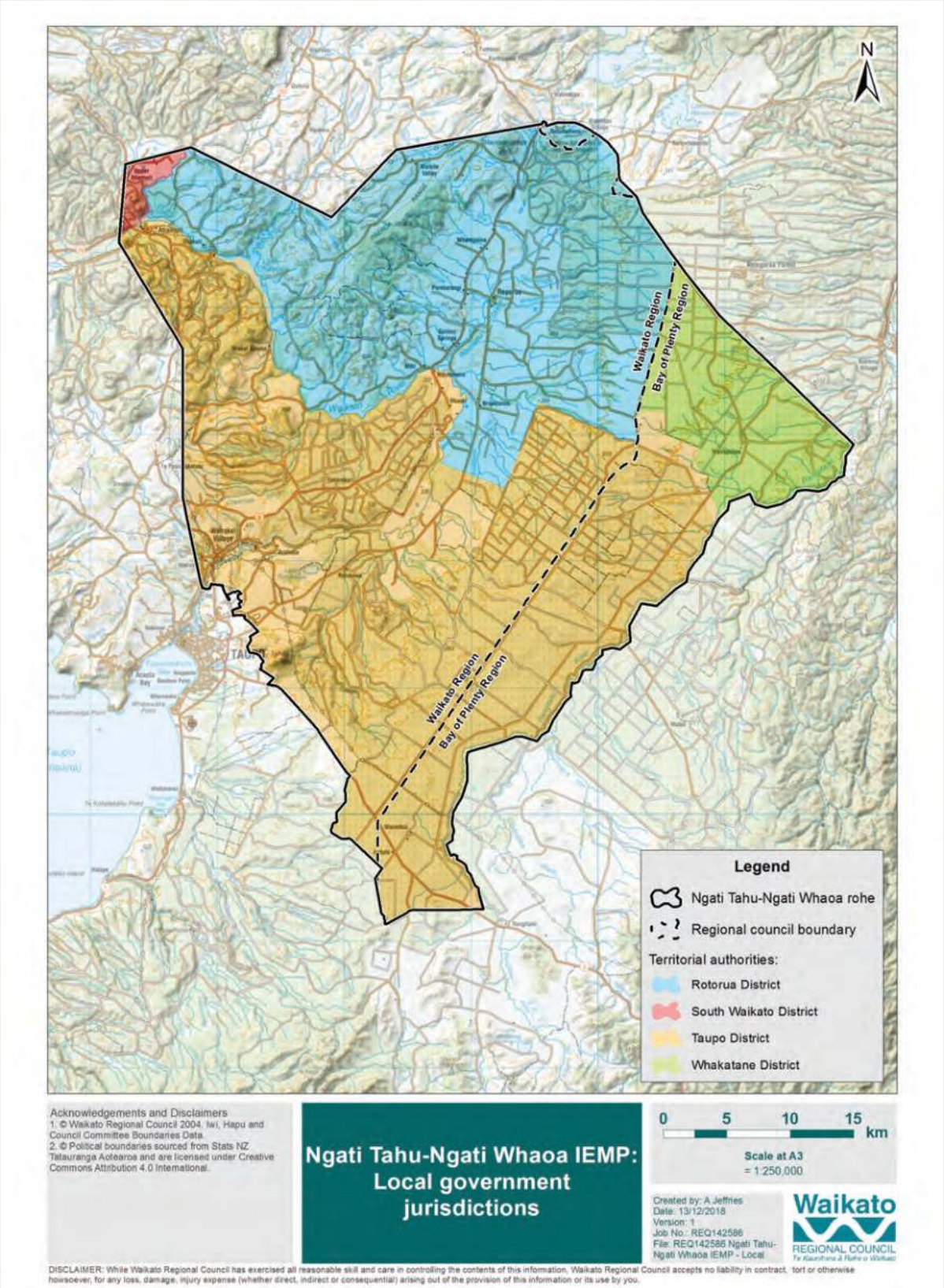
> ***"Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come."***

The Vision and Strategy in its entirety is deemed to be part of the Waikato Regional Policy Statement,

and will prevail over any inconsistent provision in the Waikato Regional Policy Statement, any National Policy Statement and any New Zealand Coastal Policy Statement.

The settlement legislation also requires that TARIT develop and implement Joint Management Agreements (JMAs) with local government (see Map 5) and Accords with Crown Ministries. JMAs present an opportunity for TARIT to act as a communication vessel between local government and the affiliates on resource management decision making, plans and projects that may have an impact on the River. Accords present the same opportunity for TARIT, on behalf of and in consultation with the affiliates, to engage with central government on policy and legislation, understanding of our cultural values and perspectives and potential projects where they may impact the River.

Map 5: Ngati Tahu–Ngati Whaoa rohe and local government boundaries



TARIT also has a role to create plans such as its Fisheries Plan published in 2015, and to implement Accords through Accord Implementation Plans with Crown Ministries overseeing relevant areas such as conservation, fisheries and culture and heritage.

TARIT is enabled by legislation to take part in these arrangements with central and local government on behalf of their affiliate iwi for the purposes of co-management of Te Awa o Waikato. However, the underlying aim is for the affiliate iwi to be empowered to enact their own roles in kaitiakitanga of the wai within their rohe. Opportunities should be provided for iwi affiliate representatives to participate in these discussions, in order to build capacity within the affiliate iwi.

Regardless of the role of TARIT, Ngati Tahu-Ngati Whaoa regularly engage directly with central and local government where input is required and decisions are being made which may impact our resources. For all decisions being made under the Resource Management Act, the Conservation Act and other relevant statutes which may apply, direct contact should be made with the Ngati Tahu-Ngati Whaoa Runanga Trust, as the relevant iwi authority for Ngati Tahu-Ngati Whaoa, the iwi holding mana whenua in this rohe.

MANA WHENUA INTERESTS IN CENTRAL NORTH ISLAND FORESTS

The rohe of the iwi extends eastward into the Rangitaiki catchment, and the iwi has a historical relationship with areas within the Kaingaroa forest lands. The Runanga has taken part in the process of determining mana whenua over the Kaingaroa forest blocks, known as Crown Forest Lands (CFL). An independent adjudication panel determined that of the nine CFL it was asked to consider, Ngati Tahu-Ngati Whaoa have a substantive interest in two (the Wairapukao and Reporoa CFL blocks), and a limited interest in a further two (the Totara and Headquarters CFL blocks). For further information, see the snapshot in the Recognition and representation section, and Map 15 in Part II.

ENGAGEMENT WITH RESOURCE USE APPLICATIONS AND CONSENTS

Enhancement, restoration and protection of our environmental and cultural values are an important focus of this plan. One aspect of achieving this is through our involvement in district and regional resource consent processes as well as through concession and permit applications with central government agencies. As the iwi authority within our rohe, the Ngati Tahu-Ngati Whaoa Runanga Trust strives to maintain a strong working relationship with local industries, farmers, stakeholders and community. We encourage early engagement from applicants so we can share our values and expectations, and raise awareness of any environmental and cultural concerns regarding the planned activities. This allows for robust communication and ensures both parties are aware of any potential concerns that the other may have at the initial stages of the project. Early engagement provides the maximum opportunity for open korero and a sound process to work through any concerns.

We desire to protect and improve management of our resources through development of positive relationships with agencies and applicants. Where these relationships have not yet been established, we encourage regional and district councils and central government agencies to provide our contact details to applicants, so the engagement process can begin at an early stage. It is critical that this occurs before any resource consent or permit application has been formulated and lodged, in order to enable positive dialogue to work through any issues. We believe following this process will help us navigate our way forward to shape a more sustainable future for our resources.

CURRENT RESOURCE CONDITION AND OPPORTUNITIES

This is a summary of the current condition of resources in the rohe, and some key opportunities for improvement. For more detailed information for each resource, see Part II of this plan.

Prized geothermal features of the iwi have been degraded by past developments for hydro- and geothermal generation that have exploited the resources of the rohe without benefit to the iwi. Iwi Trusts are now partners in new developments that seek to use the geothermal resources carefully, implementing best practice. There are opportunities to enhance iwi enjoyment of geothermal areas, provide greater protection for special geothermal features and habitats, and investigate a greater range of local uses for the geothermal resource.

The clear water of the Waikato River leaving Taupo becomes gradually degraded as it flows through the rohe of Ngati Tahu-Ngati Whaoa, although it is still considered to have high water quality by regional standards. The decline in clarity is due to algae growing in the impounded waters of the hydro-dams, fed by nutrients lost from the surrounding pasture and flowing through groundwater. The dams also form a disruption to migration, impacting on tuna populations. Tuna can only reach the upper catchment if they are physically transferred over the dams, and they cannot migrate downstream as adults. Current knowledge of what affects freshwater kai species are described in the

Photo: Alton Perie

booklet *Mahinga Kai: Ngati Tahu-Ngati Whaoa Story.* The main Waikato River has low levels of faecal microbes, because they settle out or are destroyed by UV light in the shallow water of the hydro-lakes. Some tributaries have higher levels of faecal contaminants. Geothermal tributaries and the main river are affected by elevated levels of arsenic and mercury. These toxins contaminate the bed sediments and can accumulate in kai species. Water quality is high in the upper reaches of the Rangitaiki where plantation forestry is the land use, but there are few native fish in these headwater streams. Downstream dams also affect the Rangitaiki catchment.

Along with the hydro-dams, various infrastructure such as water intakes, power lines and tourism developments have modified the aesthetic nature of the Waikato River within our rohe. Development of structures can encroach on the beauty and majestic nature and essence of the Waikato River.

According to WRC's assessment of water availability, the Upper Waikato River has reached its maximum water allocation, and the Reporoa basin groundwater is approaching full allocation. In the Rangitaiki, the total volume of water allocated to water users through consents has reached or exceeded the regional default thresholds for most of the catchment. The system does not currently allow for an iwi allocation.

The rohe has a number of freshwater lakes which shelter rare plants and wetland birds around their margins. However, their water quality is generally degraded by sediment and nutrients entering the water, and most lakes in the rohe have little native aquatic vegetation left and limited mahinga kai resources. Restoration projects are underway at a number of lakes in the rohe. There are several lakes located within geothermal areas which are influenced by the surrounding ngawha. These lakes are valuable for their unique characteristics such as acidity and chemical composition. Their margins also support many rare geothermally influenced plants.

In terms of opportunities for improving water resources, trying to find ways to restore a greater abundance of kai species and re-create migration pathways for tuna are challenges for the future. Key current opportunities to enhance the condition of waterways are to exclude stock and restore riparian vegetation using native species, including those with traditional cultural uses. Retiring headwaters, gullies and streambanks will also protect the sites most vulnerable to erosion in this pumice country, and this can allow for more intensive production on remaining land. However, further improvements to water quality will only come from managing nutrients carefully on farms and/ or expanding the area of the catchment under tree cover. Changes to the Waikato Regional Plan (Healthy Rivers Wai Ora) offer an opportunity for farm planning and management to enhance water quality within the rohe, and downstream. Further opportunities will arise as implementation occurs of the *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa* (produced by the Waikato Regional Council, DairyNZ and the Waikato River Authority).

Current iwi landholdings are around 3% of the tribal area originally recognised by the Maori Land Court. There is a mix of land use on iwi blocks, and across the rohe. Large areas of the Central North Island (CNI) forests in Kaingaroa are being returned to a number of iwi through the CNI negotiation process. In recent years the once extensive exotic forests in the upper Waikato catchment have been cleared for agricultural development. There is a tension for the iwi as landowners, between converting further area from pine to pasture for economic gain, and retaining the pristine water of the upper Waikato and Rangitaiki Rivers. Deforestation also has impacts for the emission of gases linked to global climate change and the hydrology of the upper Waikato catchment.

On the land, there are opportunities to work with forestry companies, farmers and DOC to ensure significant sites and wahi tapu are managed in accordance with the tikanga of the iwi, and to enhance natural areas across the rohe. Further work can also take place to revive and share historical knowledge, strengthening iwi identity and enriching visitors' experiences. Marae can be centres for ongoing learning for the iwi, with fun and engaging activities for whanau. Sustainable employment and enabling papakainga development will allow for opportunities for those whanau who want to return.

The rohe only has about 7% of its original native vegetation left, and the health of flora and fauna is impacted by pest plants and animals. However, there are still extensive tracts of indigenous forest in the Paeroa Ranges and Tutukau/Orakei Korako blocks. Some rare plants found in the rohe include pua o te reinga (*Dactylanthus*) and many species that inhabit geothermal habitats. Further opportunities can be sought to replant more areas in native vegetation and to extend or re-create wetlands. There are also the possibilities of reviving traditional knowledge and gaining further access to species for cultural use. Information could be gathered on tracks used by the tupuna, and traditional resource-gathering could be practised so that rangatahi can share in the natural and cultural heritage of the iwi. The condition of natural areas can be improved by controlling weeds (e.g. wilding pine in geothermal environments and willow in wetlands), and employment can be created by putting iwi skills in pest control to use.

PUMANAWA, WHAKANGAKAUTANGA, UARA - VISION, ASPIRATIONS, VALUES

This section outlines the vision for the Iwi Environmental Management Plan, aspirations for the care of our natural taonga, and values that underpin our management ethos for all the resources in our rohe. These are summarised in the picture that follows.

Pumanawa -Vision

Our vision is:

Hauora:	Health, life and well-being:
Taiao ora – Whanau ora – Mauri ora!	Flourishing nature - thriving families - the essence of vitality

Whakangakautanga - Aspirations

The following are iwi aspirations regarding environmental management:

- **To begin the process of restoration,** to see no further harm done to the environment in our lifetime, and to leave our taonga in better condition than when we received them
- **To see resources managed in accordance with the tikanga of our iwi**, to protect the mana and the tapu of the natural world
- **To generate opportunities for the Ngati Tahu-Ngati Whaoa iwi**, without development causing detriment to the environment
- **To see the iwi fully involved** in caring for, learning about, and managing our taonga in an inter-generational way
- **To see people enjoying places under our management**, gaining insights into the relationship that Ngati Tahu-Ngati Whaoa have with the land and a better understanding of our history
- **To establish good working relationships with others**, where the mana of each party is respected, and the role of Ngati Tahu-Ngati Whaoa in terms of kaitiakitanga, rangatiratanga and mana whakahaere is upheld and enacted.

Kaitiakitanga – Ahi ka roa – Mana whenua - Mana whakahaere

Ngati Tahu-Ngati Whaoa have customary interests and rights over resources in the area, and also uphold kaitiakitanga - responsibilities to care for the natural taonga of the rohe.

Customary interests arise because our tupuna managed and used these resources over centuries, due to our ahi ka roa (enduring occupation) giving rise to mana whenua (status within our lands).

These rights were not extinguished when European settlers arrived; indeed, Te Tiriti o Waitangi acknowledges and guarantees tino rangatiratanga (self-governance) over our natural resources, and therefore our mana whenua remains.

In applying mana whenua and kaitiakitanga, Ngati Tahu-Ngati Whaoa aims to manage resources with the approach of a respectful caregiver, so that they may continue to flourish and be available for future generations. This encompasses exerting our mana whakahaere – our authority to manage and exercise our rights and responsibilities - to achieve environmental enhancement, appropriate use, and cultural health through practices guided by our tikanga. This is not an exploitative and exclusive form of leadership, but a responsible and inclusive one, so that all may benefit.

Commercialisation of taonga in our rohe requires a discussion with Ngati Tahu-Ngati Whaoa. If the iwi has agreed to scientific research or exploration, this does not imply the right to develop or commercialise resources within our boundaries. If commercial gain is to be made from natural resources, the customary rights and interest of iwi must be addressed. If management decisions are to be made about natural resources, Ngati Tahu-Ngati Whaoa must be part of the governance decisions about those resources.

Uara - Values

These are our values:

- Matauranga mo te katoa: Education for all
- Kotahitanga: Unity
- Tino rangatiratanga: Self-governance
- Whakapumautanga: Sustainability
- Te matauria ki te whai whiwhi ki nga rawa taiao: Knowing and accessing resources
- Me whai panga te iwi ki nga huarahi mahorahora: Open processes that involve the iwi
- Ma te tauira te tauhoutanga me te manukuratanga: Innovation and leadership by example

Matauranga mo te katoa: Education and knowledge for all

Education and knowledge are key to managing our resources well. We believe it is important for members of the iwi of all ages to share in this learning. By identifying job and training opportunities and building the capability of our tamariki/ rangatahi they will be well prepared for mahi in the future. This value also applies to sharing knowledge across agencies to identify how best to care for our environment together.

Kotahitanga: Unity

Kotahitanga is about all working together – men and women, young and old - for the benefit of the whole iwi, now and in the future. Through this tautoko and manaakitanga we strengthen our bonds of whanaungatanga and whakapapa, and can stand strong as tangata whenua of the rohe. Kotahitanga refers to the Runanga working alongside the land Trusts to share and support best practices. It is also the way we want to work collectively with others beyond our iwi – building robust relationships to advance the protection of the environment and its many values. This could involve collaborative approaches and projects to minimise pollution and restore the environment, for example working with councils, landowners, schools and the whole community.

Tino rangatiratanga: Self-governance

Tino rangatiratanga refers to the iwi having and exercising authority over natural resources. Models and practices for managing resources will reflect who we are, and incorporate our tikanga. Our mana whenua will be upheld and respected. Our history and culture will be reflected with integrity.

Whakapumautanga: Sustainability

A value we hold for our taonga is to see resources cared for, used and restored in a way that not only maintains them, but enhances them for future generations. We want to see expanding areas of native forest and wetlands, abundant kai and rongoa species, and flora and fauna in increasingly good health. For this to occur we need to have a holistic and long-term perspective, avoiding effects that will be irreversible and preserving opportunities for our mokopuna. We want to avoid the use of toxic substances where possible. We need to think and work in a way that recognises and reflects interconnections in the natural world, and respects the tapu and mauri of all beings and natural elements of the rohe.

Te matauria ki te whai whiwhi ki ngā rawa taiao: Knowing and accessing resources

We value having easy access to the resources of our rohe, so that we can make everyday use of our taonga tuku iho (treasures handed down). We need to know what we have and what condition it is in. We want to be able to freely access and use our traditional ngawha, kai, rongoa and other resources. Development should not place any further constraints on iwi access to resources. We need flourishing and healthy mahinga kai so we can provide for our whanau, host manuwhiri and serve traditional kai at hakari. We need mobility so that we can reach our resources on land and on water. By direct involvement in using our resources and by taking part in projects and workshops, the iwi becomes reconnected to the whenua, with more awareness of our natural world and what it offers us as a people.

Me whai panga te iwi ki nga huarahi mahorahora: Open processes that involve the iwi

Transparent and open processes will create greater trust and understanding. We would like to model these processes and also see others do the same. This includes early consultation with us, in good faith, when changes or developments are first being considered. We ourselves want to make sure our rangatahi understand and become involved in managing resources, and we need to plan for succession in key roles in the iwi. We want to see cyclic processes where review feeds into further planning, and open communication and management processes create sustainable outcomes.

Ma te tauira te tauhoutanga me te manukuratanga: Innovation and leadership by example

This value reflects our desire to be leaders in environmental management. We want to innovate, and not be afraid to try new pathways. We value the leadership of our kaumatua. And we believe our young people, our rangatahi, are great innovators and we want to support their leadership also.

Kia kaha tatou mo ake ake ake!

Ara - Approaches to strengthen resource management across the rohe for all resources

Specific principles and actions are identified for each resource in Parts II and III of this plan. In this section, for the whole rohe, three key approaches are identified that apply across all resources. The approaches are:

Recognition and representation - reflecting mana whenua/ mana wai and the ahi ka roa (enduring occupation) of the iwi in this rohe.

Positive relationships – that are proactive, collaborative and encouraging, characterised by listening and sharing information, regular communication and action/ follow-up.

Engaging rangatahi – to strengthen connections and identity with the rohe, and to build skills so youth can take on active roles in managing resources.

The following tables set out recommended pathways to progress these approaches

Approach: Recognition and representation

PATHWAYS	Who does this involve?
Recognition of Ngati Tahu-Ngati Whaoa through any future negotiations on rights and interests in water (including geothermal fluid), land, forests and other taonga within the rohe.	Central government
Direct consultation with the iwi (through direct contact with the Ngati Tahu-Ngati Whaoa Runanga Trust or TARIT referral on to affiliate iwi holding mana whenua) on plans and operational matters pertaining to the rohe including regional and district plans, policies, strategies, priorities, projects, work-plans, consents, mining permits, commercial and recreational concessions and compliance monitoring.	Central and local government, TARIT
Identifying further opportunities for iwi members to be involved in enforcement action where there is environmental non-compliance.	Runanga with relevant authorities; TARIT (JMAs)
Recognition of the mana whenua of Ngati Tahu-Ngati Whaoa by major resource users operating in the rohe through consents, mitigation, and working parties (applies to geothermal, hydro, farming and agricultural processing, forestry and fertiliser industries, and any other developments in future).	Developers/ resource users Facilitated through councils
Consultation with both iwi if an activity is located on a boundary or where there are overlapping mana whenua claims.	Central and local government Developers/ resource users Neighbouring iwi
Representation (via TARIT) on co-management decision making pertaining to the Waikato River and the Vision and Strategy – 50:50 Crown: iwi or Council: iwi – as set out in settlement legislation and Joint Management Agreements.	Waikato Regional Council Waikato River Authority TARIT Runanga and iwi members
Representation in forum discussions involved with planning for and managing the Rangitaiki catchment.	Bay of Plenty Regional Council and Whakatane District Council Iwi of the Rangitaiki Runanga and iwi members
More iwi members undertaking Environmental Commissioner training so they can act on hearings committees.	TARIT Runanga and iwi members
Develop further iwi protocols and procedures to enhance the inclusion of iwi perspectives into resource management e.g. process and procedure manual, managing resource consents manual, populating the wahi tapu/ significant sites register.	Runanga

Approach: Positive relationships

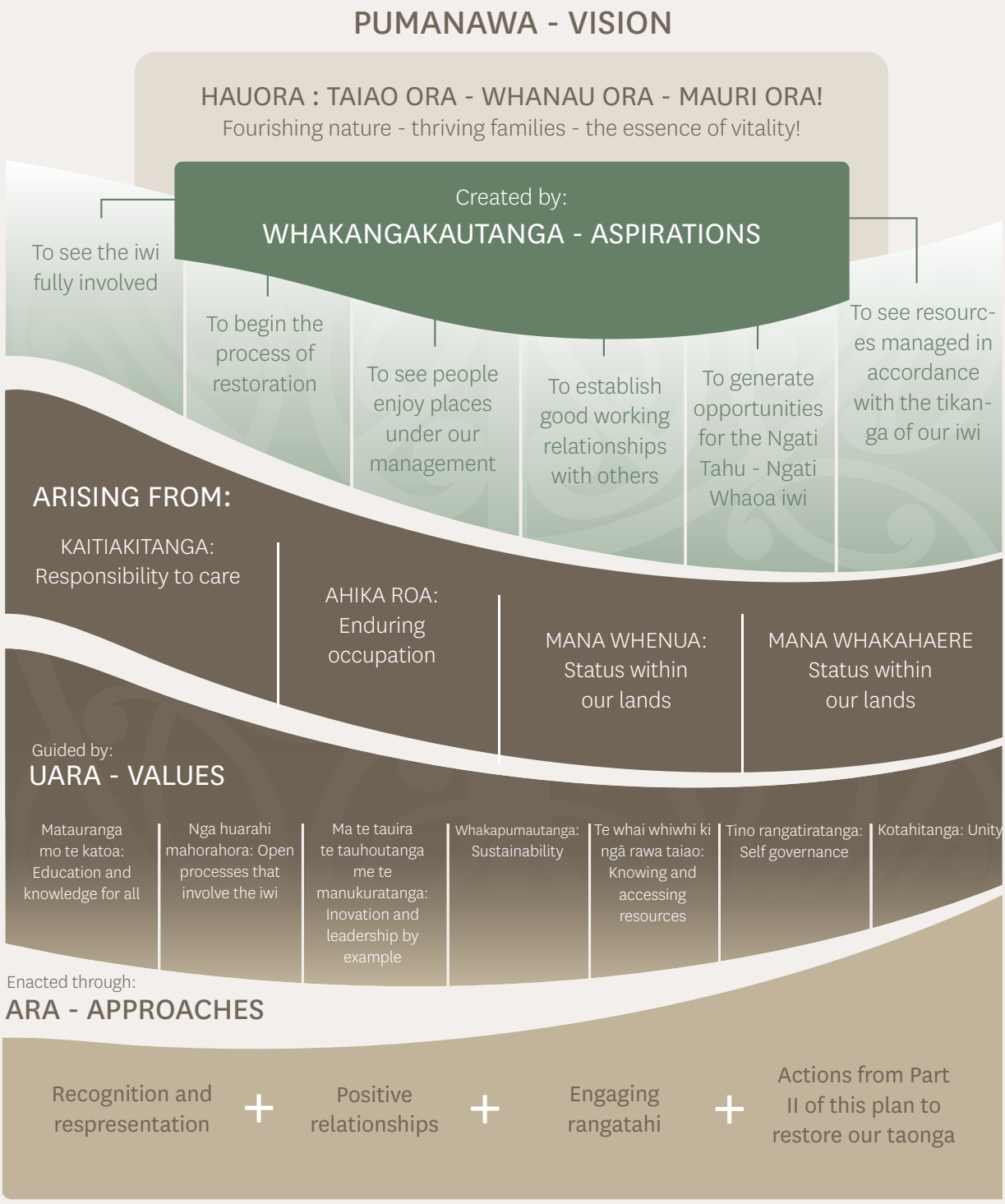
PATHWAYS	Who does this involve?
Undertake restoration projects together to build relationships, understand each other's values and identify common interests. Utilise existing funding and partnerships to leverage new initiatives. Engage and upskill iwi members and involve rangatahi.	Runanga, iwi members and project partners
Enact early consultation, and, where appropriate, active collaboration to ensure iwi are informed about, and benefit from local projects. Pre-consultation is encouraged before consent applications are lodged, to build trust and show transparency of intent. This may need to include local marae, land Trusts and whanau, which the Runanga can guide. Resourcing for iwi members' time and expertise should be considered. Note: consultation is not satisfied by an initial discussion; the views of the iwi should be included as the project is further developed.	Central and local government Developers/ applicants Non-government and community groups Scientists and researchers Runanga and land Trusts, whanau and iwi members TARIT
Build capacity by developing iwi members' skills to be involved in environmental projects in the rohe (such as researching, project planning and grant-seeking, restoration and conservation skills etc).	Runanga and iwi members Central and local government Training providers and science organisations TARIT
Continue to develop the working relationship with DOC in the rohe based on the current MOU – including input on an annual basis to work-plans in the rohe and a collaborative approach to major projects.	Runanga DOC
Create active involvement in state-of-the-environment monitoring of fisheries, flora, and fauna and resources to foster reconnection – including TARIT projects for water quality monitoring.	Runanga and iwi members TARIT Regional councils
Foster good relationships with other resource users, large forestry companies, and major agricultural operations in the rohe. Develop and implement protocols, working documents, relationship agreements or MOU where relevant to achieve aspirations and goals.	Runanga Developers/ resource users Forestry companies Agricultural operations
Foster good relationships with the local community to increase awareness and understanding, participation and partnership.	Runanga and iwi members Local community
Reinforce communication lines with TARIT, to be agreed and flowing freely at both staff-to-staff level and governance (Trustee) level – including a written protocol if appropriate.	Runanga TARIT

Work collaboratively and share information with other TARIT affiliates as appropriate, and support each other's independent work on specific matters for each rohe. Identify issues within overlapping rohe with other iwi, e.g. for tributaries of the Waikato River and in the Rangitaiki - where applicable develop joint projects. Show respect towards each other and the unique relationship each iwi has with the environment. Develop rules of engagement and/or protocols.	Runanga Tuhourangi Ngati Wahiao Ngati Kearoa Ngati Tuara Other neighbouring iwi TARIT
Strengthen relationships and communication between the Runanga and the independent land Trusts while respecting autonomy.	Runanga Land Trusts
Establish a Forum (or several) for sharing resource information and planning future projects as an iwi. These could be resource-specific e.g. geothermal, or land and water, or for general planning as an iwi.	Runanga with land Trusts and iwi members and support from relevant agencies

Approach: Engaging rangatahi

PATHWAYS	Who does this involve?
Engage rangatahi early with the natural world, sciences and matauranga, to nurture their interest and natural curiosity.	Runanga with project partners
Continue rangatahi involvement in iwi projects e.g. tuna workshops, IEMP review hui.	Runanga with project partners
Continue building the relationship with local schools, involving students in projects that will enhance their learning and grow leaders within the iwi, within the community. Contribute to other programmes endorsed by schools.	Runanga with local schools and other partners
Hold camps, education programmes, celebrations and activities to strengthen identity and connection for rangatahi e.g. marae-based education, cooking and bathing in ngawha, collecting customary kai and rongoa, learning traditional crafts.	Runanga and partner organisations
Build the confidence of post-school rangatahi to transition into environmental management. Look for opportunities for internships or working alongside experts.	Runanga and organisations with relevant expertise
Succession planning within iwi management bodies.	Runanga, land Trusts

The picture shows how these approaches, along with the principles and actions outlined in Part II and III of this plan, will uphold the values and help achieve the desired aspirations, and ultimately, realise the vision.



Kia mau ki te whenua
Whakamahia te whenua
Hei painga mo nga uri whakatipuranga

Hold fast to your land
Make use of the land
For the future generations.

TATARITANGA ME TE ATA MATAKI - REVIEW AND MONITORING FOR THIS PLAN

This section outlines how progress will be monitored, and how this plan will be reviewed

Monitoring

Part I of this plan can be monitored by recording successful instances of actions occurring under the three approaches laid out in Part I of this plan:

1. **Recognition and representation**
2. **Positive relationships**
3. **Engaging rangatahi**

This information, when combined with monitoring of actions relevant to Part II and III, should provide evidence as to whether the aspirations are being advanced and the values of this plan upheld.

State of the environment indicators are monitored and reported by Regional Councils WRC and BOPRC, and can be used to track resource condition in terms of ecological and human health. The current state of freshwater bodies can also be related back to the National Objectives Framework prepared by the Ministry for the Environment. Ngati Tahu-Ngati Whaoa have been involved in developing cultural indicator for freshwater management as part of the project Nga Tohu o te Taiao, which is applicable to parts of this plan.

Together, this information will enable an assessment of progress towards the vision.

This plan now has a separate Part III *Hei Mahi – Implementation and Actions*. This identifies progress since the last update of the plan and identifies opportunities, current actions, and ideas for future actions. Steps taken under each of these actions can be recorded as part of monitoring of the plan, and progress reported on the website of Ngati Tahu-Ngati Whaoa Runanga Trust. Snapshots featuring current initiatives will provide further evidence of achievements, and reports on the status of projects will be maintained on the website:

www.tahu-whaoa.iwi.nz

Review

Some of the information in this plan will have enduring relevance over time, and other parts may change. There is an opportunity for Part III *Hei Mahi – Implementation and Actions* to be reviewed and reported on through the website, while it is expected that Parts I and II will be more enduring..

Review can include:

1. **What has been achieved and current activity**
2. **Gaps in the plan (to establish a continuous improvement process)**
3. **Where to from here**

The context may change, for example due to legislative and planning, progress with the Vision and Strategy for the Waikato River and planning for the Rangitaiki River, Central North Island forest processes and future negotiations and settlements.

At the same time, the development, implementation and review of other related documents will continue

1. **Wahi tapu register**
2. **MOUs, protocols and procedures e.g. with DOC and forestry companies**
3. **Fisheries Plan for the Upper Waikato River, TARIT Iwi Environmental Management Plan and Joint Management Agreements.**

Cross-referencing can be included, and this plan can be updated to reflect these documents as needed.

WAIATA: NO RUNGA MATOU

No runga matou te tihi ki Paeroa	**We are from the heights of the summit of Paeroa**
Ko Ngati Tahu e, ko Ngati Whaoa	**The tribes of Ngati Tahu and Ngati Whaoa**
Kaua e te iwi e pa pouri	**We are not a people predisposed to melancholy**
He iti noa nei, te iti taku iti	**Though seemingly insignificant and inconsequetial**
Kei wareware kau ki oku nei take	**We may fail to remember our essence**
I takea mai rā e te iwi, i te ngaro o te ao kohatu	**Originating from a people, lost in the obscurity of the ages**
Hei! Ha! Hei!	**Tis so! Absolutely! Tis so!**
E kui e koro koutou	**Aged women and men**
I te mate mārangaranga mai, hei kai tautoko	**From frailty please arise as supporters**
Ka tahuri ki te Raki ko Te Arawa	**Turning Northward tis the tribe of Te Arawa**
Ka tahuri ki te Uru ko Ngati Raukawa	**To the West there is Ngati Raukawa**
Kei te Rawhiti ra ko Mataatua	**Thence in an Easterly direction, at hand is Mataatua**
Ko Tūwharetoa kei te Hau Runga e	**Whilst Tuwharetoa adjoin us to the South**
Ko te Awa Waikato e pokare nei	**The Waikato River ever ripples**
Koia aku rohe!	**These are my borders!**
Hei! Ha! Hei!	**Tis so! Absolutely! Tis so!**

Orakei Korako [Geyserland]. Whites Aviation Ltd: Photographs. Ref: WA-62646-G. Alexander Turnbull Library, Wellington, New Zealand

PART II: NGA TAONGA O TAIAO -

TREASURED RESOURCES

Contents

WHAKATAKINGA - INTRODUCTION TO PART II

This is Part II of the Iwi Environmental Management Plan for Ngati Tahu-Ngati Whaoa: *Rising above the mist - Te aranga ake i te taimahatanga*. Part I gave an overview of the rohe and local environment, outlined the history and issues affecting the resources of the area, and set out values, principles and approaches that apply to the management of all natural taonga. In Part II, particular natural resources are examined in more detail, and the following information is provided:

- Historical context: What we used to have
- Existing state: What we have now
- Pressures: What impacts on this resource.

In light of this information, tables then set out, for each resource:

- Principles for managing this resource
- Short-term goals
- Long-term goals

The next Part III *Hei mahi - Implementation and actions* also looks at each resource in turn, focusing on:

- Opportunities: How to preserve and restore the resource
- Progress since the last review
- Current actions
- Ideas for future actions
- Snapshots of examples of good practice being undertaken within the rohe.

NGA MARAE ME NGA WAHI HIRANGA – MARAE, SIGNIFICANT SITES AND WAHI TAPU

Historical context: What we used to have

Marae, significant sites and wahi tapu are an intrinsic part of the history and identity of Ngati Tahu-Ngati Whaoa. In the past, many of these sites were occupied or visited regularly, and the knowledge of events and people was kept alive through oral traditions.

The river has always been a significant feature for the iwi and there were many burial areas, pa sites and cultivations alongside the river and on islands in the river. Orakei Korako was one of these settlements, recognised as the birthplace of the iwi.

Existing state: What we have now

As the land was alienated from the iwi, the close relationship with many significant sites has been weakened. In some cases the knowledge about the sites and their history is not retained, or only a few people have this knowledge. However, there are some valuable reports that have collected historical knowledge, and some areas have been thoroughly mapped, with historic sites registered. The Runanga has also created a wahi tapu register which can hold this knowledge.

There has been some damage to significant sites through earthworks. Many significant sites for the iwi have been impacted by the raising of the river level for hydro-generation; these include burial caves and island pa.

There are four remaining marae in the rohe (see Map 2 in Part I). Hui and activities are held on these marae that bring iwi members together, including tangihanga, wananga, workshops and whanau celebrations. The name Whaoa has also been given to the whare at Reporoa College.

Some significant sites have been returned to iwi ownership, including areas at Orakei Korako/ Red Hills, Waiotapu, and two peaks in the Paeroa ranges. The iwi works with DOC on management of sites within public conservation land, including important places such as Maunga Kakaramea (Rainbow Mountain) and Lake Rotokawa.

Effects on cultural values and sites are now more widely recognised through resource management processes. The hydro-dams on the Waikato River are operated by Mercury (formerly Mighty River Power), and the resource consents to undertake this activity require a peer review panel to track the impacts of its activity, including effects on customary Maori interests and cultural values. For the geothermal development at Ohaki, the annual review process for the consents requires obtaining feedback from Ngati Tahu-Ngati Whaoa on any cultural effects of the operation or of any proposed changes to the system management plan. Similarly, the consents for the Rotokawa operation require cultural indicators to be established, tracked and monitored by its peer-review panel.

Pressures: What impacts on this resource

A continuing challenge is to retain the knowledge of significant sites, and the history associated with these places, as those who currently have this knowledge pass on. Sites that are not marked and recognised may be destroyed or disturbed by land use. Loss of Te Reo Maori fluency may mean some of the cultural richness behind histories and names is not appreciated or passed on.

Original names for places may be forgotten, and their meaning lost if there is no wider recognition of the pre-European history of a site.

If access to land is not freely available to the iwi, this can impact on the ability to exercise kaitiakitanga practices and to maintain a strong inter-generational connection to the site. Similarly, access to cultural materials is important in order to retain the knowledge and experience of traditional cultural practices.

Geothermal and hydro-electricity developments have taken place in a way that has jeopardised the relationship of Ngati Tahu-Ngati Whaoa with our ancestral land and sites of significance to us. Sacred sites remain submerged under water held up by the Waikato River dams, and fluctuating river levels may threaten further sites along the current river edge with flooding or erosion. At Ohaki, ngawha and sacred sites around the marae have been destroyed by geothermal over-exploitation and the bathing pool water is now cloudy rather than its previous clear blue colour. The whare itself is also threatened by land subsidence and flooding of the river. This has created division amongst the iwi as the question of whether to relocate the wharenui Tahumatua was debated.

Marae become less sustainable if there are too few iwi members to look after them and take on roles in hosting and manaakitanga. The following excerpt comes from the book Ohaki: A Power Station on Maori Land by Evelyn Stokes:

> *"A marae is the focus of community life but it needs people to "keep warm", a Maori concept known as ahi ka. The mauri or soul of the people is placed in the meeting house and it is there that the people gather on important occasions to discuss matters of tribal importance, for tangihanga and other gatherings. The marae at Ohaki is still used but its functions are restricted by the lack of people living at the marae. This lack of residents at Ohaki should not be interpreted to mean that the marae is no longer important. It retains its status in Maori terms despite the fact that residents have had to move away in the last few decades to find jobs because local employment opportunities are very limited. A nucleus of families around the marae is desired to provide the warmth and care required to promote the fuller use of this marae for the benefit of Ngati Tahu who wish to return periodically for special occasions, or spend holiday periods with their kin away from the pressures of urban life. It would also provide a place where the young of Ngati Tahu may learn from their elders in a traditional environment."*

In addition to poor employment prospects, inappropriate planning provisions can impede iwi members moving home (for example, no allowance for papakainga development).

Turanga whakahaere - Principles for management of this resource

Wahi tapu are not appropriate sites for development or commercial use

There should be no further loss or degradation of wahi tapu, marae and significant sites through flooding, land subsidence, earthworks or development

It is not always appropriate for knowledge of wahi tapu to be publicly available, but resource users and councils need enough information so that wahi tapu are not degraded or lost

Significant sites for the iwi should be co-managed, or managed by the iwi

Knowing the significant sites, using traditional place names and reviving historical knowledge is integral to the cultural heritage and identity of the iwi, and can also bring the landscape alive for other residents and visitors

Access to significant sites is part of continuing cultural existence

Use of traditional cultural materials fosters connection to place and keeps ancestral practices alive

Orakei Korako is the birthplace of the iwi – it is imperative to preserve what remains, minimise further impact, and restore opportunities for iwi to use the site

Marae are hubs for the iwi, places of learning, and sites for the retention and transmission of tikanga, kawa and reo

Marae should be examples of environmentally friendly practice

Options for papakainga development and sustainable local employment support iwi members coming home and strengthen marae and other iwi structures

Whainga wa poto - Short-term goals	Whainga wa roa - Long-term goals
• Wahi tapu identified and historical information collected • Iwi have experience and knowledge of wahi tapu and their history • Iwi have experience and knowledge of traditional cultural materials and a cultural materials plan is developed and implemented in conjunction with DOC, covering access to cultural materials on conservation land • Place names and historical knowledge are integrated in public signage and educational/ interpretation information • No further loss or degradation of wahi tapu or significant sites occurs • Papakainga development options are included in district plans • Marae act as hubs for activity and fun for the people - facilities and activities at all marae attract whanau and iwi members, including rangatahi • Eco-friendly practices are in place at marae • Marae are used more frequently as venues by stakeholders, community hosting workshops, powhiri for inductions, hui etc	• All wahi tapu are appropriately managed • Iwi stories and historical knowledge of significant sites are retained, shared where appropriate, and appreciated • Iwi are accessing and actively using traditional materials for cultural practices, and associated knowledge and skills are being passed on • Traditional names are reinstated and in common use; signage is bilingual • Significant sites to the iwi are restored where feasible • All of the roles that underpin activity at marae are sustained in perpetuity, upholding the mana of the marae and iwi • Marae demonstrate the highest standard of eco-friendly practices, mara kai and plantings • Papakainga land developments are established and thriving • Sustainable local employment allows more iwi members to return home.

Ohaki pool Jan 1963

NGAWHA - GEOTHERMAL

Historical context: What we used to have

Geothermal resources are a special feature of this rohe and were prized by the tupuna for their many uses. The iwi built pa and papakainga near geothermal areas to cope with the notorious cold weather of this region. Different ngawha were dedicated to specific uses - cooking pools, bathing pools, healing mud for skin conditions and arthritis, and ngawha with mineral properties for dying and for preserving wood.

The geothermal site Orakei Korako is the ukaipo for Ngati Tahu-Ngati Whaoa – the first traditional settlement of Tahu Matua. Historically, this was the principal home for the tribe and from there the people dispersed across the rohe. The 'Hidden Valley' was one of the first geothermal tourist attractions of the region, with recorded visits from the mid-1800s.

Ohaki was another geothermal kainga for the iwi. The large Ohaki ngawha with its clear, pale turquoise-blue water and extensive white sinter terrace was described in 1939 by E.E. Vaile in the book *Pioneering the Pumice* as "the most handsome pool in the whole thermal area".

Iwi members have many memories of traditional uses of the geothermal resources of the rohe. Whanau members know the locations of ngawha with healing properties. Orakei Korako had a bathing area in times gone by. Ngawha near Ohaki Marae fed flowing water to a bathing pool that could be emptied and cleaned out. The ngawha were also used by the cooks at Ohaki and Te Toke Marae - hot water would be fetched in buckets, and there was a pool for scalding pigs as well as steam-holes for cooking. Tamomoe, an overnight scone cooked in the steam, was an iwi speciality. In more recent times, steam was piped into Ohaki Marae from the power station for use in the steamers over a ten-year period, but due to maintenance issues with the pipes, gas is now used instead. Geothermal heat was also used historically for local glasshouses and lucerne drying, and for mushroom growing at Te Kopia.

The iwi has had to witness the destruction and degradation of geothermal features as the government undertook large-scale electricity developments. As the Ohakuri hydro-dam caused the raising of the river at Orakei Korako, most of the geysers and geothermal features were drowned by the rising water levels, along with many significant sites. The iwi were forced to move away from the papakainga after watching their homes being burnt to the ground.

Geothermal fields themselves became a focus for electricity development. In New Zealand geothermal electricity generation began in the 1950s at Wairakei, which is still operating today. This was followed by Ohaki, which opened in 1989. The government of the time did not allow for Ngati Tahu to participate in these developments.

The geothermal stations at Wairakei and Ohaki have resulted in severe impacts on the iwi. Natural geyser activity and springs have been irreparably damaged at Wairakei. As geothermal fluid was extracted at Ohaki, the steam holes and bathing areas at Te Toke and Ohaki Marae lost water and heat, and stopped functioning. A sacred rock was flooded. Drilling rigs disturbed the ground in urupa areas and bones were exposed. Land subsidence and the rising river levels and associated bank erosion threatened the whare at Ohaki Marae. Discharges of geothermal fluid from Wairakei into the river caused elevated mercury and arsenic levels in kai species and in sediment that has settled out behind the dams (see section on Wai).

The impacts of these early developments on the prized geothermal and river features were devastating for the iwi. Iwi members had to witness the destruction of treasured resources and sites, and received no benefit from the developments while others exploited and profited from them.

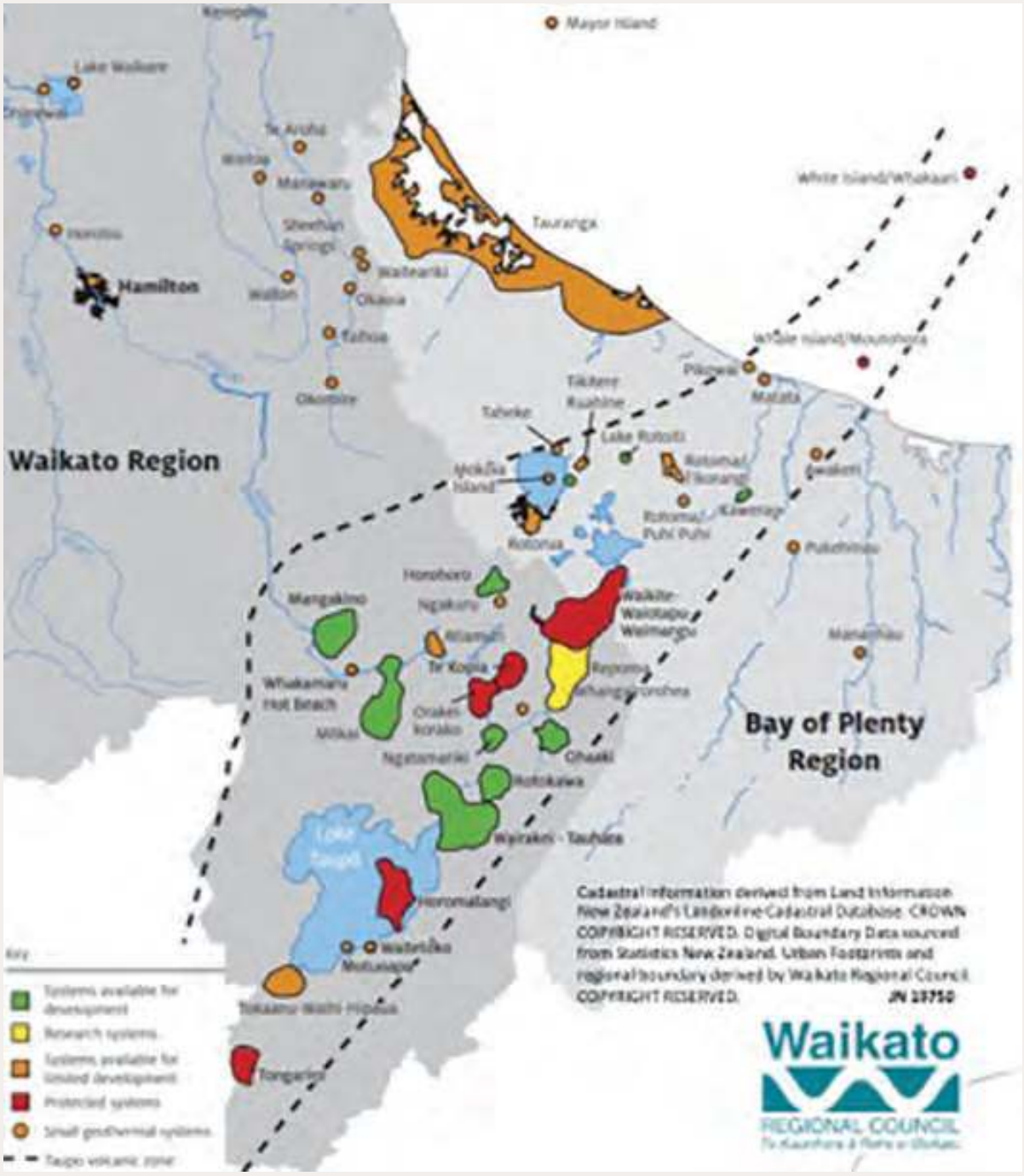
In more recent years the iwi has become a partner in developing geothermal resources, and has worked to reduce the impacts of those developments. Rotokawa Power Station was opened in 1997, now operated by Mercury in partnership with landowners Tauhara North No 2 Trust (TN2T). In 2010 Mighty River Power (now Mercury) and TN2T opened a second power station called Nga Awa Purua on the same Rotokawa field. On the Ngatamariki field Mercury and TN2T have developed yet another geothermal power station. The original wells at Ngatamariki were drilled by the Crown and returned to the iwi through Treaty settlements. Statutory acknowledgements through the Te Arawa Deed of Settlement signed in August 2006 acknowledge the historic association of the iwi with geothermal fields (termed the “Rotorua Region Geothermal System”).

Existing state: What we have now

The Ngati Tahu-Ngati Whaoa rohe is rich with geothermal reservoirs that form part of the Taupo Volcanic Zone – Rotokawa, Orakei Korako, Ohaki, Ngatamariki, Reporoa, Waiotapu, Waikite and Te Kopia. Despite so much damage and destruction, the rohe is still home to some of the most special geothermal features in the country. Many are in a natural and unspoilt state, and support rare geothermal plants and other organisms.

The Taupo Volcanic Zone (see Map 6) is considered a vast energy field, with up to 500 times the total gas potential of New Zealand. Geothermal is a constant form of electricity generation and does not involve burning fossil fuels that contributes to climate change. Some carbon dioxide is released from geothermal fluid, but the amount depends on the characteristics of the particular geothermal field, and the local fields are lower emitters of carbon dioxide. The infrastructure to generate from this resource is expensive, but ongoing costs are lower than many other forms. Care must be taken to protect surface geothermal features which can be damaged or lost through extraction of geothermal fluid and heat for electricity or other energy uses.

Map 6: Geothermal systems in the Taupo Volcanic Zone



Current geothermal uses listed by the NZ Geothermal Association in 2006 for this area *(An assessment of geothermal direct heat use in New Zealand)* include electricity generation, bathing, tourism, timber drying at Ohaki, spas and showers heated at Orakei Korako, and various uses at Arataki Honey (heating space, water and honey, rearing bees, domestic use). Nearby at Wairakei, steam from the generation process is diverted to an orchid greenhouse and a hotel. Separated water is used at a prawn farm and a tourism park (to create silica terraces and simulate a historical geothermal environment). Ngati Tahu-Ngati Whaoa are partners in geothermal tourism operations at Orakei Korako and Wai-o-Tapu.

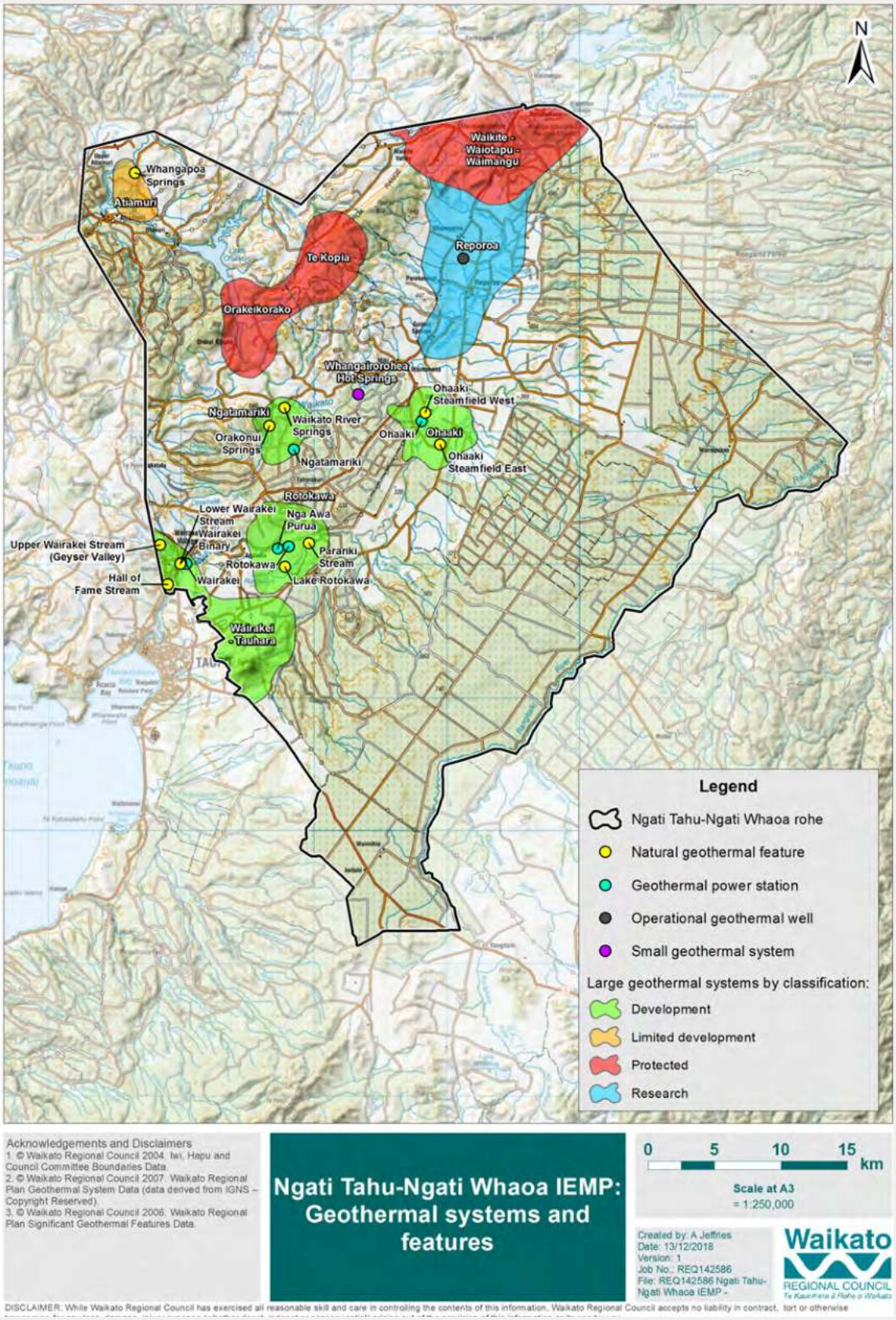
The rate of use of the resource has depleted the fields at the early electricity development sites and affected surface features. Due to the historic developments described above, the current state of geothermal features at Ohaki is not what it once was. The delicate sinter edge of the Ohaki Ngawha has partially collapsed and the white silica formations have weathered to a dull dirty grey. The sinter terrace is cracking and has plants growing through it. The bathing pool is no longer fed by natural geothermal flows. Most of the other flowing surface features at Ohaki have dried up and the mud pools have cooled. Very few of these features now remain as anything other than dry hot ground. The area of steaming ground has expanded. An urupa now has steam rising through the graves, and the ground has opened up in places. Subsidence caused by geothermal development has caused a road to become flooded by the Waikato River, and Ohaki Marae has been threatened, creating uncertainty and dissension around the relocation of the wharenui.

In addition to these impacts, iwi members have concerns about the overgrown and dirty state of some local ngawha. In some sites rare geothermal plants have been impacted by attempts of landowners to alter the natural drainage and vegetation around the ngawha. Iwi members have also identified that food takes longer to cook now in some of the local cooking holes.

Reinjection of geothermal fluid is now standard in all new developments which will help reduce subsidence and water contamination. When the station opened at Ohaki in 1988, it produced 108 megawatts of electricity. Because of cooling of the resource as a result of development, this reduced over time to 45 megawatts. The consent for Ohaki power station was renewed in 2013 and the new conditions reduced the station's allowable geothermal take by one third (to 40000 tonnes per day), and also halved the take and discharge of cooling water to the Waikato River. Wells for reinjection of geothermal fluid at Ohaki must be cased to a depth of 200m to minimise the risk of fluid entering the neighbouring groundwater or the Waikato River via groundwater. Shallow groundwater monitoring wells must be monitored to ensure there is no change in groundwater level or chemistry.

A variation to the Regional Policy Statement (RPS) and changes to the Waikato Regional Plan (WRP) have classified the geothermal systems into the categories of: development, limited development, research, and protection (see Map 7). In each of the development systems, significant geothermal features are identified in the WRP in order to avoid effects on those features. These named features in development systems are shown in Map 7.

Map 7: Geothermal field classification and significant features in systems classified for development



The aim of classifying systems as ‘protection’ is to preserve the important surface features at Orakei Korako, Te Kopia and Waiotapu–Waikite-Waimangu. The geothermal features of these areas are particularly important because the surrounding landscape is less modified than elsewhere. Te Kopia has features of international significance such as the unique and long-active mud-geyser, the only one of its type in New Zealand and possibly the world. The Te Kopia fumarole is also considered to be the most powerful geothermal fumarole currently remaining in New Zealand. Waiotapu is the most colourful thermal area in New Zealand. It has five geysers, hot springs, mud pools, fumaroles, craters, and steaming ground. Two of the springs are unique in New Zealand. The first, Champagne Pool, is large (30m wide), and is actively growing two hectares of sinter terrace. The second, Hakareteke Geyser, is the only sinter-depositing geyser with acidic waters in New Zealand. At Waikite, Manuroa spring is believed to have the largest volume of outflow of all sinter springs in New Zealand. The springs of the Waikite field are still depositing sinter, but sinter deposition has greatly reduced since the area has been developed for farming and much of the low lying ground has been drained. DOC is working to return the surrounding farmland to its natural state. Two springs are still depositing sinter, and the sinter now present around the Manuroa Spring site appears virtually identical to that shown in a photo taken in the 1890s. Land drainage for farming has also lowered the water table in the Reporoa field, affecting surface geothermal features. At Orakei Korako, 200 hot springs and 70 geysers were flooded by the Ohakuri hydro-dam. There are 35 active geysers and around 100 hot springs remaining. A concern raised by iwi members is that the ‘golden fleece’ at Orakei Korako appears to be losing its shining golden colour.

Development fields have fewer significant surface features than protection fields, or the historic features have been degraded. The Ngatamariki system is a highly dynamic area and since 1995 some springs have formed, others have dried up, and there has been a hydrothermal eruption. In late 1998, a new geyser appeared at Ngatamariki after a bank collapsed and blocked a natural upwelling of geothermal fluid. There are two large alkaline-chloride pools surrounded by bubbling acidic pools and numerous springs. One spring has dense brilliant white calcite sinter two metres wide, for five metres along its outflow.

The main development fields now all have consented activity already operational or under development. There are some indications that Ngatamariki could be connected to Orakei Korako; for this reason sentinel wells are included in the development at Ngatamariki so that any effect will be seen early on. A more robust monitoring regime at Orakei Korako could help to identify what is normal variability and when the surface features might be showing effects from nearby development. Another possibility is that Ngatamariki and Rotokawa are connected. It is unclear whether Reporoa has connectivity with the Waiotapu field, so it has been classified as a research field, meaning that large-scale use will only be consented if it can be proven there will be no effect on the protected features to the north. Even where the fields have different heat sources, they may still share the same aquifer, so fluid drawn from one field may affect another.

Independent peer review panels have been established for the generation operations at Ohaki, Rotokawa and Ngatamariki. These are scientific panels funded by the developer but reporting to the Waikato Regional Council, to assist in supervising and monitoring the exercise of the resource consents, and reviewing system management plans. Iwi can attend meetings where the peer review panels report back, and ask questions. In the case of Rotokawa, the Environment Court has called for a cultural indicator component to the monitoring regime, in addition to the physical and chemical science review.

Iwi development of any geothermal resource is dependent on gaining consent from the regional council. Depending on what use is proposed and the potential effects, gaining consent may range from a non-notified process with limited cost through to a complex process involving extensive research and legal costs. Technical investigations are needed before a proposal is lodged.

Pressures: What impacts on this resource

Tapping the geothermal resource at too great a rate causes rapid depletion of the pressure, land subsidence and loss of surface features, as described above. New developments are planned and designed to minimise these effects. However, even with current technology, large-scale development such as electricity generation will eventually mine the heat from the top layers of the system. Replenishment of this heat depends on the characteristics of the system (both heat and water elements). In some systems, water that is reinjected at depth can rise back to the surface, being reheated in the process and becoming available for use again. It is likely that heat would replenish in all systems if use ceased; however in some cases this might take several decades or centuries and not enough is known to be able to predict this accurately.

Geothermal station discharges can cause contamination. In the past, discharges to the Waikato River from Wairakei caused elevated mercury and arsenic in the river, but the geothermal fluid is now being reinjected into the ground and arsenic levels in the river are dropping (see section on Wai). Cooled steam and cooling water are still discharged into the river. Reinjection is now required at Ohaki to a greater depth than previously to avoid fluid travelling via groundwater into the river. The bathing pool at Ohaki is fed by geothermal fluid from the electricity plant, and resource consent requirements include that "antiscalants and any other contaminants added by the consent holder to the discharge and the concentrations at which they occur in the discharge shall be such that they have no adverse effect on downstream bathers". Various options are being investigated to restore the quality of the bathing pool and a new venture is now extracting silica from the geothermal fluid as a commercial product, but the bathing pool remains cloudy despite the efforts to address this problem.

The consent at Ohaki also requires monitoring of flooding effects and subsidence at Ohaki marae, with suitable remediation action to be taken if effects are found. A wetland 'offset' of at least 19.8 ha must also be created by the company to address the loss of wetlands from the development.

Land use can damage features. Land drainage can lower the water table and affect surface activity and sinter deposits. Land drainage around Reporoa is ongoing, and could further impact on geothermal springs. Sulphur mining has damaged extensive areas of altered ground on the Rotokawa geothermal system, destroying natural contours and geothermal vegetation in the vicinity, which have since been rehabilitated. Unstable banks and future pine harvesting are potential threats to springs and surface features at Ngatamariki.

Geothermal vegetation can be affected by:

- loss of steam and heat altering the geothermal habitat
- pest animal browsing or rooting
- pest plant invasion (which may be faster when ground temperature cools)
- human activity (e.g. fire, trampling, stock grazing, and vehicles).

Care is required that clearing weeds like blackberry from around geothermal features does not afford stock easier access and put the sinter at risk of crushing.

Tourist foot traffic may damage the ground and has to be managed at popular sites such as Wai-o-Tapu. The North Gully Springs at Waikite are located below the road, so the springs are vulnerable to gravel and litter from passing traffic, and damage from road works.

Turanga whakahaere - Principles for management of this resource

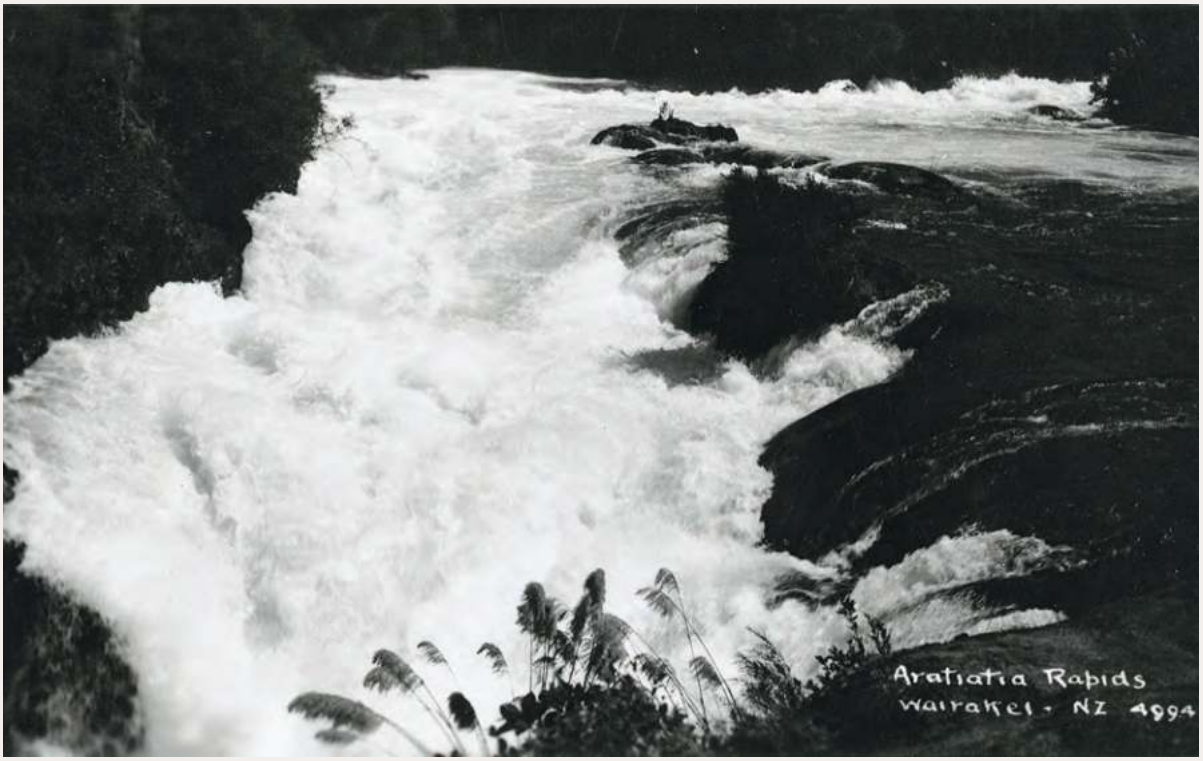
"Manage resources well, maximise opportunities, minimise risks".

- These are taonga tuku iho; Ngati Tahu-Ngati Whaoa retain and continue to assert rights and customary ownership over water, geothermal fluid and all taonga associated with these resources (e.g. bacteria and microbes found in geothermal areas)
- Iwi consent for research into what exists in geothermal areas does not in any way imply the relinquishing of intellectual property rights or customary ownership over those taonga
- Identify what is there – (geothermal fields, surface features and unique vegetation) - and plan for appropriate care and use
- Preserve remaining valuable surface features across all geothermal fields and avoid effects on significant sites in the traditional geothermal areas of the rohe: Orakei-Korako, Ohaki, Ngatamariki, Rotokawa, Reporoa, Te Kopia, Waiotapu-Waikite-Waimangu, Waimahana and Atiamuri
- Manage geothermal development carefully
    - Manage in an integrated way e.g. system management plan, consistency across regional council boundaries
    - Deep reinjection of fluid to avoid waterway contamination, subsidence and fluid depletion in the geothermal system
    - Monitor the effects of extraction – adopt a staged approach
- Restore cultural uses of geothermal resources (suitable to today's context)
- Development should be as sustainable as possible; with the iwi participating in, and benefiting from, considered development of the resource using the best technology and practices available
- Development should ideally include multiple uses, efficient uses and uses that can be sustained over a long time period to bring maximum benefits to the iwi and future generations
- Landowner Trusts have autonomy in developing the resource below their lands; the Runanga has a role providing a philosophical/ protective overview
- The role of the Runanga and landowner Trusts in kaitiakitanga of the geothermal resource should be acknowledged by developers and councils – through proactive approaches, open dialogue, listening to views, informing and involving
- Information should be shared openly (landowner Trusts, Runanga, developers, councils, Crown) – so iwi can be informed and involved at all levels

Whainga wa poto - Short-term goals	Whainga wa roa - Long-term goals
• Unique geothermal surface features and plants known by the iwi - mapped and prioritised for use, protection or restoration • Best practice in geothermal developments • Full compliance with statutory requirements for involving iwi and landowner Trusts in consenting and re-consenting, with best practice followed (early engagement etc.) • Open information sharing, iwi informed and involved – the extent, use and limitations on use of geothermal fields is understood by all • The iwi knowledge base of geothermal taonga is retained and traditional uses are practised (cooking, bathing, healing, dying etc) • Some cooking areas, bathing areas restored (including at Ohaki), and suitable facilities are in place • History/ impacts of development are documented and acknowledged • Operators work in good faith – best practice, monitoring of effects, sharing information, benefits for iwi members	• More local use is made by iwi of geothermal resources – cultural/ traditional, domestic and economic • The iwi knowledge base of geothermal taonga is increased and passed on to future generations, who in turn practise and pass on traditional uses (cooking, bathing, healing, dying etc) • All unique geothermal features and vegetation are protected and restored where possible • Arsenic and mercury in Waikato river return to natural levels • Geothermal development is as sustainable as possible • Subsidence is minimised (minor and localised only) • Minimal effects occur on surface features, no effects on significant features, mitigation on other features as an option when appropriate – contribution by all Joint Venture partners • Valuable minerals and steam/ heat are utilised prior to reinjection

Toitu he kainga, whatungarongaro he tangata

The land remands when the people have disapeared.



WAI – LAKES, RIVERS, STREAMS, WETLANDS AND AQUATIC LIFE

Historical context: What we used to have

The Waikato River has always been a taonga to the iwi, its pristine water a source of physical and spiritual well-being. The river and its tributaries traditionally provided kai resources such as tuna and kokopu (known elsewhere as koaro). A landlocked population of kokopu existed in historical times in Lake Taupo, thought to be introduced there deliberately by Maori. There are historical accounts of temporary kainga established by Ngati Tahu-Ngati Whaoa around kokopu harvesting areas at the mouths of tributaries in the rohe, and plentiful catches of this kai species providing sustenance for the iwi. But from 1874 numbers of kokopu declined. At the time this was attributed to a 'blight', and the introduction of trout from the late 1870s would have had a further ongoing impact, until few fish remained by the 1950s.

Historically, the Maungatautari Falls (now submerged under the Atiamuri hydro-lake) created a major natural barrier to fish movement up the Waikato River. However, there are accounts of fish species such as piharau (lamprey), kokopu (koaro) and inanga making their way to the upper river before the hydro-dams were built, and some tuna were found up as far as Huka Falls. By 1939, when E.E. Vaile wrote Pioneering the Pumice, the native fish were already scarce: "It is said that the native kokopu and inanga used to abound, but they have disappeared. Doubtless they have been reincarnated as trout."

Once the kokopu declined, koura and tuna became more important kai species for the iwi. In the 1930s, tuna was the main kai taken from the river by iwi members. In the wider Rangitaiki catchment, tuna are prized and regarded as a taonga, providing sustenance for the people of the river. Tuna in the Upper Waikato were limited in numbers by natural barriers to access and then by the hydro-dams, but have become more abundant due to trap-and-transfer projects begun in the 1990s. Koura were widespread in the rohe until relatively recent times (the 1980s and 1990s), but have since declined, for unknown reasons. Kakahi (freshwater mussels) have become more abundant in the rohe since the construction of the hydrodams created more slow-flowing habitat and allowed sediment to settle creating suitable habitat. Iwi members recall times when tuna and koura were more abundant in the waterways of the rohe. In recent memory, introduced kai such as trout and watercress were also easier to find in local streams like the Mangahoanga, but are not so common now.

The construction of the hydro-dams caused massive changes to the Waikato River (see Part I of this plan, Modifications to the Waikato River, and *Mahinga Kai: Ngati Tahu-Ngati Whaoa Story)*. In addition to the hydro-dams, other infrastructural developments have impacted upon the majestic nature and essence of the Waikato River, including utility and transport infrastructure and tourism developments. The Rangitaiki River also has three dams that were constructed during the 1960s and 1970s (Matahina, Aniwhenua and Wheao) which have affected fish passage between upstream waters and the sea. The lower Rangitaiki was substantially altered in the early 1900s, with intensive wetland drainage and the lower river being diverted from its original channels to a more direct outlet at Thornton, in efforts to advance agricultural development.

Over time, exotic species of fish and water plants have also altered natural aquatic ecosystems significantly. As noted above, the ongoing decline of the kokopu (koaro) in the Upper Waikato occurred with the introduction of trout. Surveys in the Rangitaiki catchment of sites where dwarf galaxias were previously recorded show that this species is absent once rainbow trout come to occupy the stream.

In the past, repo (wetlands) were found all along the Waikato River from Reporoa to Te Toke. The name ‘Reporoa’ (long wetlands) gives an indication of the prominence of wetlands in the landscape. There was a flax mill in Reporoa in former days, producing rope. The rich wetland habitats supported ducks and other waterbirds, and native fish like kokopu and tuna, all of which were important food sources for the iwi. Other cultural resources were also obtained from local wetlands including harakeke (flax), raupo and a black paru (mud) used for dying. Wetlands in an undisturbed state played a key role in the landscape as filters and purifiers – the ‘kidneys’ of Papatuanuku. Wetlands also regulated flood peaks and summer dry flows.

Existing state: What we have now

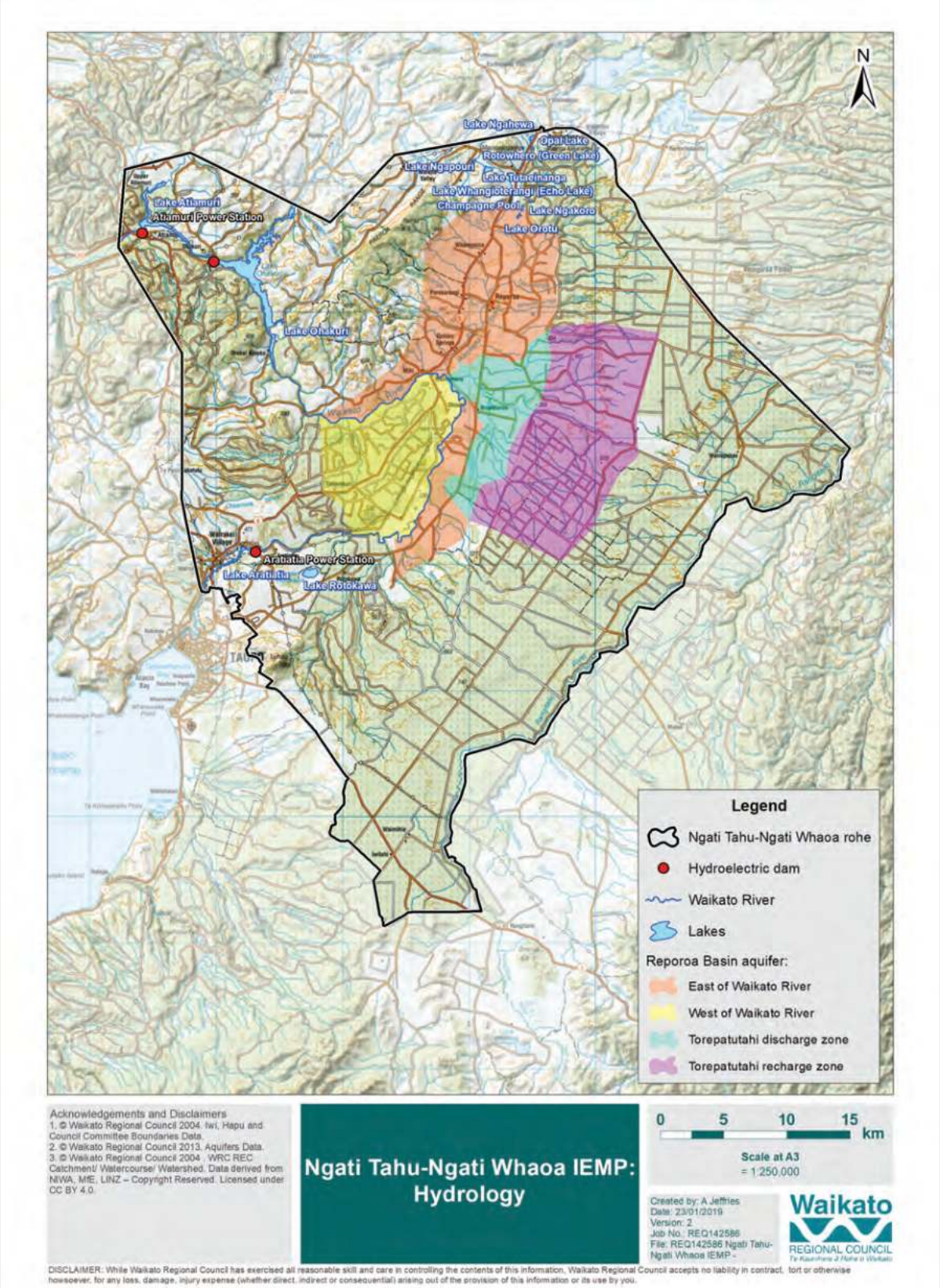
The following information covers the existing condition of different water resources: rivers and streams, wetlands and lakes, and groundwater. Map 8 shows some of the significant water resources of the rohe.

The rohe of Ngati Tahu-Ngati Whaoa includes the pristine upper reaches of both the Waikato River (longest river in the Waikato Region and in New Zealand) and the Rangitaiki River (longest river in the Bay of Plenty).

In the Waikato catchment, the land area which falls within the rohe is 1485 km^2, with 81 km of the main river stem and around 2100 km of streams and tributaries. Principal tributaries to the Waikato River within the rohe are the Awapiripiri, Kahuki, Kiriohineki, Kopaki, Makawe, Mangahoanga, Mangatoetoe, Orakonui, Paetarataramoa, Parikawau, Parariki, Patiki, Peikikaikoura, Pouaru, Taratahi, Te Kokowai, Te Wai o Kereua, Waiehu, Waiotapu, Wairakei, Waitakahi, Whakapanake, Whangairorohea, and Wharekahakaha.

The area of the Rangitaiki catchment which falls within the rohe is 462 km^2 which covers 265 km of stream length. Principal tributaries to the Rangitaiki River within the rohe are the Mangatiti, Ngatamawahine, Otamatea, Otangimoana, Pekepeke, Waikaukau, Waitaruna, and Wheao as well as Flaxy Creek.

Map 8: Water resources within the Ngati Tahu-Ngati Whaoa rohe



Rivers and Streams

Native and exotic aquatic life

The iwi has published an informative booklet focused on kai species - Mahinga kai: Ngati Tahu-Ngati Whaoa Story (see box). Further information on fish and traditional fishing methods is also available in the Fisheries Plan: Whakamarohitia nga Wai o Waikato published in 2015 by Te Arawa River Iwi Trust.

Mahinga kai – summary of the Ngati Tahu-Ngati Whaoa Story about freshwater kai species

The term mahinga kai includes the kai source itself, along with methods of harvest and processing. Key mahinga kai that were historically important to iwi or are currently gathered from the waterways of the rohe include the once-plentiful kokopu (known elsewhere as koaro), the current-day tuna (eel) fishery, koura (freshwater crayfish), kakahi (freshwater mussel) and watercress. Research and historical knowledge suggest that kokopu was the key species harvested in the past but populations collapsed, while kakahi were not an important kai species in the past, but have become more abundant in the rohe once the hydro-dams changed bed and flow conditions. With the loss of the kokopu fishery, tuna and koura are now the main types of kai that iwi members gather. Watercress is also an important wild food. There are many concerns from iwi members regarding the current state of all of these kai sources.

Natural processes and features have a strong influence on mahinga kai and which species can survive and thrive in the rohe today. These features include the climate, inland location, and volcanic and geothermal activity of the rohe. These, in turn, gave rise to soil type and landform, original vegetation, the shape of the land and the catchment, and the form of Te Awa o Waikato (the Waikato River) and its tributaries, lakes and wetlands.

Distance inland and natural barriers to fish migration formed by major rapids and falls along the river meant that relatively few native fish species would ever have inhabited the rohe. Limited by these barriers, tuna (eels) would have been present only in small numbers. Of the native whitebait species, only the kokopu (known elsewhere as koaro) would have colonised this part of the catchment. Kokopu could have been washed down from the upstream population in Taupo, and survived in a 'land-locked' state, because unlike other whitebait they can complete their life cycle without travelling to the ocean.

Ngati Tahu-Ngati Whaoa arrived in the rohe in around 1250AD and we became a river iwi, living sustainably off mahinga kai and other resources that the rohe provided. At this time the iwi was able to provide kai to our people and our visitors, and for cultural events, tangi and other important occasions. This was how we lived for many centuries. Living this way formed our identity and heritage, the pride of the Ngati Tahu-Ngati Whaoa iwi. The ability of Te Awa o Waikato to sustain and provide for the people became (and still is) integral to iwi well-being.

Accounts prior to 1860 show the kokopu fishery was the staple mahinga kai harvest in the rohe from the river for the iwi. Given the size, depth and flow of the main Waikato River, much of the traditional capture of mahinga kai would have occurred in the lower reaches of the tributary streams flowing into the main awa, or in slower sections of the main river.

Europeans arrived in the central North Island around 1850. This was the beginning of many sweeping social, economic and legislative shifts for the iwi. With the limits on access to traditional living and harvest sites and the river, changes in land use (clearing of native bush for farming, with associated sediment run-off) and introduced fish species, the rohe began to feel the effects on its kai species. The way of life for iwi (including mahinga kai harvest) was highly disrupted within a short time period. Within one or two generations, iwi members went from living off their mahinga kai to being denied access to their land and home, their food and their river. From around 1880 onwards iwi began to move away from the river.

Goldfish (morihana) were the first of many species introduced to Lake Taupo and the Waikato River, arriving in around 1872. The decline of the staple traditional kokopu fishery began in around 1874. Brown trout were introduced to Lake Taupo and the Waikato River in 1877 and Rainbow trout followed around 1903. Historical records at the time state that the decline of the kokopu fishery was due to a 'blight' or disease, although the impact of predation on kokopu by introduced species would also have begun from around this time onwards.

Once the traditional food source of kokopu was no longer available, the iwi had a modified diet, introducing new kai species (morihana/ goldfish and trout) and farming European animals such as pigs. Diet at this time likely also included tuna, koura, kakahi and watercress. Alongside this there would have been cultivation of gardens and continued collection of wild foods such as puha, pikopiko and various birds.

After the initial changes in the late 1800s and early 1900s came another era of large environmental disruption within the river and catchment. Massive physical changes to the Waikato River commenced with the building of hydro-electric power dams in 1929. These dams had a major effect on the natural character of the Waikato River including changes to water levels, rate of flow, and water quality. In turn, this affected kai species, including posing new artificial barriers to fish migration. Changes in land use in the rohe continued during this time, with felling of native bush for sheep and beef farming, draining of wetlands and addition of fertilisers to the soil. These changes would have increased sediment and nutrient run-off and decreased water quality in the main stem of the river – as well as affecting other habitat of mahinga kai in the tributaries, lakes and wetlands of the rohe.

Moving into the 1960s, social and cultural factors continued to impinge on the harvest of mahinga kai. The ability for the Waikato River to sustain and provide for the iwi had been affected for some time and this was having a large impact on iwi. We were losing our ability to provide mahinga kai for ourselves, visitors and for cultural events, tangi and other important occasions. A large exodus of Ngati Tahu-Ngati Whaoa iwi began as our people moved away from the rohe. This had an effect on matauranga, heritage and connection to the river. The iwi was suffering from cultural erosion.

While commercial tuna fishing began in the 1960s, tuna were not found in high densities in the rohe until the elver (young eel) trap-and-transfer programme began in the late 1990s. Millions of elvers have been relocated through this programme, moving them past the dams so they can live in the upper Waikato River and its tributaries. With the addition of tuna and catfish (introduced around 1985) the rohe ecosystem (and its mahinga kai) had many more large predators than before. While tuna are now a valuable mahinga kai species to the iwi, there remain some unanswered questions regarding the potential impact of the trap-and-transfer programme on other valued kai species and on the health of the tuna in the river.

Geothermal fluid naturally includes heavy metals that can accumulate in mahinga kai. While geothermal inputs into the rohe have occurred from underlying volcanic activity for many years at moderate rates, the Ohaki and Wairakei geothermal stations added to this by extracting geothermal fluid from the ground and discharging it, along with its contaminants, into the river. This practice is being phased out over time, and geothermal contaminants are now re-injected back into the ground at all new geothermal electricity developments. However, there has been an accumulation of heavy metals in the river sediment that settled out behind the hydro-dams, and Ohakuri is particularly affected. For iwi, knowing where mahinga kai can be safely gathered is an important influence on kai collection practices.

Matauranga gathered by the iwi suggests that today, iwi members strongly value the tuna and watercress resources of the rohe, and collect some koura, but do not have a strong connection with kakahi. Kokopu was a very important historic mahinga kai species, but there is little association for iwi with this species at this time due to its decline in the rohe.

For some time Ngati Tahu-Ngati Whaoa had limited influence over decisions about Te Awa o Waikato and its catchment. This constrained our ability to protect our values, manage our mahinga kai and maintain our connection with these taonga. Early policy and legislation were factors reducing iwi access to land, the river and mahinga kai, and negatively impacting on environmental conditions around the health of the rohe and mahinga kai. More recent policy and legislation has seen some reversal of this. Examples include the Resource Management Act (RMA), Treaty settlements, statutory acknowledgements of interest in Crown lands, and regional and local council policies. These developments have seen some return of involvement in management of the Waikato River and lands in its catchment, enabling iwi to take a stronger role in kaitiakitanga within our rohe. Iwi have the ability to influence policy and legislation through Treaty of Waitangi settlements, co-management legislation and initiatives (including the Vision and Strategy for the Waikato River and similar planning for the Rangitaiki), and catchment and fisheries plans. The iwi has the ability to influence by participating, giving input, stating our values around mahinga kai and working with other organisations to advance the iwi vision. Ngati Tahu-Ngati Whaoa also has a strong track record in directly undertaking research and restoration projects to benefit the environment and reconnect iwi members and rangatahi with the mahinga kai of our rohe.

Iwi members report a decline over time in kai availability from local waterways. Tuna are now more difficult to find in the river, and trout are less common in the tributaries. Koura are less widespread now than they were as recently as the 1990s. Watercress is still present in patches, but people are concerned over how safe it is to eat. A study carried out by the iwi and partners found that all of the watercress sampled from local sites was safe for human consumption, but recommended more frequent monitoring.

Due to the inland location of the rohe, fish species diversity would have been naturally low. Native fish species historically found in the rohe include kokopu (koaro), porohe (smelt), bullies, and tuna (although tuna are now dependent on catch-and-release programmes to move past the Karapiro dam). Fish surveys of tributaries in the rohe carried out by the iwi in 2017-18 found only two native species: longfin tuna and common bully (see box). Kokopu (koaro) began to decline after 1874 and there are few memories of kokopu from recent history or the present day. Lamprey (piharau) are no longer found in the main Waikato River, but still exist in the Waipa. In recent years throughout New Zealand there has been a reduction in the size and abundance of both longfin and shortfin tuna, with longfin now listed as a threatened species. The abundance of commercial-sized eels has generally declined in the past two decades, along with the proportion of longfin eels. Across New Zealand, the runs of young glass eels are estimated to be less than 25% of those recorded in the 1970s. About 25 million elvers (juvenile tuna) have been caught at Karapiro dam and transferred upstream since 1994-95.

After young elvers migrating upstream are transferred over the dam at Karapiro, they can grow very fast in the hydro-lakes (e.g. some eels reach legal size of 0.22–4 kg in 2–3 years compared with 20–25 years in the South Island). In the Rangitaiki, a trap-and-transfer programme has been operating at Matahina since 1983, facilitating elver and other native fish species to migrate upstream of the dam. The system is operated by the Kokopu Trust on behalf of Trustpower. The majority of fish caught are transferred upstream of both dams to Lake Aniwhenua and the upper Rangitaiki River, with the remainder transferred to Lake Matahina. On average, over 2 million elvers are transferred upstream each year. Both shortfin and longfin are captured with shortfin eels the more abundant species. There is evidence that the trap-and-transfer programme at Matahina Dam is having some success in relocating eels into upstream sites where they were once uncommon or absent, but further work is needed to confirm this.

Nine fish species have been recorded in the Rangitaiki River above Matahina Dam. Fish distribution was analysed for the Rangitaiki River above Lake Aniwhenua in 2009 (Boubee et al.; *Assessment of the state of the Rangitaiki River within the Ngati Manawa rohe; NIWA)*. This report found that the distribution and quality of native fish such as eels and kokopu have declined in the upper Rangitaiki, reflecting fish passage issues, over-exploitation, loss of habitat and competition from trout. The researchers did not know if isolated populations of native kokopu still remained, and if so, how to protect them and their habitat. A survey by BOPRC in 2014 to fill gaps in fish survey information found that within the part of the Rangitaiki that is in the iwi rohe, the species recorded are limited to rainbow and brown trout. Outside the iwi rohe in other parts of the upper Rangitaiki, longfin and shortfin eels occur, and koaro and dwarf glaxias were recorded from a limited number of native forest sites draining the Ikawhenua Range in the Whirinaki, the eastern headwaters of the catchment *(Fisheries assessment of waterways through the Rangitaiki WMA;* BOPRC Environmental Publication 2016/12).

Of the exotic fish present in the upper Waikato, goldfish, catfish and trout were introduced in the 1800s, gambusia (mosquito fish) were probably brought in the 1930s, while rudd and guppies arrived in the 1970s. Trout, catfish and goldfish are introduced species in the Aratiatia, Ohakuri and Atiamuri hydrolakes, coming down-river from Lake Taupo. Rudd is known in Atiamuri, but not the two upper hydrolakes. Guppies released from fish tanks have been found in the geothermally-heated Waiotapu and Waihunuhunu Streams, which flow into Lake Ohakuri. Gambusia extend up the river. So far there are no koi carp in the upper river. This bottom-feeding species has invaded the lower Waikato, reaching large sizes and degrading water quality by disturbing bed sediments. Fish surveys conducted in tributary streams in the rohe found three exotic species present: gambusia, brown trout and rainbow trout (see box).

There are also introduced water weeds in the hydro-lakes such as hornwort and the oxygen weeds – lagrosiphon and egeria. Invasive aquatic plants can out-compete native plants and may block pumps and water intakes.

Surveying mahinga kai in the rohe

Surveys were undertaken at 18 sites during 2017 and early 2018, to gain further knowledge of mahinga kai distribution and condition in the Ngati Tahu-Ngati Whaoa rohe within the Waikato River catchment. The surveys will inform decision making, and guide future stream restoration and rehabilitation options, to help us continue our mahinga kai journey. The project was undertaken by Runanga staff and iwi members assisted by NIWA, providing the additional benefits of building iwi knowledge and capacity, and strengthening the connection with streams and sites in different parts of the rohe. Thirteen of the eighteen sites were surveyed using fyke nets (similar to hinake) and gee minnow traps, while five sites were surveyed using electric fishing.

What we found

Across the 18 survey sites, only a limited number of different species was caught. Three introduced fish species (gambusia, rainbow trout, brown trout) and two native fish species (longfin eel, common bully) were captured. Koura were also found at several sites. The mahinga kai species of main interest were tuna, koura and watercress.

- A total of 124 longfin eels were captured across all the sites. The majority were between 400 and 800mm long; six were longer than one metre and only four were less than 200mm long. With the exception of one site, all tuna were considered to be in good condition.
- Koura were captured at five of the eighteen sites but were only abundant at one site. A total of 24 were captured at the five sites. The average length was about 7 cm from eye to end of tail; two were larger than 9 cm.
- Watercress was found at 14 of the 18 sites surveyed and was extensive at several sites.

What was missing

No kokopu (known elsewhere as koaro) or shortfin eels were captured or seen at any of the sites surveyed. Kokopu were historically an abundant source of kai for the iwi, but have drastically declined since the 1870s. The absence of shortfin eels at the survey sites was surprising, as there was suitable habitat present. It may be that shortfin eels can be found in the main river and the lower reaches of some of the tributaries rather than at the sites we chose for surveys, which were mainly higher up in the tributaries. Longfin eels are known to penetrate further inland than shortfin eels.

Condition of the mahinga kai sites

We assessed the habitat availability and quality of the sites we surveyed. Most of the sites ranked as excellent or good for mahinga kai and many had potential for future restoration. When assessed from a matauranga perspective using the Wai Ora Wai Maori assessment tool, most sites also ranked as either excellent or good. These matauranga-based assessment tools can be used in future to continue to build this knowledge and track changes over time.

River level fluctuations

Riverside areas are still affected by flooding and stagnant ponding as the river level is raised and lowered for hydro-generation purposes. There are ongoing concerns about flooding of urupa along the river and erosion of the banks, and the threat to Ohaki marae. The current consent for the hydro-dams was issued in 2006 for a period of 35 years. It specifies minimum and maximum levels and normal operating ranges, and also requires that the Aratiatia spillway gates be opened several times a day to replenish the Aratiatia Rapids for tourist viewing purposes. A peer review panel must report to the Waikato Regional Council annually as part of the consent. Its scope includes ecological effects and the effects that operation of the Waikato hydro-system is having on customary Maori interests, both ecological and cultural, in the Waikato catchment.

Water monitoring

Map 9 shows the sites where WRC monitors regularly for groundwater quality, surface water quality and ecological stream life (invertebrates).

(see following page)

Water quality

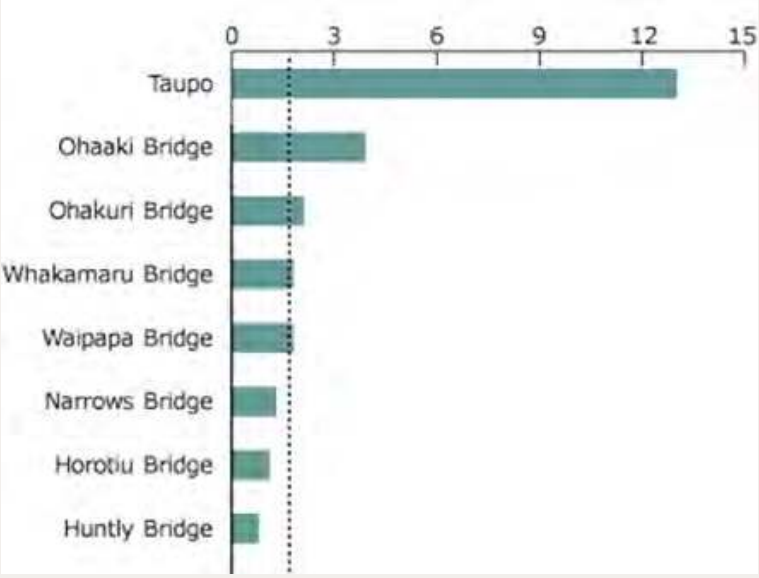
Current water clarity throughout the upper Waikato River is considered high by regional environmental standards, as the water leaves Lake Taupo in very good condition (see Figure 1). The graph shows, however, that water clarity declines as it travels down through the series of hydro-dams.

On average, free-floating algal cells (phytoplankton) are responsible for about half of the drop in clarity in the Waikato River between Taupo Gates and Ngaruawahia. The other half is due to sediment (silt and clay) in the water.

Before the dams were built, it took six days for a drop of water from Lake Taupo to reach the sea. Now it can take up to a month. The increased time that water is held back by the dams allows the growth of phytoplankton, making the water greener and murkier. There are low algal cell counts in the water leaving Lake Taupo, and the short residence time of water behind the Aratiatia dam does not promote algal growth. However in Ohakuri, the largest hydro-lake, water has a residence time of 9 days, creating the opportunity for algae to grow. Here water clarity shows a decline, and clarity continues to get progressively worse as the water flows downstream.

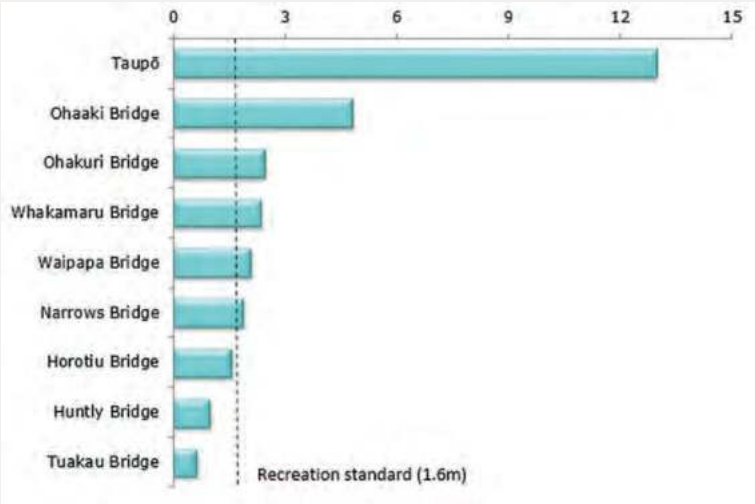
The 25-year trend in clarity shows some deterioration at Upper Waikato sites (see Figure 2). However, over the shorter timeframe of the last ten years, all eight sites on the Waikato River have shown an improvement in clarity, and clarity is now suitable for swimming (1.6 m) all the way to the Narrows. This is apparent when comparing the clarity graph from the 2013 version of this plan with the most current 5-year data results (Figures 1a and 1b). In the last ten years, chlorophyll in the upper river sites has remained unchanged, while turbidity has been improving at Whakamaru and Waipapa. This suggests that it is a reduction in turbidity, rather than a change in phytoplankton that is responsible for recent improvements in clarity.

Figure 1a: Median water clarity (m) in the Waikato River - 2007-2011 data



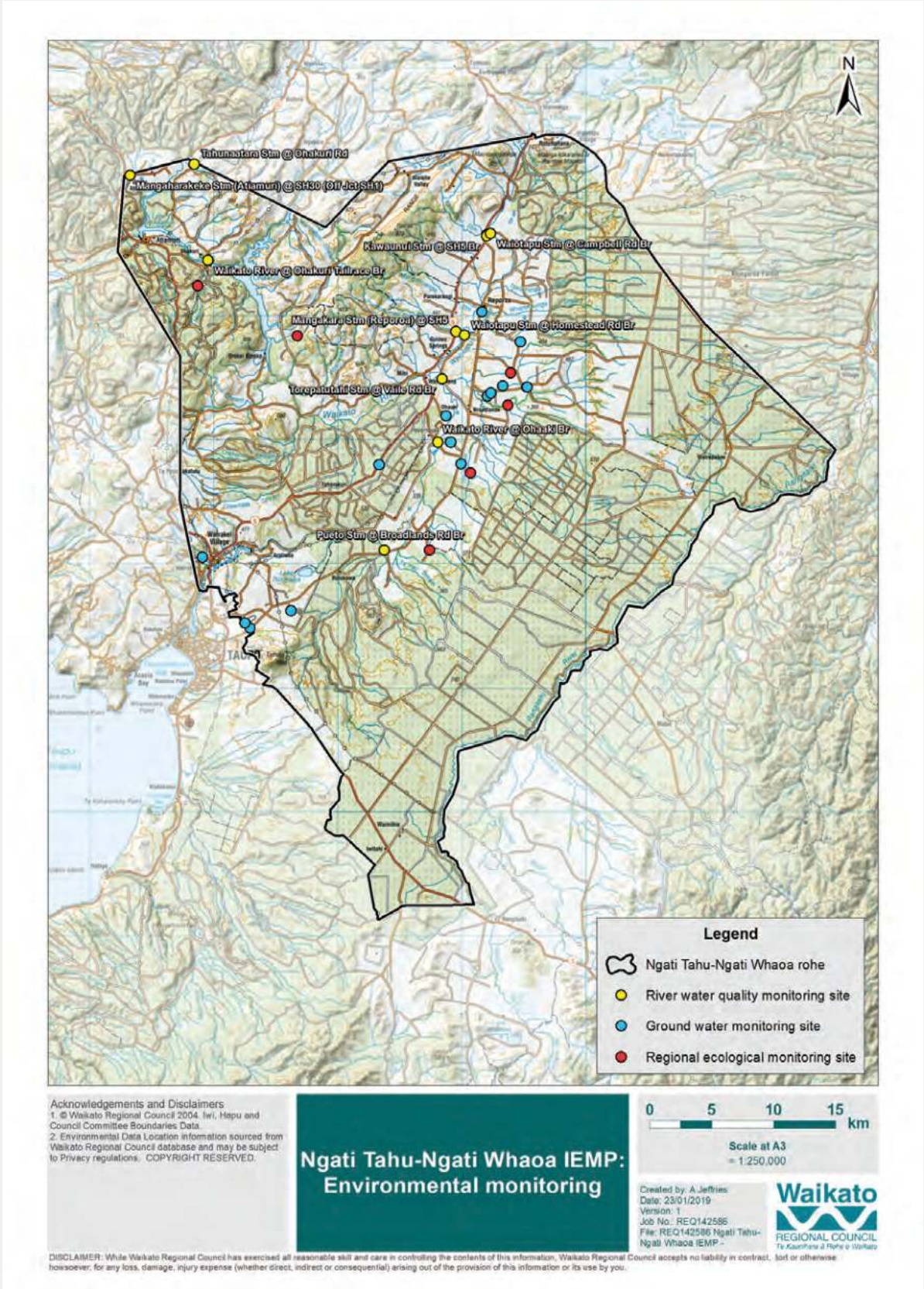
Source: Waikato Regional Council website: environmental indicators.

Figure 1b Median water clarity (m) in the Waikato River - 2013-2017 data



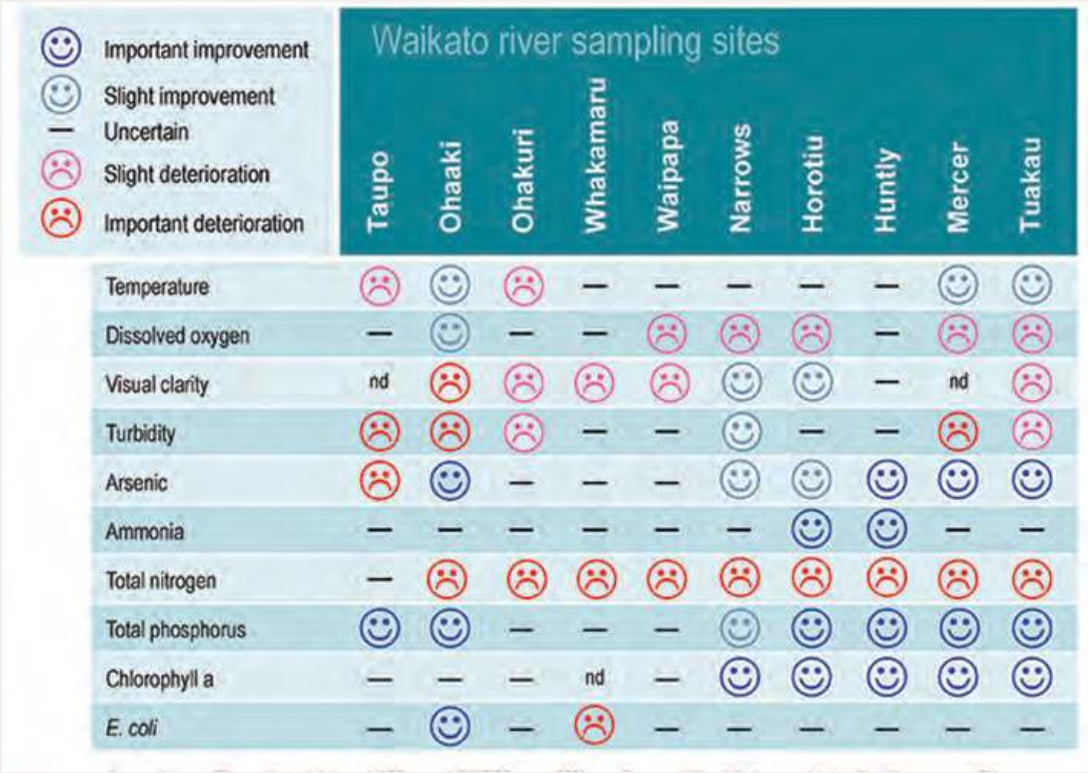
Most algae present in waterways are harmless, but blue-green algae in large numbers ('blooms') may produce toxins. There are occasional toxic blooms in the Whirinaki Arm of Lake Ohakuri. This arm has low flow and limited exchange with the main lake, meaning water stays in the Whirinaki Arm for several weeks. Warm temperatures and elevated nutrient levels in the still water support algal growth. In most years, algal blooms are confined to these still backwaters, but in 2003 during dry, hot conditions there was a bloom across the upper hydro-lakes of a new invasive species called Anabaena planktonica. Subsequent years with similar weather conditions did not result in blooms. Possible reasons for this were the reduced dominance of this species, the arrival of a new zooplankton that grazed the bloom-forming species, and reduced nutrient levels in the river water because of a lack of rainfall throughout the catchment (meaning a higher proportion of the river was clean water coming from Lake Taupo).

Map 9. Waikato Regional Council water quality monitoring sites



There is a consistent trend of increasing nitrogen at all sites on the Waikato River (Figure 2). Because there is a lag of 10-150 years as groundwater moves through the ground to reach the river, the effects on the river from recent intensification and land conversion remain to be seen. The increasing nitrogen has not seen a corresponding increase in phytoplankton (measured as Chlorophyll). Phosphorus is considered to be the more important nutrient limiting algal growth in the hydro-lakes, although nitrogen is thought to have more influence in certain conditions. Phosphorus shows an improving trend over the 25-year data period from 1993-2017.

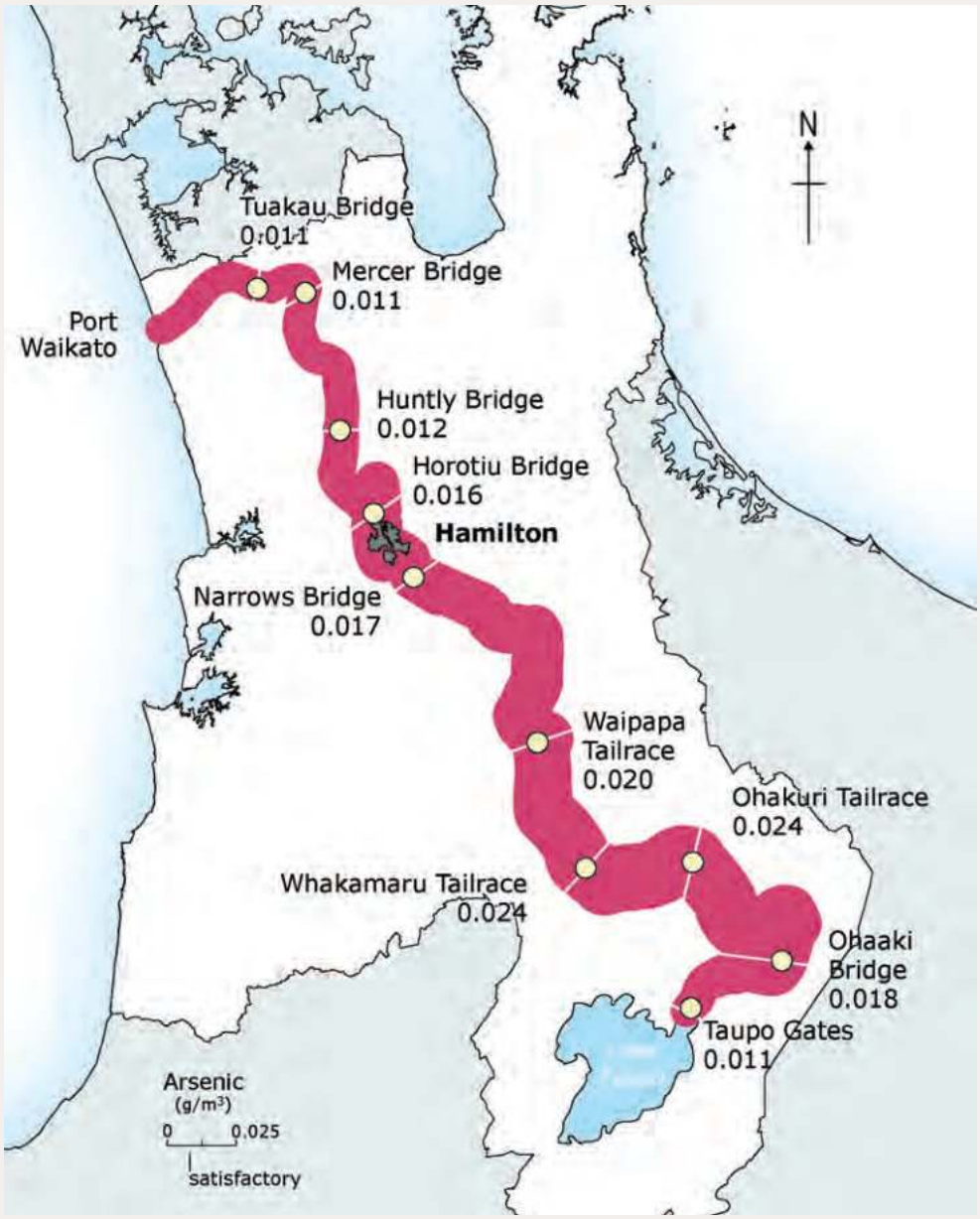
Figure 2: Water quality trends in the Waikato River for the 25 years between 1993 and 2017



Source: Waikato Regional Council website: environmental indicators.

One of the indicators currently exceeding health standards is the level of arsenic in the river (see Figure 3). The width of the worm-like band in the picture represents the arsenic level. Arsenic is a heavy metal that is toxic to humans. For water to be safe to drink, it should contain less than 0.01 grams of arsenic per cubic metre. With the building of the Wairakei geothermal station in the late 1950s, the amount of arsenic in the Waikato River more than doubled. With changes to consent requirements, arsenic levels are now improving (see Figure 2), although they still exceed drinking water standards throughout the river. The sediment of Lake Ohakuri has the highest concentration of arsenic of all the hydro-lakes, exceeding guidelines to protect ecological health by eight times. Further research would be beneficial on bioaccumulation of arsenic in eels, which are susceptible due to their long lifespan. Watercress also accumulates arsenic and it is not recommended to harvest watercress from the main river alongside Lake Ohakuri. Another substance associated with geothermal activity is mercury. Fish in the hydro-lakes, including trout and tuna, show elevated mercury levels. and only occasional harvest would be recommended.

Figure 3: Arsenic concentrations in the Waikato River (g/m3)

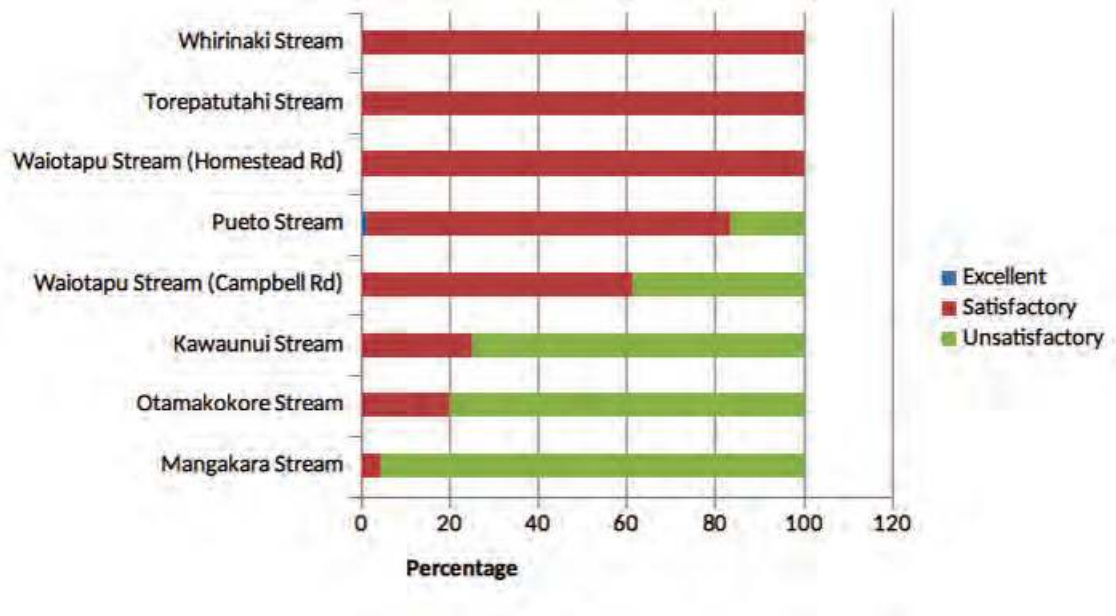


Source: Waikato Regional Council website: environmental indicators.

Water quality in tributary streams

The tributaries to the Waikato River are monitored at 12 sites in the Upper Waikato, including 8 sites within the Ngati Tahu-Ngati Whaoa rohe (see Map 9). Water quality is assessed for its suitability for ecological health, and for contact recreation. The graphs in Figure 4 summarise the results for the Upper Waikato sites.

Figure 4: Water quality results relating to ecological suitability (first graph) and contact recreation (second graph) for Upper Waikato monitoring sites



Source: Waikato Regional Council website: environmental indicators.

In general, the monitored streams are satisfactory for ecological health half to three-quarters of the time, but less satisfactory in the Waiotapu stream. The reasons for unsatisfactory results across the tributaries are mostly excessive nutrients, and less often turbidity (murkiness) and high temperature, which may be due to geothermal activity in some cases (e.g. Waiotapu). Geothermal sites may also have unsuitable pH and ammonia levels.

Clarity and faecal microbe indicators are the two measures used to assess suitability for contact recreation. Apart from the Kawaunui, Otamakokore and Mangakara, the monitored streams are generally satisfactory for contact recreation. These three sites are unsatisfactory for both clarity and E. coli measures. Clarity is also often unsatisfactory in water samples from Waiotapu at Campbell Rd, but this site has satisfactory E. coli levels. Streams at Torepatutahi, Whirinaki and Waiotapu at Homestead Rd are not tested for clarity, and their E. coli records did not begin until 2013, but all three sites have tested satisfactory for E. coli since then. (Previous reporting in the 2013 version of this plan recording Waiotapu at Homestead Rd as unsatisfactory, based on information on the Waikato Regional Council website, was incorrect).

Regional ecological monitoring of streams (sampling the stream life) shows that 70% of sites sampled in the Upper Waikato are 'excellent' or 'good' (up from 50% in 2013) and another 20% rate as 'fair' habitats.

Water quality in the Rangitaiki catchment

In the Rangitaiki, monitored rivers and streams are classified as satisfactory for both ecological and swimming measures, and algal biomass is generally low. The catchment has a large proportion of exotic forestry (55%) and native forest (25%), and a smaller proportion of developed pastoral land (15%). Downstream of the forested headwaters, there are deteriorating trends for nitrogen and clarity. Throughout the catchment, average invertebrate scores show that 102 out of 117 sites monitored are in either excellent or good condition, with stream health highest in areas draining native bush or exotic forest, such as the headwater areas in the iwi rohe.

Wetlands

Wetlands have been drained for farming throughout the rohe, and this has greatly reduced the extent of remaining repo. The fog around Reporoa is indicative of the basin landscape that would naturally support wetlands, but extensive drainage for farming has caused a dramatic decline in their extent. Around 92% of the pre-European wetland area in the Waikato River catchment has been lost, and 77% of the former wetland areas in the Rangitaiki River catchment no longer exist. As wetlands are lost, the cultural use of wetland resources also diminishes. Iwi members noted that the knowledge of where to find natural dyes from wetland paru, and how to use them, is no longer widely held.

Wetland areas remain around lakes Ngahewa, Ngapouri and Ohakuri, on Waikato River bends near Ohaki (Hardcastle lagoon and Rawhiti wetlands), and within some forestry areas (e.g. at Te Toke and within the Kaingaroa forest). Important wetlands associated with geothermal areas are at Waiotapu, Maungakakaramea, Orakei Korako, Te Kopia and Waikite. There are riparian wetlands along the Rangitaiki River in the south of the rohe, and at Reporoa the Torepatutahi stream has riparian wetlands that are rated by the Rotorua Lakes Council as locally significant. There is a constructed wetland at Ohaki to allow manipulation of the water management regime, including full drainage when required. This wetland is now owned by the iwi and co-managed with Fish and Game under conservation covenant.

Lakes

Natural lakes in the rohe include:

- Ngahewa
- Ngapouri/ Opouri
- Whangioterangi/ Echo Lake
- Orotu
- Tutaeinanga
- Rotowhero
- Ngakoro
- Rotokawa.

Hydro-lakes in the rohe are formed by the dams on the Waikato River at Aratiatia, Ohakuri and Atiamuri.

Te Arawa Lakes Trust owns the beds of Ngahewa, Tutaeinanga, and Ngapouri, under the Te Arawa Lakes Settlement Act 2006. Fisheries regulations developed by Te Arawa Lakes Trust apply to these lakes.

The lakes listed above fall within the region of Waikato Regional Council. Table 1 shows information from the ranking of lakes in the Waikato Region rated in 2011 as part of the regional assessment of Significant Natural Areas. This ranking should be treated with a degree of caution, as there is incomplete information on all of the lakes.

Table 1. Regional ranking of lakes in the Ngati Tahu-Ngati Whaoa rohe as Significant Natural Areas

Lake	**Ranking amongst all lakes in Waikato Region**
Ngakoro	6th equal
Whangioterangi	13th
Orotu	14th
Ngahewa	19th equal
Rotowhero	21st
Rotokawa	24th equal
Opouri (Ngapouri)	27th
Ohakuri	31st equal
Tutaeinanga	65th

Source: Significant Natural Areas of the Waikato Region – Lake Ecosystems. Waikato Regional Council Technical Report 2011/05

The top-ranked three lakes in the rohe are part of the internationally significant geothermal wetland complex at Waiotapu. As the water is geothermal, they do not support the same freshwater life as other lakes, but they are valued as a rare ecosystem.

Ngakoro ranks highly because of this, having a rare terrestrial ecosystem type on its margins (scrub or shrubland on heated ground). Its natural connectivity is intact. It has a good proportion of native vegetation in the catchment (36%), with some pine present but a wide buffer around the wetland. It covers 12 ha and is 20 m deep.

Nearby Orotu has 30% native vegetation in its catchment and its margins are home to the largest known population in the region of the naturally rare geothermal fern Cyclosorus

interruptus. It is smaller than Ngakoro and has nutrient inputs from the farmland to the south. t is a Wildlife Management Reserve/ Scenic Reserve managed by DOC.

Whangioterangi has less indigenous vegetation in the catchment (6%) and a relatively narrow riparian buffer. It is 5 ha in size and 25 m deep.

Rotowhero is a small (2.6 ha) geothermal lake with 7% indigenous vegetation in its catchment and a small but intact riparian buffer. It supports geothermal vegetation on its margins. It is fed by acid sulphate chloride springs. Algae are the only plants recorded from this lake and the acid conditions are not conducive to fish life. It is a scenic reserve, managed by DOC.

To the south, Rotokawa is a more extensive geothermal lake. It is home to a unique leech which can survive in the very acidic water (pH 2). This is the only site in NZ where this species is recorded, but it is not known if this leech is in fact native or was introduced. The lake is large (62 ha) but has a low diversity of native vegetation around it, and only 8% native vegetation in its catchment. Most of the catchment is farmed, but there is no stock access to the lake. Rotokawa is part Maori-owned and part managed by DOC.

The geothermal lakes are naturally acidic and unlikely to have ever supported a diversity of fish life. However, they provide habitat for native waterbirds and wetland birds like matata (fernbird), pueto (spotless crake), kawau tui (little shag), kawau tuawhenua (black shag) and weweia (dabchick).

Sulphur mining from the 1960s to the 1980s damaged the natural features of Rotokawa. The mining operation stripped large areas of hot ground, destroying natural contours and geothermal vegetation. The vegetation is now regenerating on the hot ground.

Rotokawa

Outside of these geothermal areas are three freshwater lakes: Ngahewa, Ngapouri (also known as Opouri), and Tutaeinanga. All of these lakes show the effects of the surrounding agricultural land use. Exotic plants and pest animals are present around their margins.

Ngahewa

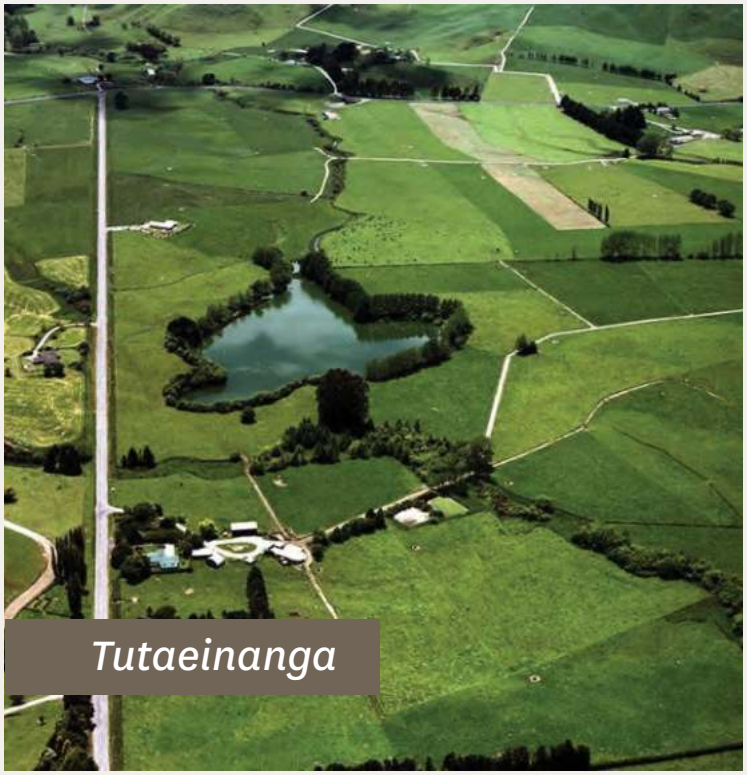
Lying to the north of the Waiotapu thermal areais Lake Ngahewa which is within the Lake Ngahewa Recreation Reserve administered by the Department of Conservation. It is shallow (7.5 m) and 8.4 ha in area, with associated wetlands 40 ha in area. It has 5% native vegetation in its 746 ha catchment, which is otherwise used for dry-stock farming and forestry. It is ranked 9th for biodiversity among the region's 71 shallow lakes. Nutrient status is considered to be very high (hypertrophic or 5.8 on the Trophic Level Index). The lake is well buffered with no stock access, water levels are maintained and there are connections to nearby lakes and wetlands. Its water quality has declined due to sediment and nutrient inputs and is now considered poor, with its condition unstable. In 1973 it was free of exotic plants, but by 1989 exotic plants dominated. Aquatic vegetation collapsed in 2000, leaving it essentially devegetated. Resurveyed in 2008, it showed some improvement and some native plants existed, but exotic plant species still dominated.

The 2016 survey found further decline, and it is now classified as non-vegetated. One living freshwater mussel was found in that survey. Native fish populations are naturally low due to downstream dams and geothermal activity, but common bullies are present. Rainbow trout are released into the lake annually. Birds present include matata (fernbird), weweia (dabchick) and pueto (spotless crake). The lake lies within a recreational reserve. Mistletoe plants *(Ileostylus micranthus)* occur in the reserve, and protective bands have been placed on host trees to prevent possum browsing. The upstream wetland has had extensive restoration undertaken by DOC including willow control, fencing and planting. Signage and iPou (posts with information accessed via a phone app) have also been installed at Lake Ngahewa to provide information on Ngati Tahu-Ngati Whaoa values as well as biodiversity and recreational opportunities.

Ngapouri formed inside a volcanic crater. It is 25 m deep and 26 ha in area. There is in-flow to the lake from Tutaeinanga, while out-flow is to the Ngapouri stream which feeds into the Waiotapu. It has less than 2% of its catchment in native cover, with no stock access to the lake and a partial riparian buffer. It has poor water quality and high sediment inputs. In the past, fish kills in the lake have been attributed to deoxygenation, and plants may also be subject to root death during times of low oxygenation in the water. However, the lake scores moderately in the vegetation survey, as it still has some native aquatic vegetation as well as exotic species. There are native pondweeds and for the first time in 2016, charophyte meadows were recorded. Freshwater mussels were also found at two of the five survey sites. The lake is in a Crown land reserve administered by Fish and Game. It has boat access, and rainbow trout are released into the lake annually. An extensive fencing and planting project has been undertaken at the lake. Fences have been realigned to the reserve boundaries, establishing an increased buffer of approximately 3 hectares of restoration riparian plantings around the lake. This work was assisted by funds from the Waikato River Authority, Waikato Regional Council and Department of Conservation. The project has been led by Ngati Tahu-Ngati Whaoa Runanga Trust and implemented by Fish and Game Eastern Region. Signage and iPou have also been installed at Lake Ngapouri to provide information on Ngati Tahu-Ngati Whaoa values as well as biodiversity and recreational opportunities.

Ngapouri/ Opouri

Tutaeinanga is smaller (3 ha) and shallower (11 m) than Ngapouri. The lake margin is a Wildlife Management Reserve administered by Fish and Game. Virtually the entire 500 ha catchment has been cleared of native vegetation, and dairying is the main land use. Water leaves via a drain to Ngapouri. It is ranked 44th for biodiversity among the region's 71 shallow lakes. Nutrient status is considered high (hypertrophic or 5.8 on the Trophic Level Index). The submerged vegetation in Tutaeinanga improved in the latest survey (2016), but still rated 'poor', with some native pondweed but a dominance of exotic vegetation.


Tutaeinanga

This followed the 2008 survey which showed little submerged vegetation. Prior to that, native aquatic plants had been present in 2004, when the lake scored well on the lake vegetation index. Freshwater mussels were observed at two of five survey sites in 2016. The lake is a moulting site for putangitangi (paradise ducks). The 2018 Rotorua Lakes Waterbird Survey found that dabchick populations had greatly increased and the lake now supports a large number of dabchicks relative to its size. An extensive fencing and planting project has been undertaken at the lake. Fences have been realigned to the reserve boundaries, resulting in an increased buffer of approximately 1.5 ha of restoration riparian plantings around the lake.

This work has been done in conjunction with the restoration project around Ngapouri.

In 2016 the 3 Lakes Action Plan was written on behalf of Ngati Tahu-Ngati Whaoa, the Department of Conservation, Eastern Region Fish and Game, Te Arawa Lakes Trust and Waikato Regional Council. The purpose of this plan is to re-establish working relationships and for agencies to align activities while working at these sites, not only with each other but also when working with communities, adjacent landowners and other interested parties. The plan describes ecological and cultural information about each lake and identifies what needs to be done to achieve the plan's objectives though integrated action tables. The group continues to work together to achieve positive outcomes and improvement at these three lakes.

Although the hydro-lakes on the Rangitaiki River are downstream of the rohe of Ngati Tahu-Ngati Whaoa, they are influenced by upstream activities. The lakes are affected by nutrient enrichment from surrounding land and algal growth. Lake Aniwaniwa (at the Anawhenua dam) is classed as eutrophic (poor water quality) and Lake Matahina as supertrophic (very poor water quality), with very few native aquatic plants left in either lake (SPI scores of 12% and 10% respectively). The headwater areas within the rohe are in exotic pine plantation, but any change to a more intensive land use would have an impact on downstream waters.

Groundwater

The groundwater systems of the Upper Rangitaiki and the Upper Waikato are predominantly unconfined aquifers, overlain by free-draining volcanic deposits. Rainfall soaks into the porous soils, and river flows are groundwater-dominated.

Groundwater quality of the Reporoa basin was investigated by the Waikato Regional Council in 2005 at 32 sites to assess the impacts of land use, particularly nitrogen inputs. Some evidence of elevated nitrogen concentration was detected in several bores. There was also elevated arsenic in 20% of the wells. More information and modelling studies were progressed for the Healthy Rivers Wai Ora process *(Summary of ground water studies conducted for the Waikato/ Waipa Healthy Rivers Wai Ora Project*, prepared by T. Petch, 2015). Groundwater sampling in the Reporoa area showed the nitrate-nitrogen concentration was highly variable, ranging from non-detectable to above Maximum Allowable Values (MAV). For the whole of the Upper Waikato area, 30% of sub-catchments had groundwater nitrate concentrations above MAV and another 32% of sub-catchments had concentrations between half of MAV and MAV.

A key question is regarding the 'load to come' (nitrate lost from more intensive land use that has moved below the root zone of plants, and is sitting in groundwater that will eventually make its way to streams). The load to come depends on:

- the history of land use
- the flow paths and travel times of groundwater moving to surface water, and
- the transformations that occur along the way.

In terms of history, the Upper Waikato is the part of the Waipa and Waikato catchments that has seen the greatest rate of intensification and increase in nitrogen loss since the 1970s.

The flow paths of the Upper Waikato reflect the light, free-draining soils. Very little runoff occurs during and after storms, and stream beds in the headwater areas are often dry except during storms. Most (94%) of the rainfall enters groundwater and reappears later as flow in rivers and streams, generated from springs located downstream where groundwater intersects the surface. The underlying basement rock is virtually impermeable and the rainfall in the upper Waikato ultimately appears as flow in the Waikato River, but this can take some time. Mean groundwater residence time in the aquifer below Reporoa has been found to be between 11 and 73 years, with one spring of the Torepatutahi Stream having a mean residence time of 150 years. Investigations for the Healthy Rivers Wai Ora process established that the mean age of surface water in the Upper Waikato was about 52 years, reflecting the residence time of groundwater.

Regarding transformation of that nitrate, research by Lincoln Agritech and collaborators is showing that nitrate removal is high where poorly drained soils occur in the Reporoa basin (impeded pumice, waterlogged, and peaty soils found near streams and in low-lying areas). In these wet soils the

absence of oxygen means nitrate in water can be transformed into nitrogen gases and released back to the air. This can result in removal of most of the nitrate load leached from the root zone. Buried carbon in older soils covered by younger volcanic deposits can also assist in removing nitrate from the shallow groundwater. In the free-draining pumice areas (such as slopes), oxygen is present and nitrate removal does not occur in this way, meaning more nitrate can reach streams via the groundwater. It is difficult to predict how much nitrate removal will occur across a whole catchment because there is a mosaic of different soils and groundwater pathways. There can also be seasonal and annual variation in nitrate transport, depending on rainfall and the depth of the water table below the ground. This affects the proportion of water in streams that is younger groundwater containing more nitrate from farming activity, versus older groundwater with lower nitrate concentration.

Water quality management

Both the Bay of Plenty and the Waikato Regional Councils are developing policy and plan changes to improve water quality, involving co-governance and co-management models.

The Rangitaiki River Forum (established through the Ngati Whare Claims Settlement Act 2012 and the Ngati Manawa Claims Settlement Act 2012) has produced a document to set direction for the Rangitaiki catchment called *Te Ara Whanui o Rangitaiki – Pathways of the Rangitaiki*. Ngati Tahu-Ngati Whaoa have not been part of the Rangitaiki River Forum to date, but provision is made for other iwi with recognised interests in the Rangitaiki catchment to join the forum at a future point. Liaison is occurring with BOPRC staff to ensure the iwi is involved in future planning for the Rangitaiki River.

The iwi has taken an active role in the Healthy Rivers Wai Ora process that has produced the Waikato Regional Plan Change 1, which seeks to improve water quality as part of achieving Te Ture Whaimana o te Awa o Waikato/ The Vision and Strategy for the Waikato River. The Proposed Plan Change will see new requirements on landholders to reduce the loss of sediment, nutrients and faecal material to waterways within the Waikato catchment. Key changes proposed include stock exclusion, no increase in contaminants lost from land (constraining land use change), and farm environment plans showing how reductions will be made. The relationship of tangata whenua with their lands has been recognised in a policy under the proposed Plan Change.

Water allocation management

A Region-wide Water Quantity Plan Change (Plan Change 9) has been developed by Bay of Plenty Regional Council/ Toi Moana, as the first step in a two-stage approach to improving the rules for water quality and quantity management in the Bay of Plenty. The plan change was undertaken to strengthen water allocation limits and management of water quantity in the region. The new provisions that have been notified include confirmation of interim allocation limits, a policy to decline new applications for water takes in areas that are already fully allocated, registration of all permitted activity water takes, increased metering and reporting requirements, and a decrease in the amount of groundwater allowed to be taken as a permitted activity on small properties. The total volume of water allocated to water users through consents has reached or exceeded the regional default thresholds for most of the Rangitaiki catchment. Limited water is available above the Matahina Dam in order to maintain the flow for generating electricity.

Variation 6 to the Waikato Regional Plan deals with water allocation, and creates processes to determine when a water resource is reaching its maximum allocation. Water takes of more than 15 m^3/day require resource consent. Under Variation 6, the Upper Waikato River is fully allocated and the Reporoa basin groundwater reserves are also approaching full allocation. Iwi members are concerned that the current water allocation system makes no allowance for iwi, and that over-irrigation may be wasting water resources. Under the Resource Management Act, there is legally no provision for prioritising water allocation among users, and water is allocated on a 'first in, first served' basis. When the water allocation for the then Mighty River Power operation was reduced by 2% under the Variation, this water was quickly reallocated under consent applications for water takes to support a large-scale conversion of pine to pasture. Now that full allocation has been reached again, new consent applications in the Upper Waikato are on hold.

Iwi representatives are involved in discussions over iwi rights and interests in water. Various pieces of legislation have ruled on ownership of river and lake beds, but debate continues about rights to the water itself. Iwi members have said they would also like to play a more active role in monitoring water pollution and being involved in reporting or enforcement.

Pressures: What impacts on this resource

The iwi is involved in researching what is currently affecting kai species such as tuna, koura and kakahi. Koura and kakahi are likely to be affected by the quality of the stream bed as well as the water column. Kakahi are filter feeders and as such they purify the water. Little is known about why they may decline in numbers. Koura have a range of habitats and can be found in streams, lakes, ponds and swamps. Koura are sensitive to pollutants such as heavy metals or toxic blooms and may be impacted by geothermal inputs or ramping (rapidly rising and falling river levels). Koura in lakes can be affected by periods with no oxygen in the bottom waters. Koura densities are lower in pasture streams than in native forest streams, and while they may grow faster in pasture streams, they live longer in the cooler water of native forest streams. Koura have an animal-based diet including snails and mayflies/mayfly larvae, and they prefer the still water of pools. Koura are predated by native and introduced species (tuna, trout and catfish). Habitat refuges such as logs, tree roots and undercut banks provide important cover, critical for hiding from predators. Natural barriers like waterfalls or drop-offs can also prevent predator access to upstream koura habitat, allowing koura to grow in safety.

Tuna are more able to withstand conditions in pastoral streams, and can even grow faster and larger there due to warmer temperatures, greater in-stream production and access to pasture invertebrates as food sources. The types of habitat loss likely to affect tuna are wetland drainage, channel straightening, loss of riparian cover, and stop-banking of floodplains in the lower river. In addition to habitat effects, tuna are impacted by disruptions to their life cycle, reducing recruitment of juvenile tuna (elvers). Likely causes for decline in tuna populations generally are:

- over-fishing of adults
- mortality and delays in migration due to obstructions in the waterway (e.g. dams, flood gates, pumps and turbines)
- changes in ocean currents as part of global climate disruption.

In both the Upper Rangitaiki and the Upper Waikato, tuna are clearly impacted by barriers to migration created by dams. Longfin tuna are more detrimentally affected by hydro-schemes than shortfin, because they penetrate furthest inland. Only those elvers that are assisted can get over the hydro-dams to populate the upper catchment. Once in the upper catchment, any tuna that are not harvested are blocked from travelling to sea to breed and complete their life cycle, as hydro-turbines kill virtually all eels attempting to pass. An active trap-and-transfer project exists in both the Rangitaiki and the Waikato catchments to assist migrating eels to move upstream past the dams, and in the Rangitaiki there has been some voluntary effort to assist mature tuna with downstream migration. Trap-and-transfer systems for eels migrating downstream have not been established in the Waikato River because commercial fishing has reduced the number of tuna reaching maturity and needing to migrate downstream from the upper catchment. This level of commercial harvest may also reduce the availability of tuna locally for the iwi.

Tuna are subject to commercial fishing pressure. Nationally, regulations have been put in place to control commercial fishing and significant reductions have been achieved. Eels entered the quota management system for the North Island in 2004, but the initial total allowable catch was not reached, and following concerns that it was set too high, the quota for North Island longfin was reduced by an average of 58% in 2007/08. Iwi have customary harvest rights over tuna fisheries in their rohe and 20% of the commercial fishery is allocated to iwi, although numerous iwi around the country have chosen not to fish their allocated commercial quota in order to protect and revitalise customary harvest. The Ministry for Primary Industries collects data on commercial fishing, but data is not collected on recreational and customary fishing. The total commercial catch above Karapiro dam fluctuates between 10 and 28 tonnes per year. Around 10 tonnes are taken annually from the three hydro-lakes in the rohe, where 3-4 commercial eel fishers operate. Throughout New Zealand, the average size of tuna being taken by commercial fishers has decreased over time, indicating over-fishing that could further affect recruitment of juvenile tuna in the future. There have been calls to suspend commercial fishing of longfin tuna as it is now classed as a threatened species.

Other native fish are also affected by barriers to migration, although the distance inland of the iwi rohe would naturally have limited the diversity of fish.

There is little specific information on the ecosystem effects of introduced fish, but they both eat native species and compete with native fish for food. Historically, kokopu (koaro) in Lake Taupo declined after the introduction of rainbow trout and then smelt. Koura are eaten by trout and catfish. An observed decline of koura in Lake Maraetai coincided with the introduction of catfish at around that time, although increased stocking of eels may also have contributed. Bottom-feeding fish such as goldfish and catfish disturb bed sediments and deplete food sources for native species like eels. Rudd has a clear grazing preference for native aquatic plants, and can cause aquatic vegetation in lakes to collapse.

In addition to water quality, the hydro-dams and pest fish, other habitat pressures on native aquatic species include perched/ overhanging culverts, draining of wetlands, straightening streams, and clearing riparian margins. Invasive aquatic weeds can out-compete native plants and affect oxygen levels in the water. Invasive terrestrial weeds can reduce the ecosystem health of wetlands and lake and river margins. Wetlands are also damaged by drainage and stock access, and wetland birds are threatened by predators. Water level fluctuations affect wetlands and riparian areas associated with the Waikato River. A threat to the geothermal lakes is that any development of the geothermal field that resulted in a loss of heat could also change the nature of the lakes and the surrounding habitat. This is because the lakes and wetlands are a surface expression of the field below.

Pressures may come from what is taken from the water resource as well as what is put into it. The increasing intensification of dairying has created greater demand for water, especially for irrigation. If irrigation is inefficient, this creates further pressure on the water resource. Lowering groundwater through drainage can also affect the activity of surface geothermal features.

The upper Rangitaiki is under plantation forest rather than intensive land use, but downstream there are 121 resource consents throughout the Rangitaiki catchment for the take and use of water from ground or surface water bodies. There are around 1000 live consents in Area B of the Waikato River catchment (the co-management area of Te Arawa River Iwi Trust and its affiliated iwi, including Ngati Tahu-Ngati Whaoa). Among the main consented activities are the hydro-dams, and discharges to water covering the geothermal power stations, bathing pools, Arataki honey and stormwater from landfill and quarrying operations. Mercury (formerly Mighty River Power) holds consent to return shredded aquatic weed matter from the hydro-lakes back into the river. There are also numerous consents for surface water and groundwater takes. Not all of these consents can be monitored, so monitoring is prioritised. There are also 62 Permitted Activities in the Waikato Regional Plan (which do not need consent), including irrigating dairy effluent under standard conditions. While consented activities are indicative of some pressures (particularly arsenic and mercury discharges), overall it is the diffuse effects of land use that have a greater impact on water quality and are more difficult to monitor and control.

Intensification of land use increases the loss of nutrients to water. The main nutrients of concern are nitrogen and phosphorus, because they act as fertilisers in the water and encourage aquatic plants to grow. This includes pest plants like water net, algal species that make water green, and harmful blooms that release toxins. Lakes and slow-moving water are particularly susceptible to algal growth.

Nutrients that feed the algae get to the lakes and rivers by flowing over the land (phosphorus) or seeping underground through groundwater (nitrogen and some dissolved phosphorus). Cattle urine passing through the ground is the main source of nitrogen; excluding stock from waterways does not deal with this problem. Nitrogen losses increase where there are more cows grazing, or cows are being fed more. Dairy land use leaches more nitrogen than dry stock or forestry (see Table 2). Phosphorus levels are naturally high in the rohe because phosphorus is plentiful in the parent rock material. For phosphorus, sediment and dung are the main sources of loss from land use. Phosphorus losses increase in steeper country where there is more runoff and more erosion, especially near waterways. For this reason, dry stock farming has greater phosphorus losses than dairying, unless dairy effluent is poorly managed. Stock access increases phosphorus in the water due to sediment disturbance and dung going straight into the water. Nutrient levels immediately downstream of Taupo are low, as the lake acts as a settling point, cleaning up water from the upper catchment before it enters the Waikato River. Nutrient levels in the river progressively rise as the water moves down the catchment. Variation 5 to the Waikato Regional Plan has placed controls on nitrogen emissions from land around Taupo to protect the clarity of the lake. Outside Lake Taupo catchment, changes to the rules around nutrient loss from farmland are being enacted through the Healthy Rivers Wai Ora process (Waikato Regional Plan Change 1). A limit-setting process is also currently underway for the Rangitaiki catchment.

Table 2. Comparative nutrient losses for different land uses - mean values from a range of New Zealand studies and from Upper Waikato

Land use	Mean phosphorus loss (kg/ha)		Mean nitrogen loss (kg/ha)	
	National studies	Upper Waikato	National studies	Upper Waikato
No stock (exotic or native forest)	0.2		2	3
Sheep	0.6		3	
Mixed dry stock	1.3	1-6	11	12-15
Deer	1.5		8	
Dairy	1.9	0.5-3	27	36-39 (Reporoa area)

Sources: National studies from McDowell, R.; and Wilcock, R. 2008. Water quality and the effects of different pastoral animals. NZ Veterinary Journal 56(6) 289-296. Upper Waikato data from local studies (courtesy of Waikato Regional Council)

A study in Reporoa was carried out on an irrigated dairy farm to understand the factors contributing to nitrogen in groundwater *(Reporoa nitrogen leaching trial 1998-2002, Waikato Regional Council TR2003/15)*. These results indicated that inefficient use of high rates of nitrogen fertiliser pose more risk than irrigation. In fact, irrigating water can reduce nitrogen leaching because it maintains constant pasture growth and the growing plants take up nitrogen. However, irrigating effluent is still a high-risk activity. The effluent-sprayed treatment showed the greatest nitrogen leaching losses in this trial. In the final year of the trial there was a substantial increase in nitrogen fertiliser inputs which did not result in an increase in pasture growth. This produced higher nitrogen leaching than the previous three years of the trial. This shows that excessive nitrogen application at times when pasture is not growing is costly for the farm business as well as an environmental risk.

Algal growth does not automatically rise with nutrient levels. as the ecology of algae (phytoplankton) is complex. These floating plants are affected by physical and chemical factors (e.g. flow, nutrients, and temperature), and biological factors (e.g. predation by zooplankton). Invasive fish species can further change the ecological balance e.g. by eating the zooplankton that graze on the phytoplankton. Climate change may have an increasing effect in future on the weather and flow conditions that promote algal growth.

Hydro-dams have a significant impact on aquatic ecosystems and water quality as well as the intrinsic and landscape values of the rivers. The Rangitaiki river has three dams downstream of the iwi rohe: Wheao, Aniwhenua/ Aniwaniwa and Matahina. The Waikato river in the rohe is dammed at three points: Aratiatia, Ohakuri and Atiamuri, with further dams occurring downstream of the rohe. The dams have several effects on water, aquatic ecosystems and the cultural landscape:

- Migrating river species like tuna have their natural life cycles interrupted by the dams and cannot reach the sea to breed
- Water flow is slowed down, allowing time for algae to grow in the hydro-lakes – meaning nutrient losses to the river have a higher risk of turning the river green, and causing toxic blooms
- Management of the river for hydro-generation creates fluctuations in the water levels that cause flooding, bank erosion and can further threaten significant sites along the river
- Sediment settles out as the water is slowed down by the dams. This allows arsenic and mercury from geothermal discharges to accumulate and form a contaminated lake bed. If low dissolved oxygen levels occur in the bottom of the hydro-lakes this can cause mobilisation of metals from the sediments that can then accumulate in aquatic kai species
- A positive effect of the hydro-lakes is that faecal microbe levels may be reduced because these microbes are settled out in sediment or killed by UV light in the shallow hydro-lakes.Dams and other infrastructure can impinge upon the majestic power and natural essence of the rivers. Clearance of land and harvest of forestry can also impact on these aesthetic values; our desire is that the korowai that covers Papatuanuku remains in its most natural, healthy state.

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Turanga whakahaere - Principles for management of this resource

- Iwi have rights to/ over water including groundwater, rivers, lakes, tributaries and beds of waterways – as set out in the Statement of Significance in the Deed of Settlement for the Waikato River
- The active role of Ngati Tahu-Ngati Whaoa in co-management of the Waikato River should be recognised and supported by the Crown and other agencies. Ngati Tahu-Ngati Whaoa should also be actively involved in co-managing the waters of the upper Rangitaiki catchment within the rohe
- The Vision and Strategy for the Waikato River/ Te Ture Whaimana o te Awa o Waikato provides the direction for restoring and protecting the health and wellbeing of the Waikato River; activities and actions aligned with this are supported
- The Waikato River should not be expected to absorb any further degradation
- The river should be swimmable and support healthy kai along its whole length (consistent with 'swimmable' standard in the National Policy Statement - Freshwater Management and National Objectives Framework); headwaters of streams should be safe to drink
- The majestic nature and essence of the upper Waikato River should be treasured as a significant feature of the rohe, and the pristine headwaters of the Waikato and Rangitaiki catchments should be protected
- Waterways should be protected, but the iwi should not have to bear the economic cost of returning them to health (e.g. through development restrictions on returned tribal land in forest cover)
- Iwi involvement should be maximised in monitoring, consents, plans and restoration projects, including rangatahi wherever possible
- Management should be integrated and reflect the holistic, spiritual and inter-generational Maori world view
    - o Protect headwaters (e.g. Tutukau Forest is important as a source for Mangatoetoe stream)
    - o Strengthen linkages to the Waikato river (e.g. fenced waterways to create corridors)
    - o See the whole picture – reinstate ecosystems and natural processes, protect sites of significance and traditional activity as well as enhancing water quality
    - o Waterways each have their own mauri and should not be mixed; human sewage should not enter waterways
- Vegetated riparian margins should be reinstated as they have multiple positive benefits for cooling the water, reducing sediment, returning birdlife and fish, and bringing back original plants; planting should use native species wherever possible, including those with traditional cultural uses. Riparian management is a necessary but insufficient step towards restoring
- waterways – other actions are also required to address nutrients and other contaminants
- Wetlands are precious and need to be protected and reinstated. Stock should be kept out of wetlands
- Access and harvesting rights are important to enable iwi to make use of wetland and freshwater resources
- The iwi must be involved in managing commercial fishing and customary takes, to ensure sustainable kai resources are available
- Ecological flows should be maintained in waterways; wise and efficient use should be made of available water, based on sound data to provide sufficient information for decision-making
- Water storage can make more water available for use without affecting low flows, but care is required to maintain aquatic ecological connections (e.g. migratory pathways)

Whainga wa poto - Short-term goals	Whainga wa roa - Long-term goals
• The natural values of the Waikato and Rangitaiki Rivers are recognised and protected in all development processes • Nutrients in river held at current levels (requires measures to reduce intensity on current farmland and to constrain further land clearance) • Reduction in arsenic and mercury in the Waikato River; greater knowledge of potential effects of heavy metals on food safety • Reduction in faecal contamination in tributary streams • More understanding about what impacts on kai species • Safe places known for collecting watercress and other kai; iwi have access to gather kai • Habitat in streams improved – shade, temperature, vegetation; restoration of lake margins and associated wetlands • Iwi farm blocks exclude all stock from waterways and replant with natives • No further reduction in wetland area • Traditional knowledge of wetland resources researched • Better understanding of groundwater and surface water interactions to enable water allocation and minimum flow setting • The Crown, Councils and other agencies actively seek input and guidance from Ngati Tahu-Ngati Whaoa as part of co-management of the Waikato and Rangitaiki Rivers • Iwi values and input are recognised as important, and a practicable approach to managing waterways is developed • The iwi is involved in fisheries regulations and monitoring • Joint Management Agreements and Accords entered into by TARIT with Councils or Crown are fully utilised so Ngati Tahu-Ngati Whaoa are enabled to influence policies, regulate activities and monitor water quality • TARIT supports and assists Ngati Tahu-Ngati Whaoa to achieve the highest level of water quality while enhancing and protecting the catchment of the Waikato River within our rohe • A greater understanding is gained of the pressures on the Rangitaiki, and the state of mahinga kai (past and present), to enable more effective future planning • Iwi history and stories relating to the Rangitaiki are retained and shared	• The Vision and Strategy for the Waikato River/ Te Ture Whaimana o te Awa o Waikato is achieved (see Appendix 1) • Iwi rights to water are acknowledged and enacted (Waikato and Rangitaiki catchments) • The mana and mauri of waterways is enhanced (Waikato and Rangitaiki catchments) • The natural beauty and essence of the Waikato and Rangitaiki Rivers are upheld. • Water clarity is improved – e.g. can see tuna in the water • Kai sources are restored, including opportunities for upstream and downstream migration, and kai are safe to eat • Contaminant loads to waterways are reduced, including nutrients and heavy metals - arsenic and mercury return to natural levels • Stock are excluded from all waterways in the rohe and river/ stream-bank/ lake edges are fully restored with natives • Restoration of lake water quality– reduction in nutrients and sediment entering lakes and native aquatic vegetation restored • Extensive wetland areas are reinstated • Native species associated with wetlands are abundant • Exotic plant and animal pests are controlled or eradicated in waterways, wetlands and riparian areas • Traditional practices associated with wetlands are revived • Fluctuation of river levels is reduced • Enjoyment of waterways is enhanced o Improved access for swimming, fishing and boat launching and facilities (e.g. toilets at entry points) o Well managed speed limits and allocation of activities on the upper river o Cycling and walking trails along the river from Atiamuri to Aratiatia

Titiro whakamuri
Kokiri whakamua

Look back and reflect
So you can move forward.

KOIORA – TERRESTRIAL FLORA AND FAUNA – (PLANTS AND ANIMALS)

Historical context: What we used to have

Original vegetation cover of the rohe included podocarp forests, with tussock, manuka and monoao covering large areas where forest cover had been disturbed by eruptions and fires. The Kaingaroa plateau, which experiences 230 frosts per year, was covered with native tussock and manuka prior to forestry being established there in the 1930s.

Wetland plants and animals were common along the Waikato River, and pockets of geothermal vegetation were found in geothermally active areas.

Iwi members recall that in the past there was an abundance of native plants and birds. Ti kouka, manuka, harakeke and raupo were very common plants. Native birds were all around and birds were an important food source, especially waterfowl. Native plants like ti kouka were eaten, and many native species were used as rongoa, including kawakawa, koromiko and raureka (a large-leafed *Coprosma;* the yellow part below the bark was used as an eye medicine). The strongest rongoa were collected from where the sun shone directly on the leaves. Other remedies were derived from wild herbs such as the leaf and root of dock (used as a skin poultice and a blood purifier), and dandelion (used for sores).

Ngati Tahu-Ngati Whaoa was an iwi known for weaving, with particular materials sourced from native plants for each of the woven products – for example, whariki required a long harakeke fibre.

Tupuna tracks allowed access to seasonal food sources and prized materials, and the iwi traditionally moved nomadically between food sources, providing a natural recovery period within this seasonal cycle.

Existing state: What we have now

Iwi members noted that while there is still plenty of harakeke around, these may not be the right types for different weaving purposes. Native plants and birds are generally less abundant, and drainage has reduced the extent of raupo. As farm land is developed, there are fewer opportunities to collect the wild rongoa and food species, and permission is required from DOC to collect native plants from public conservation land. Iwi members are concerned about the use of 1080 and effects it may have on birds and game species.

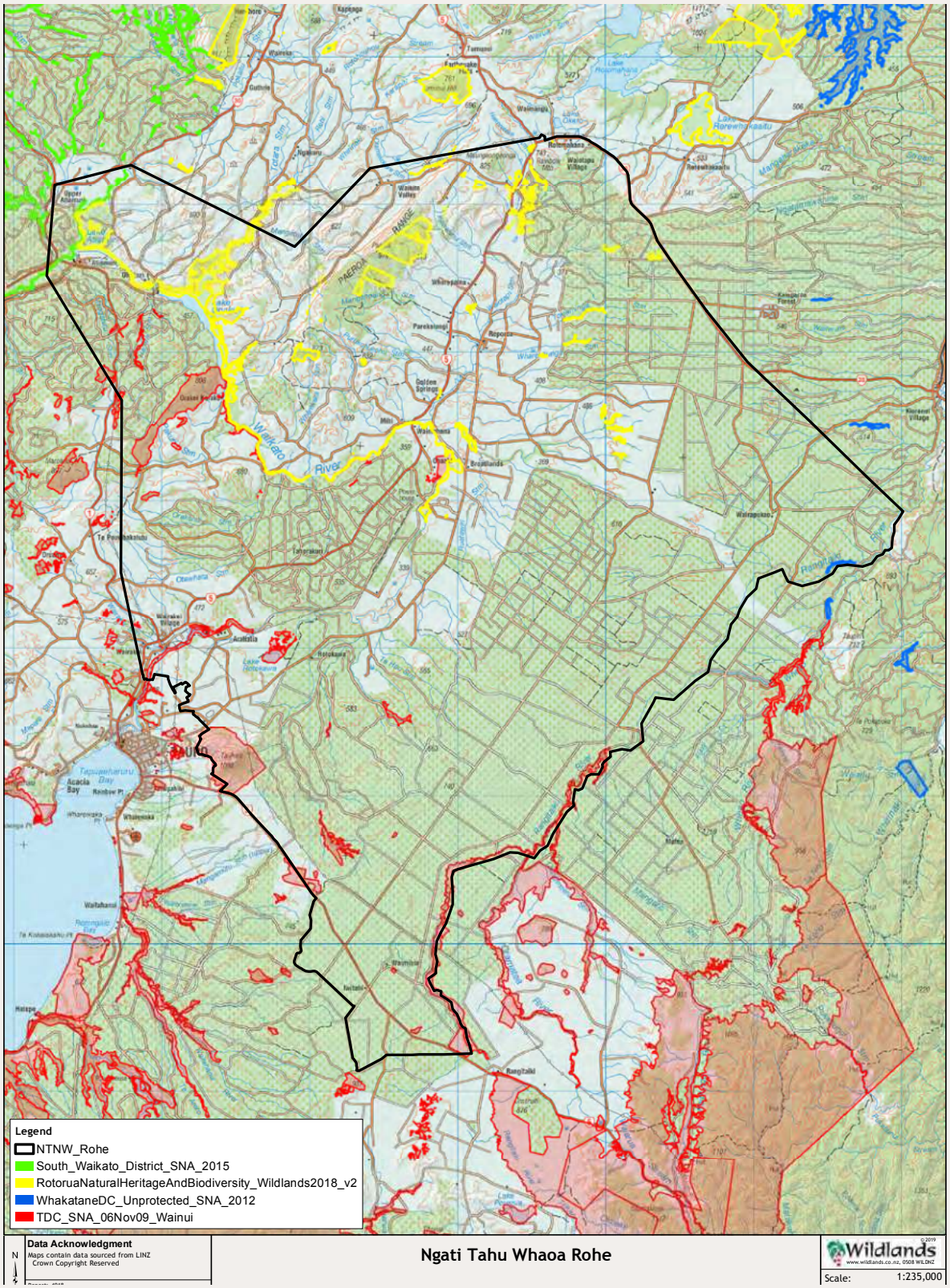
Several species of conservation significance occur in the rohe including short-tail bats, long-tail bats, falcons (karearea), *Dactylanthus* (pua o te reinga/ wood rose), mistletoes and geothermal plants. A significant population of *Dactylanthus taylorii* occurs in the Te Kopia reserve (Paeroa Ranges) and is under active management including caging for possum exclusion. The mistletoe Peraxilla tetrapetala is also found in the Te Kopia reserve, while another mistletoe Ileostylus micranthus occurs around Lake Ngahewa, with bands in place to prevent possum browsing.

Birds recorded from the rohe that are threatened or at risk include forest species like kokako, kiwi, and long-tailed cuckoo, and wetland species such as weweia (dabchick), matuku (bittern), matata (fernbird) and pueto (spotless crake). Mokomoko (lizards) include speckled skink and green gecko.

Geothermal vegetation is a nationally rare ecosystem type, given the limited extent of geothermal fields and the development of many sites which has altered and reduced the vegetation habitat. The geothermal areas of the rohe are home to several rare plants, including prostrate kanuka and a number of ferns, fern-like plants, mosses and club-mosses. For example, the fern Christella sp. 'thermal' is only known from 14 sites in New Zealand, many of which are in this rohe.

Biodiversity – the range of plant and animal life – is managed by a number of local and central government agencies, using several different ranking systems. Both DOC and WRC have criteria and classification systems for vegetation and ecosystems of significance. Taupo District Council (TDC) and Rotorua Lakes Council (RLC) have also identified Significant Natural Areas (SNAs), with 34 areas identified within the TDC part of the rohe and 24 areas identified within the RLC part of the rohe (see Map 10).

Map 10. Significant Natural Areas identified by district and regional councils within the Ngati Tahu-Ngati Whaoa rohe



These SNAs include wetlands, geothermal areas, indigenous forests, lakes, and riparian margins of rivers and streams. There is also one site (Iwitahi) which is a reserve for native orchids that are growing under exotic Pinus nigra pines.

Six areas within the Rotorua District are ranked as nationally significant:

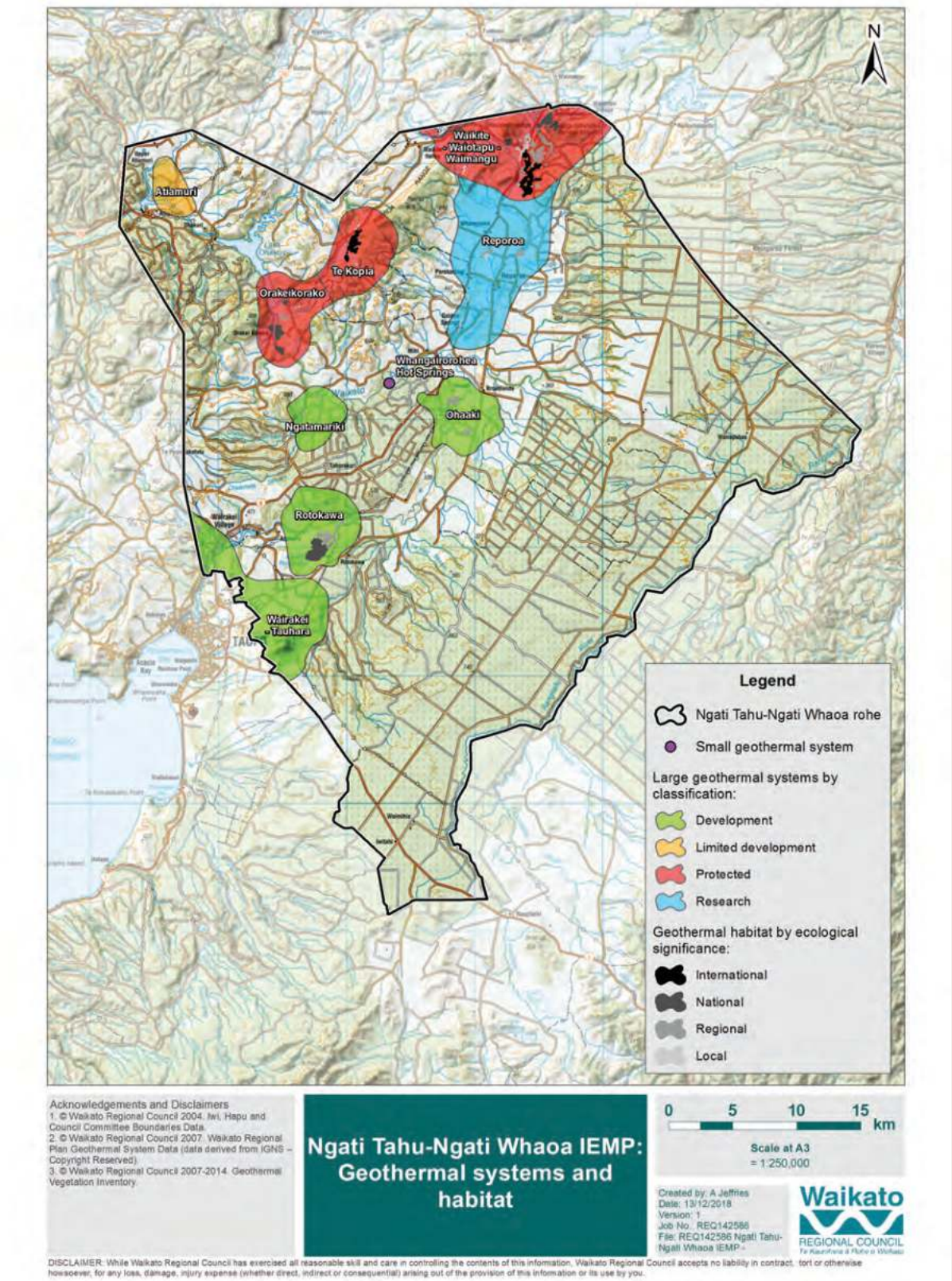
Lakes Ohakuri and Ngahewa

Geothermal areas at Red Hills, Orakei Korako, Waihunuhunu Stream, and Waikite Valley

TDC does not differentiate between nationally, regionally and locally significant areas, but their approach to SNAs and the rules and policies may change following their District Plan review.

Under the DOC system, two sites have national priority rating, due to their unique geothermal ecosystems. These are at Waikite (wet geothermal habitat) and Te Kopia Scenic Reserve (wet and dry ecosystems). WRC have also rated the significance of geothermal vegetation/ habitat and confirmed these ratings in 2015 (see Map 11). The two sites within the rohe ranked as internationally significant are at Te Kopia and Waiotapu. Nationally significant sites are found at Waikite, Waiotapu, Orakei Korako, and Rotokawa. The geothermal vegetation at Te Kopia (c56ha) comprises 10% of the remaining geothermal vegetation present in the Waikato Region and is second in size only to the Rotokawa site.

Map 11. Significant geothermal vegetation identified by Waikato Regional Council within the n Ngati Tahu-Ngati Whaoa rohe



A 2005 report to rate the values of DOC reserves in the Bay of Plenty ranked the Te Kopia Scenic Reserve as one of the North Island's most important reserves with a Botanical Conservation Rank of exceptional. This is due to the following features of the reserve:

the range of vegetation types represented

the substantial area of thermal vegetation present in an unmodified state

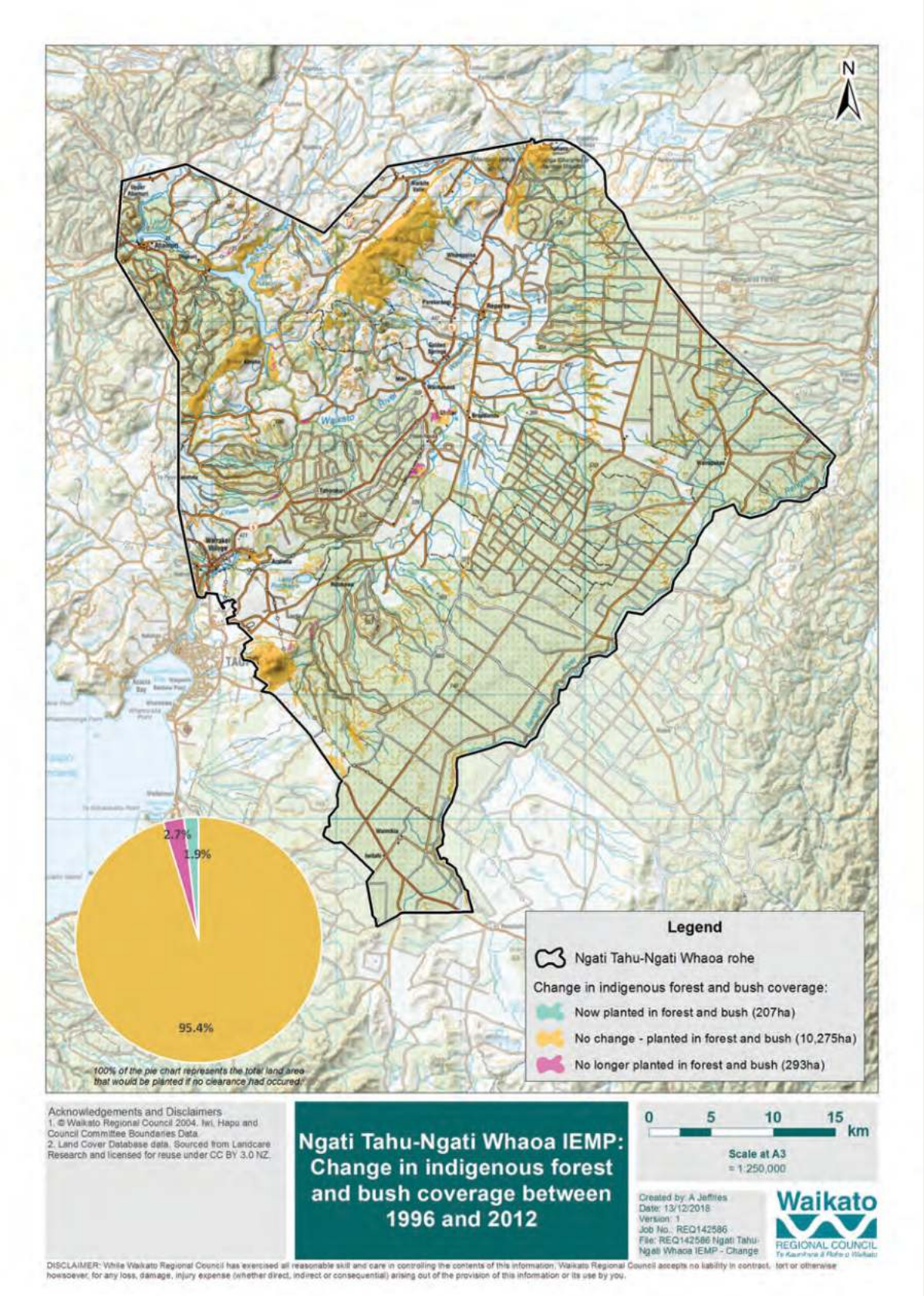
the remnants of a historically extensive forest area which formed the transition between hardwood forests present to the north of Rotorua and the podocarp forests to the south in the Taupo area

the relatively large size of the reserve for this area.

Since the early 1900s, 93% of the indigenous vegetation has been cleared from the rohe, and introduced species have become pests and predators. Some native species have been lost from the forests of the rohe. Most of the northern rata which was originally plentiful in the Paeroa Ranges has died, likely due to intensive possum browse in the past. According to DOC records, the last kiwi call was heard in the Paeroa Ranges in 2005. As populations decline, kiwi are less inclined to call.

The net area of indigenous forest cover across the rohe has been relatively constant in the period between 1996 and 2012 (see Map 12), with 293 ha of existing forest cleared, but 206 ha of new forest area established. The rest of the indigenous forest cover of 10275 ha remained unchanged.

Map 12: Change in extent of indigenous forest within the Ngati Tahu-Ngati Whaoa rohe (1996- 2012)



DOC has carried out 1080 operations in the Paeroa Ranges (Te Kopia Reserve) and instated a hunter's access track. WRC also carries out pest control on private land surrounding the Paeroa Ranges.

Pressures: What impacts on this resource

Land clearance and wetland drainage reduce the extent of habitat for native plants and animals. Remaining habitat areas become fragmented and disconnected, and are more prone to the effects of wind, livestock grazing and pest plant and animal invasion. Exotic and invasive species are a major threat to native plants and animals. New incursions add to pressure on native ecosystems – for example Dama wallabies are invading areas such as Te Kopia and Maunga Kakaramea as they move south from the Rotorua lakes. Pressure to develop geothermal fields for commercial purposes threatens the unique and rare habitat that exists in geothermal areas. Restoration of riparian areas and wetlands along the main Waikato River is constrained by the changes in water levels for hydro-electricity generation.

Specific threats to some of the rarer species include the following:

Pua o te reinga *(Dactylanthus)* is threatened by possums, pigs and deer

Threats to rare geothermal plants are changes to the geothermal heat (e.g. from geothermal development or land drainage), disturbance by people and machinery, grazing, trampling and rooting, tree-fall from harvested or wilding pines and other effects of weeds, including shading and competition

Threats to forest species like mistletoe and rata are possum and deer browse and vegetation clearance

Threats to wetland plants include grey and crack willows

Threats to bird species are possums, rats, feral cats, mustelids and dogs.

DOC has limited resources for working in sites that are not ranked as priority areas, so partnerships with the community are important to increase the extent of work that is done.

Turanga whakahaere - Principles for management of this resource

- Iwi want to see alternatives to 1080 and other toxins wherever feasible and as soon as possible
- Creating income – paid mahi – for iwi members is a priority
- The iwi supports planting of local genetic-sourced natives, including species with cultural uses as well as those that support native fauna
- For the iwi, harvest and use is important as well as protection and conservation
- Pest control should be strategic and consider multiple pests so that removal of one pest does not create an increase in another species or new risks to native species due to prey-switching
- Look after what is rare and special as well as generally increasing areas of native habitat
- Talk to local whanau when work is planned around their area
- On farm blocks, plant natives for environmental purposes and for future timber or other uses – the main thing is to plant
- Work towards co-management and co-governance between Crown and iwi

Whainga wa poto - Short-term goals	**Whainga wa roa - Long-term goals**
• Vegetation surveyed and identified • Rare and unique vegetation and animals protected and enhanced, and knowledge of them shared • Knowledge of traditional uses of plants increased and revived e.g. rongoa, kai harvested from the ngahere, weaving resources • Opportunities for a native plant nursery explored • Opportunities identified with DOC for work and skill-building for iwi, potential of iwi contribution seen • Improved access to natural areas • Gradual increase in extent and quality of native vegetation • Action taken on priority sites, with appropriate partnerships and projects • Damage from pests reduced in a strategic way • Alternatives to 1080 and other toxins investigated and trialled	• Tupuna tracks reinstated • Sanctuary/ effective restoration • Tui, kereru and other native bird numbers increasing around Reporoa, Ohaki, Parekarangi areas • Kiwi heard again on Paeroa Ranges • Iwi fully skilled, working in this area to full potential, contributions recognised • Local plant production or iwi nursery producing native plants eco-sourced from the area • Traditional plant and animal uses active again – rongoa, kai, weaving, feathers, etc • Alternatives to 1080 and other toxins found and used instead

Ma whero ma pango ka oti ai te mahi

With red and black the work will be complete
well-being for the people.

WHENUA – LAND AND LAND USE

Historical context: What we used to have

The customary lands of Ngati Tahu-Ngati Whaoa are represented by the rohe boundary, encompassing a total land area of 1947 km^2. In the past, native vegetation would have covered a much larger area, with cultivations and papakainga located strategically to take advantage of micro-climates and geothermal resources. Kai would have been sourced from these mara (gardens) as well as from the native bush, wetlands and waterways.

The statements in the Deeds of Settlement outline the effects of land alienation on the iwi (see Part I).

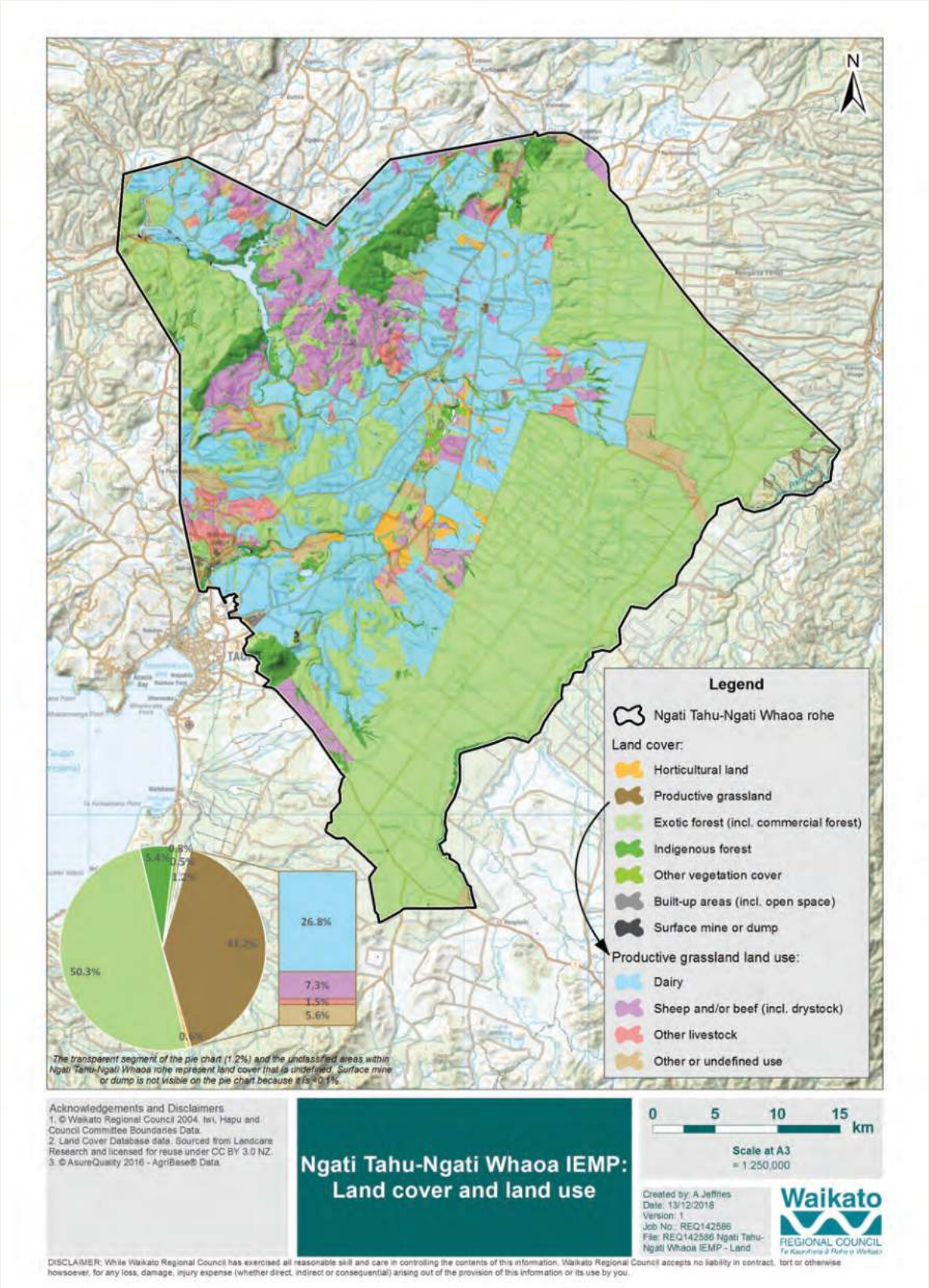
The soils of the rohe are of volcanic origin (pumice and ash). Bush sickness limited the expansion of livestock farming in the past, until 1935 when the cause was found to be cobalt deficiency. Large areas of forestry were established during the depression years on the Kaingaroa plains in the east of the rohe.

Settlement blocks around Reporoa were balloted to returned soldiers, and ballots continued under the Lands and Survey Department through to the 1970s. As farming established, erosion of the light pumice soils accelerated. A series of soil conservation schemes was put in place to remediate gullying in the area. Over time, $15 million was spent on this work in the Upper Waikato catchment. The areas protected by these schemes are still in place today.

Existing state: What we have now

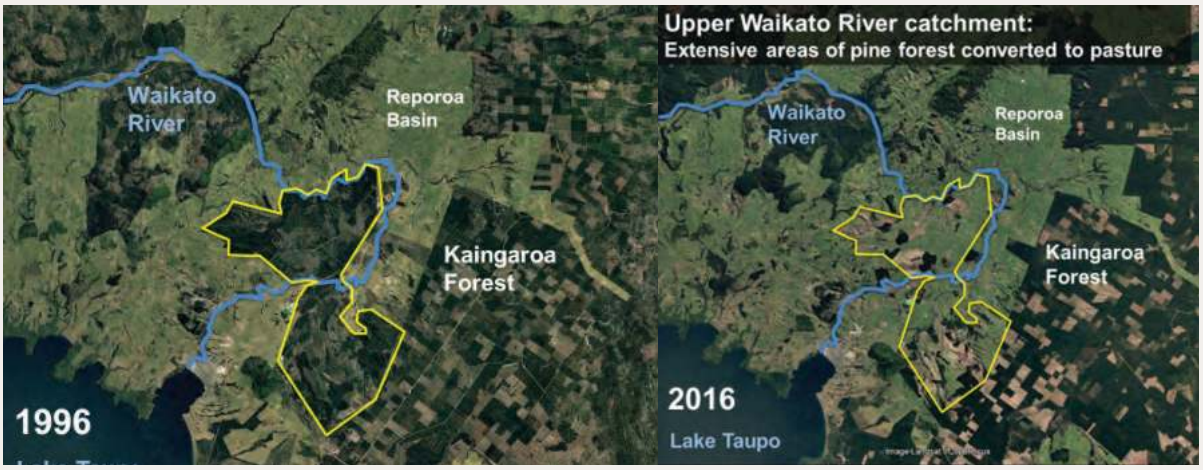
Current iwi land holdings represent 3% of the original Ngati Tahu-Ngati Whaoa blocks described by the Native Land Court (see Map 1). On the eastern side of the iwi rohe, exotic pine forest is the predominant land use of the Rangitaiki catchment headwaters. The extent of the Kaingaroa forest means that 55% of the entire Rangitaiki catchment is in plantation forestry, with a further 25% in indigenous forest along the Ikawhenua Ranges and Whirinaki forest areas. On the Waikato side, there is a mix of land uses in the rohe. Land use as of 2012 is shown on the graph and map (Map 13). In 2012 forestry covered 50% of the rohe. About two thirds of the pastoral land was in dairying (27% of the total rohe) and one third in other stock (14% of the rohe). Around 5% of the rohe was in indigenous forest.

Map 13: Land use within the Ngati Tahu-Ngati Whaoa rohe (as of 2012)



There has been an expansion of farming with a net 15897 ha of exotic forestry converted to pasture between 1996 and 2012 (see Map 14) and ongoing clearance can be seen in the photos in Figure 5. Under the Proposed Plan Change 1 (under the Healthy Rivers Wai Ora process), consent is now required to change land use if that change will result in greater loss of sediment, nitrogen, phosphorus or faecal microbes. This is controlling further conversions from pine to pasture in the Waikato catchment. Conversion of pine to pasture is still considered to be a risk to the upper Rangitaiki catchment.

Figure 5 Aerial photos from 1996 and 2016 showing extensive areas of pine cleared for pasture



Source: Stenger R, J Clague, B Moorhead, T McKelvey, U Morgenstern (2017). Nitrate assimilation capacity of shallow groundwater underlying dairy farms in the Reporoa Basin, New Zealand. International Interdisciplinary Conference on Land Use and Water Quality (LuWQ2017), The Hague, The Netherlands, 29 May – 1 June 2017.

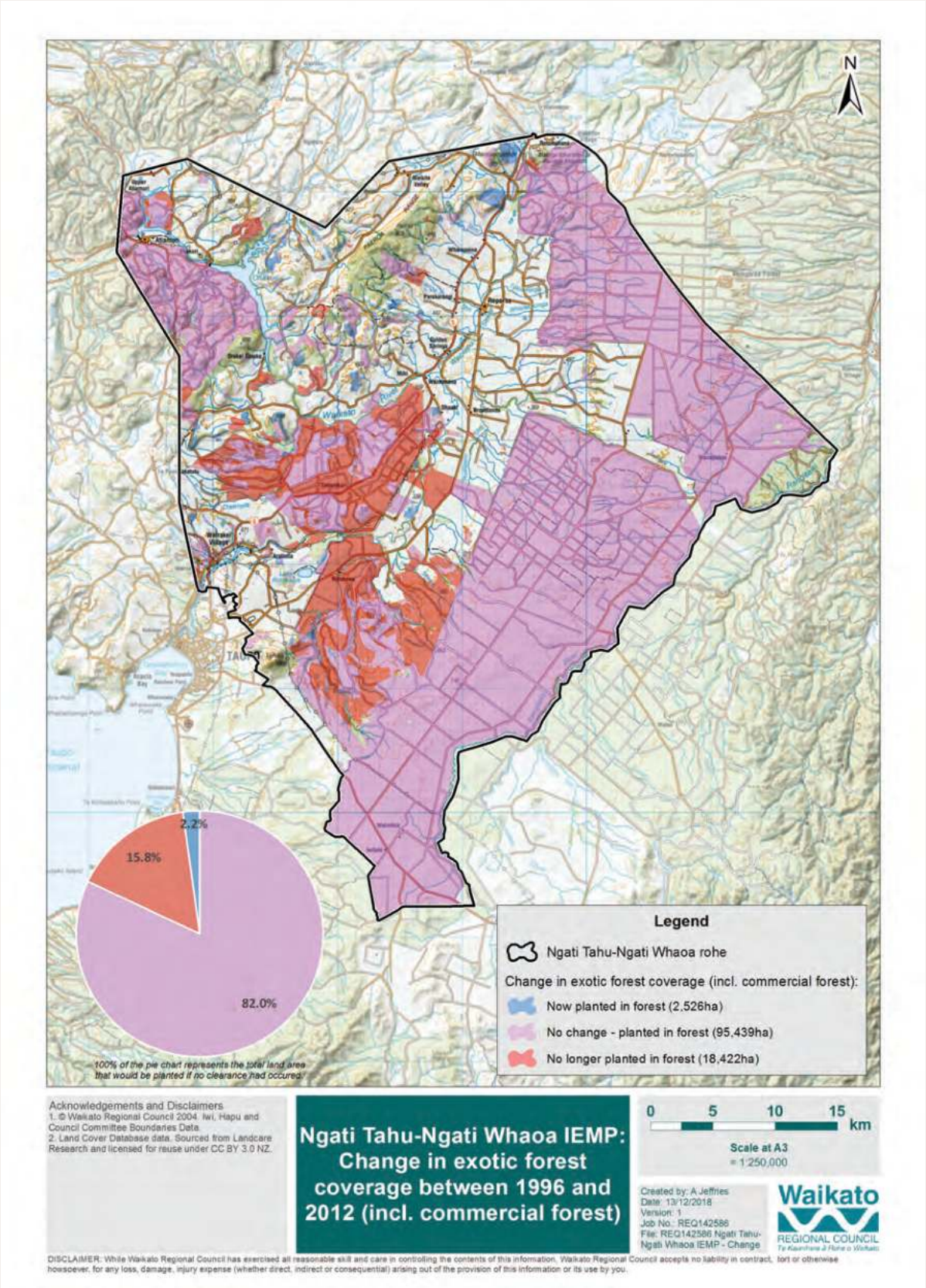
The soils of the rohe are light and free-draining. Because of this, the soils tend not to hold water so slips on hills are not common, but gullying is a concern. For this reason, much of the rohe is classed as having a severe risk of erosion. Soil conservation works such as fencing and planting have been established to protect gully heads and stream-banks. These schemes are now largely in place and are in maintenance phase, although there are still responses required to occasional gully formation events following intense rainfall.

The free-draining soils produce little overland flow except under heavy rainfall, so there is minimal direct run-off to waterways, but nutrients applied to the land can travel through the soil to reach groundwater and then move underground to reach surface waterways.

Iwi members have expressed concern about erosion, deforestation, use of sprays and stock in waterways. Dumping or burying of rubbish and car bodies is another issue affecting the land. Also of concern is the restricted access over private land to get to hunting blocks or to gather resources like watercress.

Soil conservation plantings in the past made extensive use of old varieties of exotic willow which have spread freely and become a pest plant in wetlands and small waterways. Iwi members are concerned there is still an over-reliance on exotic trees to control erosion.

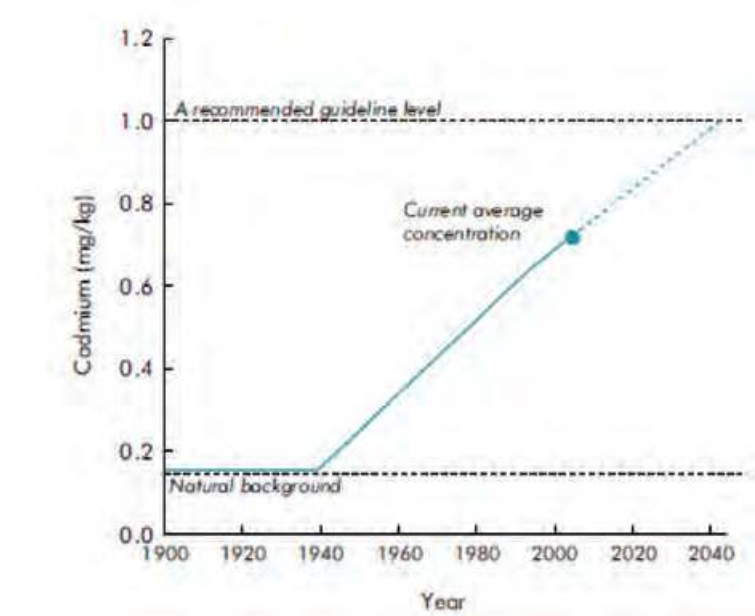
Map 14: Change in extent of exotic forestry within the Ngati Tahu-Ngati Whaoa rohe (1996- 2012)



There are increasing levels of the toxic substance cadmium in pastoral soils across the region. This is a trace element in phosphate fertiliser that is present in the natural phosphate rock.

The cadmium enters the soil as fertiliser is applied and is retained there, slowly accumulating. Over time, cadmium levels have been rising and this is a concern for the future for all pastoral soils where phosphate fertiliser is used (see Figure 6). Fluorine is another substance found in phosphate fertiliser that is accumulating in soils and may affect suitability for farming in future.

Figure 6: Cadmium accumulation in Waikato agricultural soils



Source: The condition of rural water and soil in the Waikato region 2010

Pressures: What impacts on this resource

The light soils of the rohe are prone to forming gullies and tomos in heavy rainfall. Land is most vulnerable where there is stock access and there are no trees stabilising the soil.

The rapid and frequent raising and lowering of the river for hydro-generation contributes to bank erosion and limits the potential for stabilisation plantings along the river edge. It also causes periodic flooding of land beside the river, and pooling of stagnant water.

Potential future electricity generation projects such as wind farms could have landscape effects and disturb wahi tapu, since many pa sites are on high points where the most reliable winds occur. The iwi would also have concern over any future proposal for nuclear development or disposal of toxic wastes on land in the rohe.

Mining and quarrying can have impacts if not managed carefully. Sulphur mining has damaged areas around Lake Rotokawa in the past, and there have been other 'desk-top' mining exploration permits issued around the rohe.

Toxic chemicals and hazardous substances applied to the land are a potential health risk. Cadmium accumulation is caused by the use of phosphate fertilisers. Different sources for the raw material contain varying amounts of cadmium, and formulations of phosphate fertiliser have different quantities of cadmium in them, e.g. reactive phosphate rock (RPR) has lower cadmium levels than superphosphate. Other current chemical use is mostly for weed management, and toxins are also employed for pest animal control. Currently there are no genetically modified organisms grown in the rohe.

Conversion from pine to pasture results in soil compaction and therefore faster runoff. This may contribute to short-term flood peaks and localised flooding damage. Large-scale conversion to pasture also has effects on water quality and greenhouse gas emissions (see sections on Wai and Rangi).

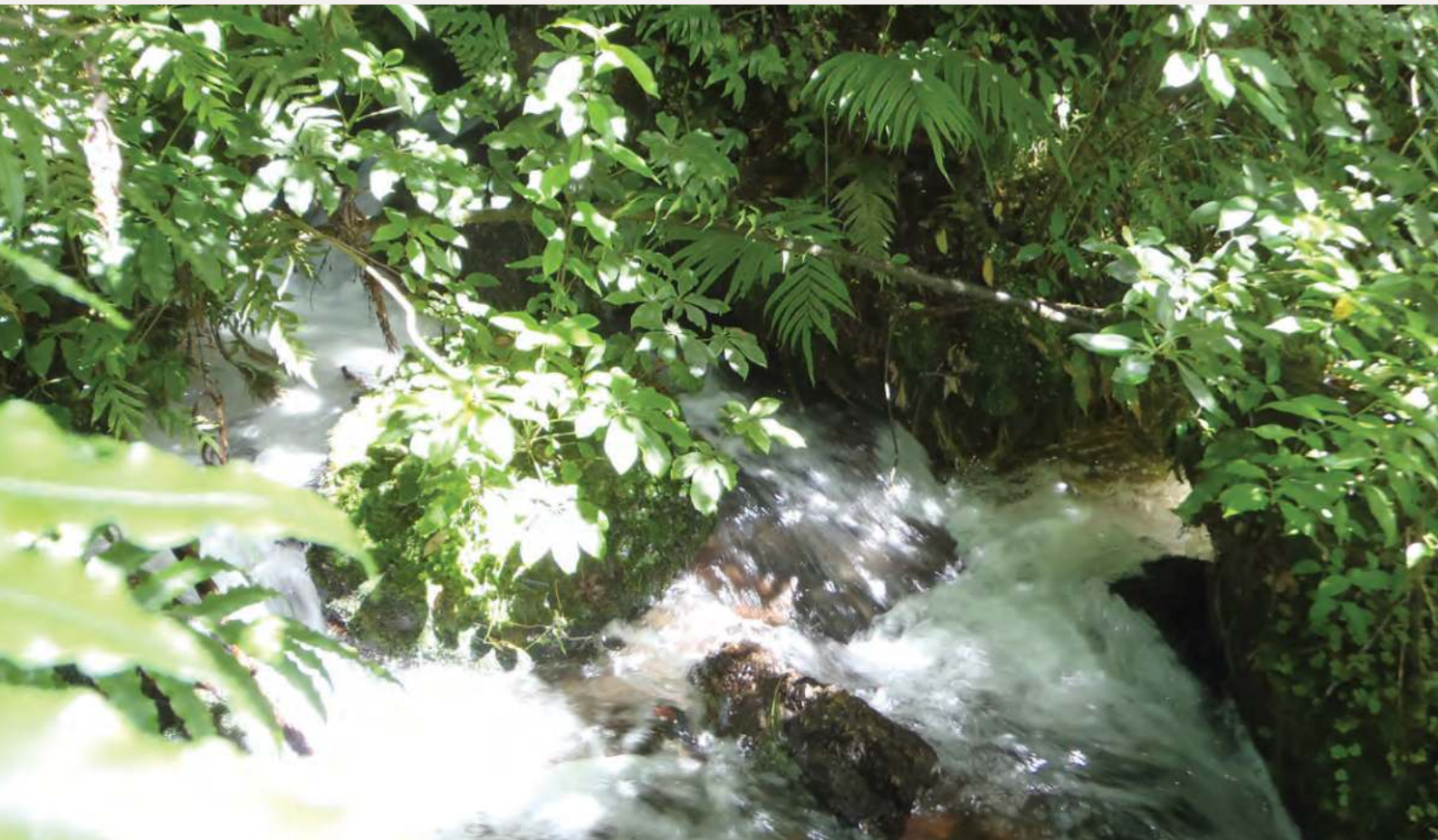
Much of the land that is being returned to the iwi through settlements comes with conservation restrictions or liabilities for forest clearance under the Emissions Trading Scheme.

The opportunity for iwi to make use of land as papakainga to house people coming back may also be restricted by planning rules.

Turanga whakahaere - Principles for management of this resource

- The iwi has dual goals in production and kaitiakitanga – we want to be responsible stewards leading by example in good management, and produce benefits for the iwi
- We need to stay informed and understand the resource and changing context, keeping shareholders informed
- Take an intergenerational view of planting indigenous trees on the land – one generation plants, another harvests
- Land should be used according to its capability - tree cover is preferable on erosion-prone land and headwaters, to reduce sediment and flooding
- Tree cover also has benefits for the climate; this should be recognised through appropriate economic incentives for trees
- Building on land in natural hazard areas should be avoided where possible, rather than trying to mitigate or adapt later
- The iwi should be consulted on any initiatives to mine or quarry, or otherwise disturb land in the rohe
- Siting of wind farms and other infrastructure should avoid wahi tapu and significant sites to the iwi
- Irreversible effects to the soil should be avoided, including accumulation of toxic chemicals like cadmium
- Genetic engineering represents interference with whakapapa and an unacceptable risk; it should be avoided to preserve intrinsic values of life-forms and to protect New Zealand's competitive advantage in producing pure products
- Land to water linkages are important – keep headwaters of streams protected under native bush, all waterways should be fenced/ stock excluded
- We need to recognise the special areas on our properties: wetlands, native areas, geothermal features, wahi tapu/ sites of significance – initiate the projects and get them off the ground, to enhance and give back to the land
- Good environmental management should be reflected in premium prices - iwi voices should be heard in industry bodies e.g. levy bodies, meat companies
- Land management should aim for productivity, sustainability, continuity – a viable proposition. This means:
- Taking the long-term view
- Sustainable , environmentally-friendly farming that does not degrade resources
    - Knowing/ understanding what we have – connections, risks, opportunities, productive potential
    - Being able to develop efficiently and effectively on an ongoing basis
    - Productivity not necessarily from more animals, but better quality, better lambing percentages, heavier animals – achieving top dollar for the product
    - Using nitrogen efficiently
    - Using water efficiently (links with Wai)
    - Getting best use of each piece of land, focusing on better land for production
    - Relying on our own resources where possible

Whainga wa poto - Short-term goals	Whainga wa roa - Long-term goals
• Nursery options investigated • Iwi blocks have farm environmental plans in place (future road map); land is used within its capability and for its most appropriate use • Iwi blocks managed using best practice • Waterways fenced • Farm rubbish and chemicals well managed • Rate of toxic chemical accumulation in the soil slowed (e.g. cadmium from fertilisers)	• More land returned to iwi ownership • Land providing resources, income and wellbeing for the iwi and others, without environmental degradation • Soil fertile and suitable for growing hua whenua and hua rakau (vegetables and fruit), mara kai (food gardens), and enhancing wellbeing • Zoning of land allowing for papakainga development • All land, all waste and all hazardous chemicals in the rohe managed according to best practice; no accumulation of toxic chemicals in the soil • Nursery growing trees for replanting • Less land clearance, more areas in native vegetation, succession planting in place for future generations • Improved access for iwi to kai resources and to significant sites/ wahi tapu



MAHI NGAHERE – FORESTRY

Historical context: What we used to have

In the past, the milling of native timber was an important local industry, providing whanau with employment. There are reports that at one point in time, the milling settlement at Tutukau was bigger than Taupo township. E.E. Vaile wrote in Pioneering the Pumice in 1939: "When I first went to Broadlands the totara forests were vast plains, and the great towering trees, many of them up to seven feet in diameter, stood so close together that they seemed to present an impenetrable wall. Gradually, fires made most serious incursions on these wonderful resources... Now streams of heavy lorries day by day and at all hours of the day and night convey the timber to Hawkes Bay and Rotorua, the Waikato, and Auckland."

The beginnings of the Kaingaroa forest were planted at Waiotapu in 1901 and large-scale pine planting began in 1913, with prisoners working as planters between 1900 and 1920. Planting of the pumice country of the upper Waikato and Rangitaiki catchments continued through the 1920s and 1930s. Much of the total 189,000 ha Kaingaroa forest (the largest exotic forest in the North Island and largest softwood plantation in the southern hemisphere) is now growing its third crop of trees. The Kaingaroa State Forest was owned as a state asset until the 1980s, when the government sought to sell the forests to private interests. Several iwi went to Court to prevent the sale of the land. It took twenty years to reach settlement of those claims and to see the lands returned to iwi owners.

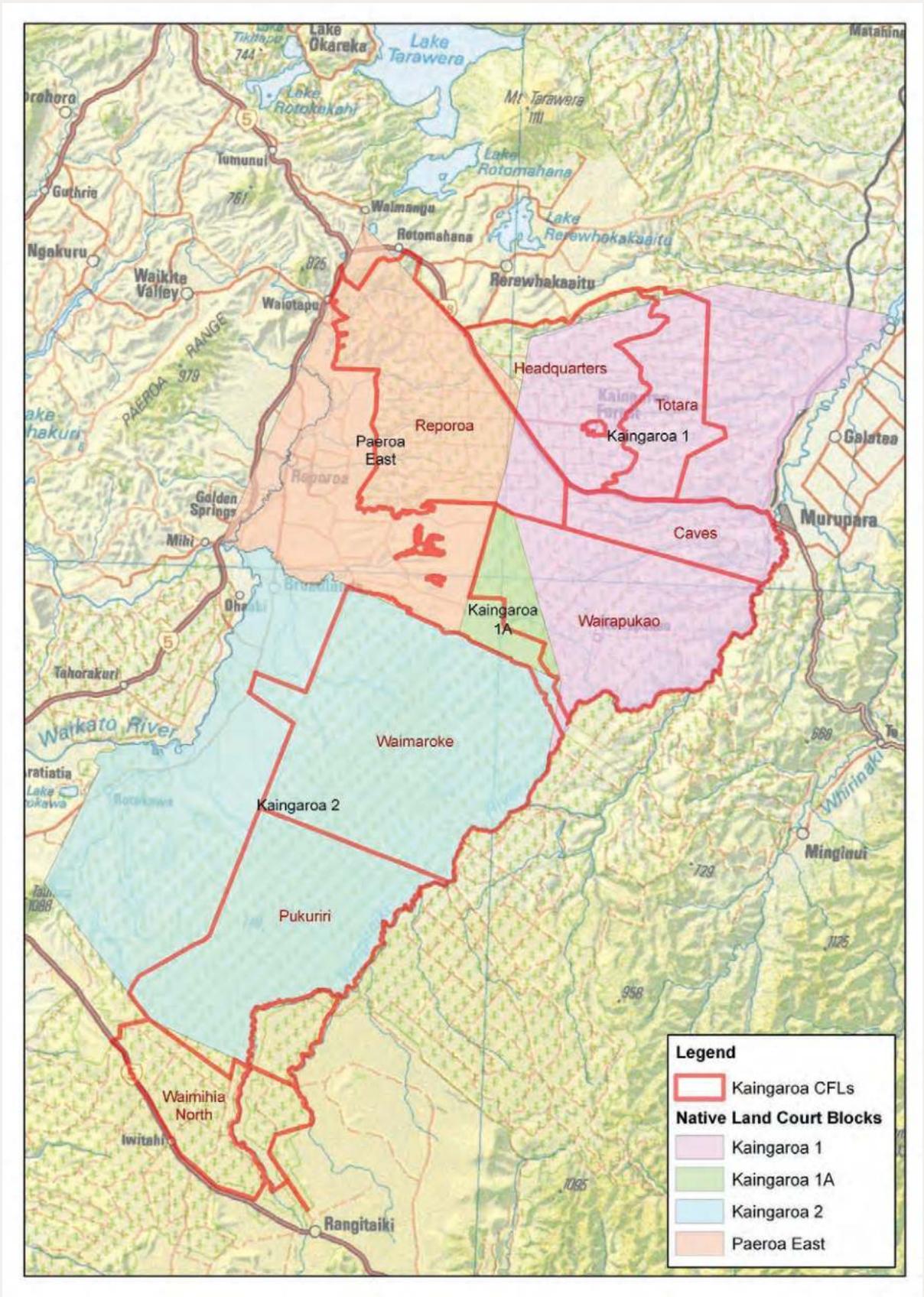
On 1 July 2009, the land passed to a group of iwi in partial settlement of their claims, however due to further cross-claims, further negotiations were required to determine which iwi hold mana whenua over these Central North Island (CNI) forests.

Forestry came under the Emissions Trading Scheme on 1 January 2008. It was the first sector to enter, because of the importance of forestry to New Zealand's ability to meet its international obligations for greenhouse gas emissions. There was a rapid rate of deforestation leading up to this date. After January 2008, conversion to pasture slowed down substantially until the price of carbon dropped sharply. Conversions then picked up again (see Map 14 and Figure 5), until the notification of Waikato Regional Plan Change 1 (Healthy Rivers Wai Ora).

Existing state: What we have now

Mana whenua status over the Central North Island forests has been adjudicated and Ngati Tahu-Ngati Whaoa have been recognised to have mana whenua status in four of the nine Crown Forest Lands (CFL) blocks of Kaingaroa forest that were referred to the adjudication panel (see Map 15). Ngati Tahu-Ngati Whaoa were found to have a substantive interest (based on a clear exercise of mana whenua in a clearly demarcated and unimpeded area) in the Wairapukao and Reporoa CFL blocks, and a limited interest (mana whenua that is recognisable but limited in extent and reach) in the Totara and Headquarters CFL blocks.

Map 15: Kaingaroa Crown Forest Land (CFL) and Native Land Court blocks



The actual trees of the Kaingaroa forest are owned by a private company (Kaingaroa Timberlands Ltd), which holds a forestry licence over the land. There are also other companies in the rohe involved in forestry operations. Some forestry companies operate under Forest Stewardship Council (FSC) certification, a voluntary process for verifying responsible forest practices. To gain and maintain this certification, forest managers must prove their operations:

are environmentally sustainable

enhance the social and economic well-being of workers and local communities

identify and uphold indigenous people's legal and customary rights of ownership, use and management of land, territories and resources affected by management activities.

There are many wahi tapu in forest areas but they may not be known by forest companies or their contractors. Forest blocks also have biodiversity values which may include the presence of native bats, birds such as karearea and native vegetation and wetland areas. Recent surveys carried out by the iwi with DOC found long-tail bats in Tutukau forest.

The limitations on conversion of forest to different land uses are at both regional scale (changes to the Waikato Regional Plan) and national (under the Emissions Trading Scheme (ETS)). With the new rules proposed under Waikato Regional Plan Change 1 (Healthy Rivers Wai Ora), the conversion of forest to pasture has been controlled in the Waikato catchment, as any change of land use must show no net increase in loss of sediment, nitrogen, phosphorus or faecal microbes. No such rules apply in the upper Rangitaiki, but limit-setting processes are now underway there. Approximately 55% of the entire Rangitaiki catchment is in plantation forestry, including the area within the iwi rohe. Under the ETS, owners of forests planted pre-1990 face obligations under the scheme if they deforest. Owners of these forests can receive a one-off allocation of credits to help offset the decrease in land value and land-use flexibility. Old-growth indigenous forest that remains in forest is not subject to the rules of the ETS. New forests that are registered under the scheme to earn carbon credits will have to remain in forest cover or pay the emissions cost of conversion back to pasture in future.

Pine forestry as a land use creates less erosion and sediment runoff, and much less nitrogen leaching, than pasture. However, when forestry is harvested there is a surge in sediment loss that returns to base level over several years as trees re-establish. Over the entire life cycle of a pine forest, forestry produces 1.5 to 5 times less sediment loss to waterways than pasture.

Recreational hunting and fishing in forest blocks requires a permit, and access is closed during high-risk fire periods. Iwi members are concerned about access to areas of native forest and planted forest, and also maintaining access once forests are converted to pasture (for example to waterways to collect kai). Iwi members are interested in being involved in patrolling forest areas.

Other concerns for iwi members are around the impacts of forest harvest on run-off and erosion, management of wahi tapu, and whether there is sufficient area of native forest. There is also a desire for forestry to provide local employment.

Pressures: What impacts on this resource

When the price of carbon is low, deforestation incurs a lower cost under the ETS. Under this scenario the comparative profitability of other land uses makes pine-to-pasture conversion attractive. However, actual opportunities for conversion may be limited by other constraints such as water allocation limits or rules preventing an increase in contaminant losses (e.g. rules proposed under Healthy Rivers Wai Ora/ Waikato Regional Plan Change 1).

The amount of actual sediment loss during pine harvest is dependent on weather conditions at and shortly after harvest, and the techniques used. Important practices include siting tracks and earthworks away from waterways and on stable ground, hauling trees up the slope rather than pushing them downwards, and leaving riparian strips of undisturbed vegetation next to waterways and wetlands.

Indigenous habitats within pine forests, including geothermal areas and wetlands are affected by animal pests, wilding pine incursion and earthworks and harvest impact. Significant sites and wahi tapu may also be disturbed by earthworks and harvest activity.

Turanga whakahaere - Principles for management of this resource

- Access is important for iwi to reach kai sources and for hunting
- Wahi tapu should be set aside with no commercial forestry planting or harvesting of these areas
- Shared information and understanding between parties is critical to enhance management of cultural sites in forests
- Best management practice should ensure the impacts of forestry tracking and harvest are minimised, to get the environmental gains of forestry as a lower-impact land use than pasture
- Light pumice soils are prone to gullying, so soil conservation measures and tracking and harvesting plans should be prepared, implemented and monitored
- Iwi should be consulted for major consented works in forestry areas that may disturb sites e.g. earthworks and tracking
- Forest areas can be habitat for native species and should be managed for biodiversity as well as economic purposes – for example, considering the role of old trees as habitat for bats and falcons
- Iwi want to participate in economic development opportunities from forests returned under settlements
- Forests can and should be managed to provide environmental, cultural, economic and social outcomes, which are recognised under forest stewardship schemes – iwi involvement should be a central basis to gain and maintain this certification
- Iwi and forestry operators should work together to ensure opportunities for restoration (mahinga kai, wahi tapu, corridors, wetlands etc) are extended into suitable forestry areas

Whainga wa poto - Short-term goals	**Whainga wa roa - Long-term goals**
• Interests in Central North Island forests recognised; benefits flow to the iwi • Improved access through forest blocks to kai sources and to significant sites • All forestry operators using best practice for tracking, planting and harvesting operations • MOU in place with all major forest operators in the rohe, wahi tapu identified and recognised by those companies • Harvesting on Ngati Tahu-Ngati Whaoa lands efficiently coordinated with neighbouring forestry operations	Iwi managing, gaining employment and benefitting from forest assets Larger areas of native forest cover established; succession plantings available for future generations Wahi tapu in forest areas marked and managed sensitively by forestry companies and their contractors, with full involvement of the iwi Iwi historical knowledge of significant sites within forestry areas retained and built on Cultural and ecological values restored and protected at a range of sites in forested areas

RANGI – AIR AND ATMOSPHERE

Historical context: What we used to have

Air has always been clean in the rohe, although geothermal activity would have created localised natural discharges in the past.

Existing state: What we have now

Air quality in the rohe is still presumed to be high although it is not monitored. Air quality monitoring is in place in nearby cities (Rotorua, Taupo, Tokoroa), all of which have air quality issues at times in winter. However, this is not considered a risk to the air quality within the rohe.

There are consents to discharge to air associated with industrial sites in the rohe such as the geothermal stations and agricultural and timber processing.

Climate change is of concern globally, with rising levels of carbon dioxide and other warming gases in the atmosphere and the risk of more severe and destabilised weather patterns. Current government policy is to increase tree planting and sharply decrease national emissions.

Pressures: What impacts on this resource

Air quality may be impacted by industrial discharges and by residential burning for domestic heating. The low density of both of these in the rohe means there is little current pressure on air quality.

Natural geothermal activity can release poisonous gases such as hydrogen sulphide, and geothermal electricity developments are associated with release of these gases.

Human-induced climate change is driven by accumulation of gases that create a warming effect in the atmosphere. These include carbon dioxide, nitrous oxide and methane. Carbon dioxide is released from burning fossil fuels and deforestation, and there is some carbon dioxide released during geothermal fluid extraction for electricity. Nitrous oxide is released by soil processes and natural wetland reactions and also affected by nitrogen fertiliser and effluent practices. Methane is produced by ruminant animals and from landfills.

Iwi members have expressed concern about the impacts of wifi and transmitters/electromagnetic frequencies in the atmosphere.

Turanga whakahaere - Principles for management of this resource

- Climate change must be taken seriously as it will cause an increase in climate extremes (drought and storm intensity)
- Emissions control measures should reward, rather than penalise forest owners, as forest cover has multiple benefits for land, water, air and biodiversity
- Bio-fuels show promise as a carbon neutral land use that can reduce emissions from fossil fuels
- Clean air is basic for human health; the current clean air in the rohe should be protected
- Sensitivity towards the impacts of wifi and transmitters in the atmosphere should be respected

Whainga wa poto - Short-term goals	Whainga wa roa - Long-term goals
• Local reduction in emissions • Effective advocacy for equitable climate change policy • Clean air retained in the rohe	• Climate stable for future generations – e.g. CO_2 below 350 ppm • Clean air supporting health of iwi members

APPENDIX 1 – VISION AND STRATEGY FOR THE WAIKATO RIVER/ TE TURE WHAIMANA O TE AWA O WAIKATO

1 Vision

(1) Toku awa koiora me ona pikonga he kura tangihia o te matamuri. The river of life, each curve more beautiful than the last.

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

(3) In order to realise the vision, the following objectives will be pursued:

- (a) the restoration and protection of the health and wellbeing of the Waikato River:
- (b) the restoration and protection of the relationships of Waikato-Tainui with the Waikato River, including their economic, social, cultural, and spiritual relationships:
- (c) the restoration and protection of the relationships of Waikato River Iwi according to their tikanga and kawa with the Waikato River, including their economic, social, cultural, and spiritual relationships:
- (d) the restoration and protection of the relationships of the Waikato Region's communities with the Waikato River, including their economic, social, cultural, and spiritual relationships:
- (e) the integrated, holistic, and co-ordinated approach to management of the natural, physical, cultural, and historic resources of the Waikato River:
- (f) the adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River and, in particular, those effects that threaten serious or irreversible damage to the Waikato River:
- (g) the recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within the catchment on the health and wellbeing of the Waikato River:
- (h) the recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities:
- (i) the protection and enhancement of significant sites, fisheries, flora, and fauna:
- (j) the recognition that the strategic importance of the Waikato River to New Zealand's social, cultural, environmental, and economic wellbeing requires the restoration and protection of the health and wellbeing of the Waikato River:
- (k) the restoration of water quality within the Waikato River so that it is safe for people to swim in and take food from over its entire length:

- (l) the promotion of improved access to the Waikato River to better enable sporting, recreational, and cultural opportunities:
- (m) the application to the above of both matauranga Maori and the latest available scientific methods.

2 Strategy

- To achieve the vision, the following strategies will be followed:
    - (a) ensure that the highest level of recognition is given to the restoration and protection of the Waikato River:
    - (b) establish what the current health status of the Waikato River is by utilising matauranga Maori and the latest available scientific methods:
    - (c) develop targets for improving the health and wellbeing of the Waikato River by utilising matauranga Maori and the latest available scientific methods:
    - (d) develop and implement a programme of action to achieve the targets for improving the health and wellbeing of the Waikato River:
    - (e) develop and share local, national, and international expertise, including indigenous expertise, on rivers and activities within their catchments that may be applied to the restoration and protection of the health and wellbeing of the Waikato River:
    - (f) recognise and protect wahi tapu and sites of significance to Waikato-Tainui and other Waikato River iwi (where they do decide) to promote their cultural, spiritual, and historic relationship with the Waikato River:
    - (g) recognise and protect appropriate sites associated with the Waikato River that are of significance to the Waikato regional community:
    - (h) actively promote and foster public knowledge and understanding of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community:
    - (i) encourage and foster a “whole of river” approach to the restoration and protection of the Waikato River, including the development, recognition, and promotion of best practice methods for restoring and protecting the health and wellbeing of the Waikato River:
    - (j) establish new, and enhance existing, relationships between Waikato-Tainui, other Waikato River iwi (where they so decide), and stakeholders with an interest in advancing, restoring, and protecting the health and wellbeing of the Waikato River:
    - (k) ensure that cumulative adverse effects on the Waikato River of activities are appropriately managed in statutory planning documents at the time of their review:
    - (l) ensure appropriate public access to the Waikato River while protecting and enhancing the health and wellbeing of the Waikato River.

Part III. Hei mahi -

IMPLEMENTATION AND ACTIONS

Contents

WHAKATAKINGA - INTRODUCTION

This document should be read in conjunction with Part I and Part II of R*ising above the mist: Te aranga ake i te taimahatanga* – Ngati Tahu-Ngati Whaoa Iwi Environmental Management Plan (IEMP).

The IEMP consists of three parts. Part I sets out the background, history, vision and overarching ethos for environmental management. Three approaches that relate to all resources across the rohe are identified (Recognition and representation, Positive relationships and Engaging rangatahi), and pathways to progress these approaches are defined. Part II of the plan explains the historic and current state regarding particular taonga of the natural environment, and sets out principles for management, short-term goals and long-term goals for each resource.

This document, Part III of the plan, focuses on actions that will implement Parts I and II. Part III is presented as a separate component of the plan, collating actions together so it is easier to plan implementation and monitor progress. Any updates will be posted to the website of the Ngati Tahu-Ngati Whaoa Runanga Trust website:

www.tahu-whaoa.iwi.nz

Some highlights are presented for each of the three overarching approaches outlined in Part I (Recognition and representation, Positive relationships and Engaging rangatahi). This is followed by a progress report and an action plan for each taonga or natural resource featured in Part II, which includes:

Opportunities: How to preserve and restore the resource

Progress since 2013 (the publication of the original IEMP)

Current actions

Ideas for future actions

Snapshots are also provided of examples of good practice being undertaken within the rohe.

Ara - Approaches

Part I of Rising above the mist: Te aranga ake i te taimahatanga identifies three approaches to environmental management that relate to all resources throughout the rohe: Recognition and representation, Positive relationships and Engaging rangatahi.

In this section, some highlights are identified showing how each approach is being enacted.

Approach/ pathway	*Enacting this approach*	*Who else is involved*
Recognition and representation		
Recognition of Ngati Tahu-Ngati Whaoa through any future negotiations on rights and interests in water (including geothermal fluid), land, forests and other taonga within the rohe.	Ngati Tahu-Ngati Whaoa inclusion in the Mana Whenua process for Central North Island forests	Other Central North Island iwi
Direct consultation with the iwi (i.e. not via TARIT or other entities created through settlement processes) on plans and operational matters pertaining to the rohe including regional and district plans, policies, strategies, priorities, projects, work-plans, consents and compliance monitoring.	Pursuing Mana Whakahono – a new provision under the RMA to confirm agreements with Councils on how they will work with Ngati Tahu-Ngati Whaoa as an iwi	Regional and District Councils

Snapshot: Recognition of mana whenua status in Central North Island forests

As an iwi, Ngati Tahu-Ngati Whaoa has been recognised to have mana whenua status in four of the nine Crown Forest Lands (CFL) blocks of Kaingaroa forest that were referred to an adjudication panel. After the return of Central North Island (CNI) forest land from the Crown to CNI Iwi Holdings Ltd in 2009, a Mana Whenua process was followed to determine the interests of eight iwi in the CNI forest blocks. An independent adjudication panel was appointed to review all evidence and come to a decision about 9 CFL blocks. The Runanga engaged in preparing and filing evidence and replying to other iwi evidence, making presentations and attending site visits with the adjudication panel, and holding a range of hui including hui-a-iwi and hui with other iwi entities. The adjudication panel delivered its decision in 2014. The panel found that Ngati Tahu-Ngati Whaoa have a substantive interest in the Wairapukao and Reporoa CFL blocks, and a limited interest in the Totara and Headquarters CFL blocks. A substantive interest is based on a clear exercise of mana whenua in a clearly demarcated and unimpeded area, while a limited interest is based on a clear exercise of mana whenua that is recognisable but limited in extent and reach.

Positive relationships		
Foster good relationships with other resource users, large forestry companies, and major agricultural operations in the rohe. Develop and implement protocols, working documents, relationship agreements or MOU where relevant to achieve aspirations and goals. Continue to develop the working relationship with DOC in the rohe based on the current MOU – including input on an annual basis to work plans in the rohe and a collaborative approach to major projects.	• Working with Landcorp to ensure significant sites are identified on lands being converted from pine to pasture, so farming operations are not carried out on these sites	Landcorp Wairakei Pastoral
	• Implementing a comprehensive MOU with DOC to guide activities and the working relationship	DOC
	• An MOU with GNS developed and currently being implemented	GNS
	• An MOU with Fonterra Reporoa developed and currently being implemented	Fonterra
Establish/ attend a Forum (or several) for sharing resource information and planning future projects as an iwi. These could be resource-specific e.g. geothermal, or land and water, or for general planning as an iwi.	• Iwi participation in annual peer review panel discussions regarding operation of geothermal stations and the Waikato River hydro system in relation to resource consents and geothermal field and river management	Waikato Regional Council Contact Energy Rotokawa Joint Venture Mercury
	• Runanga represented on Upper Waikato Zone catchment committee	Waikato Regional Council
Undertake restoration projects together to build relationships. Utilise existing funding and partnerships to leverage new projects. Engage and upskill iwi members and involve rangatahi. Continue to develop the working relationship with DOC in the rohe based on the current MOU – including input on an annual basis to work plans in the rohe and a collaborative approach to major projects.	• Ngatamariki – development of restoration plan using catchment approach across all relevant landowners*	DOC, Wairakei Estate, and other landowners and stakeholders
	• 3 Lakes Group– working group of all agencies established for Lakes Ngahewa, Ngapouri and Tutaeinanga. Large restoration project underway working primarily with Fish and Game at Ngapouri and Tutaeinanga, re-establishing over 4 ha of riparian vegetation	Fish & Game, DOC, Te Arawa Lakes Trust, Waikato Regional Council
	• Development and implementation of a comprehensive Waiotapu weed management plan across the wider geothermal field *	Timberlands, DOC
	• Seed collection on forest blocks in response to myrtle rust threat	DOC
Build capacity by developing iwi members' skills to be involved in environmental projects in the rohe (such as researching, project planning and grant-seeking, restoration and conservation skills etc).	Nga Tohu o te Taiao – involvement of iwi members to assist in development of cultural freshwater indicators and share iwi knowledge (see Wai section)	NIWA, University of Waikato, Landcare Research,Waikato-Tainui

* Identified as an iwi priority project in Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa

Snapshot: Building a strong relationship between Landcorp Pastoral and Ngati Tahu-Ngati Whaoa

Landcorp Pastoral is a group of twenty farms adjoining Te Toke Marae. Since Landcorp Pastoral's formation in 2003, an on-going and progressive relationship has been built with Ngati Tahu-Ngati Whaoa, sharing cultural events, hui, powhiri, and mental health awareness meetings. Landcorp appreciates and makes frequent use of the facilities at Te Toke Marae. Recent uses of the marae include a cultural gathering (60 people), hosting international agribusiness specialists (100 people) and a dairy assistants' day (40 people). Bruce Hunter of Landcorp says "Te Toke Marae is a place where we have always been received warmly and in friendship. We will continue to use these resources to properly host our guests and showcase an iwi relationship we are very proud of."

Bruce Hunter identifies several values held mutually by Landcorp and Ngati Tahu-Ngati Whaoa, around people, family, wellbeing, environment and turangawaewae. He also sees the Ngati Tahu-Ngati Whaoa Iwi Environmental Management Plan as consistent with their own, in that it is "industry leading with genuine intent to protect our valuable ecosystems, and consideration for historical and cultural interests".

Engaging rangatahi		
Hold camps, education programmes, celebrations and activities to strengthen identity and connection for rangatahi e.g. marae-based education, cooking and bathing in ngawha, collecting customary kai and rongoa, learning traditional crafts. Build the confidence of post-school rangatahi to transition into environmental management and local careers. Look for opportunities for internships or working alongside experts.	• Marae-based education programme for rangatahi engaging them in a range of activities to enrich learning and strengthen their identity	Ministry of Education
	• Two Mahinga kai wananga held to share work and knowledge on tuna and koura	Various project partners (project-related)
	• Fonterra provided expertise in a wananga for rangatahi on preparing for career options	Fonterra
	• Rangatahi participating in DOC trapping	DOC

Snapshot: Marae-based whanau education initiative

In 2016 the Ngati Tahu-Ngati Whaoa Runanga Trust secured a contract with the Ministry of Education to *'partner with whanau to raise education participation and achievement'* amongst tamariki and rangatahi. The project team (all iwi members of Ngati Tahu-Ngati Whaoa) attended training sessions provided to ensure they were skilled and able to meet the requirements of the programme.

The team worked with all schools in Reporoa who have learners in Years 1-8: Mihi School, Broadlands School, Reporoa Primary and Reporoa College. The *'Ngati Tahu-Ngati Whaoa Kids Club'* was formed. The aim of this club is to:

- Develop a positive sense of Maori identity
- Build confidence, resilience and a love of learning
- Use a place-based learning approach to strengthen the connection to our place and ensure learning is meaningful
- Develop skills, knowledge and understandings needed to participate effectively in both Te Ao Pakeha and Te Ao Maori, and to develop awareness of important local and global issues
- Provide specific learning support to progress the literacy learning of each child.

Kaupapa for the tamariki included mahi toi (arts and literature), mahi a tinana (physical and oral activities), learning about the marae, and kaupapa focused on Matariki and on awa and roto (waterways). Tamariki were engaged using a range of learning techniques. Holiday noho where held at each of our marae and visits to significant sites were also integrated into the programme.

Ngati Tahu-Ngati Whaoa Kids Club Junior group

The programme also extended to high school students. There is only one secondary school in Reporoa - Reporoa College.

In liaison with the Principal and Deputy Principals, our team held weekly sessions with students during the school day. The focus for this group was providing support to enable them to achieve NCEA credits. Holiday noho were also held at our marae for these students.

The Senior Group (Years 11-13)
The Ministry of Education contract has been successfully retained for multiple years, delivering to tamariki and rangatahi in the rohe. Some of the highlights over the last few years include the junior team publishing a book "Ko Ohaki Te Marae", and the senior group engaged in our programme achieving an overall 95% NCEA pass rate. Many of these students continued in their high school education; some have been on our programme since its inception and we have enjoyed seeing them graduate as year 13 students.

NGA MARAE ME NGA WAHI HIRANGA – MARAE, SIGNIFICANT SITES AND WAHI TAPU

Opportunities: How to preserve and restore the resource

It is essential that knowledge of history and identity is kept alive as part of continuing cultural existence. Opportunities lie in resurfacing and sharing the knowledge of significant sites and history, ensuring iwi members can access these sites and making time and space to learn the korero about them.

Marae provide one opportunity to maintain tribal traditions, as they form central meeting places that are vital to iwi identity. By creating a range of opportunities for people to gather and interact, marae can be the centre of iwi activity as well as a key place to learn and experience reo and tikanga, and pass on history and matauranga (traditional knowledge). Marae can also reflect kaitiakitanga principles by demonstrating sustainable environmental practices. Keeping the marae alive with a sustainable local population of whanau relies on employment opportunities (for example in forestry, farming, tourism, conservation work or through geothermal industries) and planning provisions that allow for homes to be built.

The iwi can work with land managers (forestry/ DOC/ farmers) so they know that they have significant sites on the land under their management, and understand how the iwi would like those sites to be looked after. The iwi can also work with land owners and managers to secure access to these sites and to the cultural materials, kai and other traditional resources found there.

The iwi can work with Councils and resource users to ensure consent processes recognise and ensure sites of significance are not impacted through RMA processes. Further additions to the significant sites/ wahi tapu register by the Runanga will assist resource users and Councils in knowing when there is a site they need to protect.

The iwi could seek opportunities at Orakei Korako for iwi members to reconnect with the significant history there, and possibly restore traditional activity for the iwi such as bathing. The potential to lower the river level again to uncover geothermal features could also be investigated.

Restoring original names to places is another opportunity to revive traditional knowledge and to enrich people's experience of the landscape by being able to view it through a cultural lens.

Progress: What has happened since the last plan review

- The following are highlights in progress to date for Nga marae me nga wahi hiranga – Marae, significant sites and wahi tapu:
- Pare Kore (Zero Waste) workshops held on marae (these identified some difficulties with current services/transfer stations)
- Development of wahi tapu register completed and GIS mapping programme developed; collation of information underway
- Kohatu and iPou (posts with information accessed via a phone app) at significant sites are making information available about the iwi history and relationship with these places (funded by WRA)
- Two tuna workshops have been held on marae to share information on mahinga kai work underway and provide an opportunity for rangatahi and tamariki to connect with and understand these kai species
- A tamariki/ rangatahi marae-based education programme has been run in conjunction with the Ministry of Education since 2016 (see above under Engaging rangatahi). The kaupapa of this programme is to educate our tamariki/ rangatahi with a te ao Maori view while increasing their educational aspirations and achievement
- The Runanga is working with Landcorp and forestry companies to protect sites on farming and forestry land (see above under Positive relationships and also the Mahi ngahere section)
- Marae facilities are in use by Landcorp for company hui and training (see above under Positive relationships)
- The official name of Maunga Kakaramea has been recognised through a NZ Geographic Board application by the Runanga.

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Wananga held on marae to learn Te Reo, tikanga • Practical workshops at marae (e.g. tuna workshops) • Kohanga reo on one marae • Wahi tapu register established and information being added about significant sites and wahi tapu • Work underway with DOC, Landcorp and forestry companies on identification, protocols and management of wahi tapu and significant sites, including annual work planning with DOC under the existing MOU • Signage, kohatu and iPou (posts with information accessed via a phone app) established in some sites conveying information about iwi history and relationships with the area (see Snapshot below). This helps to create a 'reconnection trail' for the iwi, with history retained and a guide for whanau who come home to go to different sites, experience them and learn about them • Marae-based education programme for rangatahi (see snapshot on Engaging rangatahi above) • Workshops, document signings, hui, wananga being held at local marae • Funding from DOC secured to enhance Te Tihi o Ruru (the peak of Maunga Kakaramea) with partners DOC and Timberlands	• Further work on cultural history research; identifying wahi tapu and significant sites; capture more iwi stories, to share and educate; mark and manage these sites* o Establish kohatu and iPou at more locations to share information on significant sites o Investigate a river trail for the public, or work with the existing river trail projects, to provide more signage about the history of sites* o Pou whenua project to mark sites where marae once stood o Research and share iwi history relating to the Rangitaiki catchment and sites in that part of the rohe • Waka paddle for the iwi on Te Awa o Waikato to share korero; waka owned by iwi in use by iwi* • Further work with councils, DOC, NZ Geographic Board and roading authorities to reinstate original names for places and use on maunga, reserves, roads and bridges, parks, etc • Further work with DOC on managing significant sites, reinstating and sharing history of sites, and on a cultural materials plan • Further work with local farm and forest managers to fence off wahi tapu and where appropriate mark sites e.g. by planting another species • Where sites are landlocked, work with landowners to provide access • Progress the recognition/ restoration of island pa in the Waikato River • Upgrade marae facilities, including possibility of further use of geothermal resource for heating, small-scale industry or other uses • Broadband/ wifi hubs at marae (requires further dialogue as some iwi members have concerns about wifi/ electromagnetic frequencies) • Further educational use of marae as homework clubs/ hubs, more kohanga reo/ workshop opportunities • Conduct further wananga to revive historical knowledge e.g. learning moteatea, karanga, mahi toi/ kowhaiwhai/ whakairo, tikanga, kawa, reo • Hold more fun and engaging whanau and youth events at marae, including activities focused on the natural taonga of the area

*

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Reserve Management Plans developed for Wai-o-Tapu and Ruatihi o Paeroa Scenic Reserves	• Advocate for papakainga development options on Maori land • Establish Para Kore (Zero Waste), recycling/ compost systems, mara kai and use of eco-friendly cleaning products at all marae • Further planting of local plants on marae grounds, including rongoa and bird-friendly plants as part of connecting with other forested areas and developing corridors from areas like the Paeroa ranges Investigate further opportunities for restoration of geothermal features at Ohaki and Orakei Korako, and traditional uses such as bathing (see Ngawha section)

* Identified as an iwi priority project in the Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa

Snapshot: iPou and kohatu featuring Ngati Tahu – Ngati Whaoa Cultural History

This project is designed to assist our iwi to create a cultural journey along the Waikato River and the Waiotapu stream, enabling us to identify significant areas and retell our history. We are installing kohatu (carved stones) sourced from within our rohe and iPou (posts with information accessed via a phone app) to frame our rich korero of the past. In doing so we are reconnecting our people to their history, whenua and Te Awa o Waikato. This project is partly funded by the Waikato River Authority.

NGAWHA - GEOTHERMAL

Opportunities: How to preserve and restore the resource

Mapping the features that exist in the rohe and also the traditional uses in different sites would provide a sound knowledge base from which to plan for use, protection and restoration activities.

Opportunities could be identified to better maintain existing sites for iwi uses such as bathing and cooking, and to plan further development that is sensitive to the natural values of the ngawha and the unique geothermal vegetation of these sites. Strategies for enhancement include fences for safety, shelters, cold water tanks for bathing, and putting in more steam boxes for cooking.

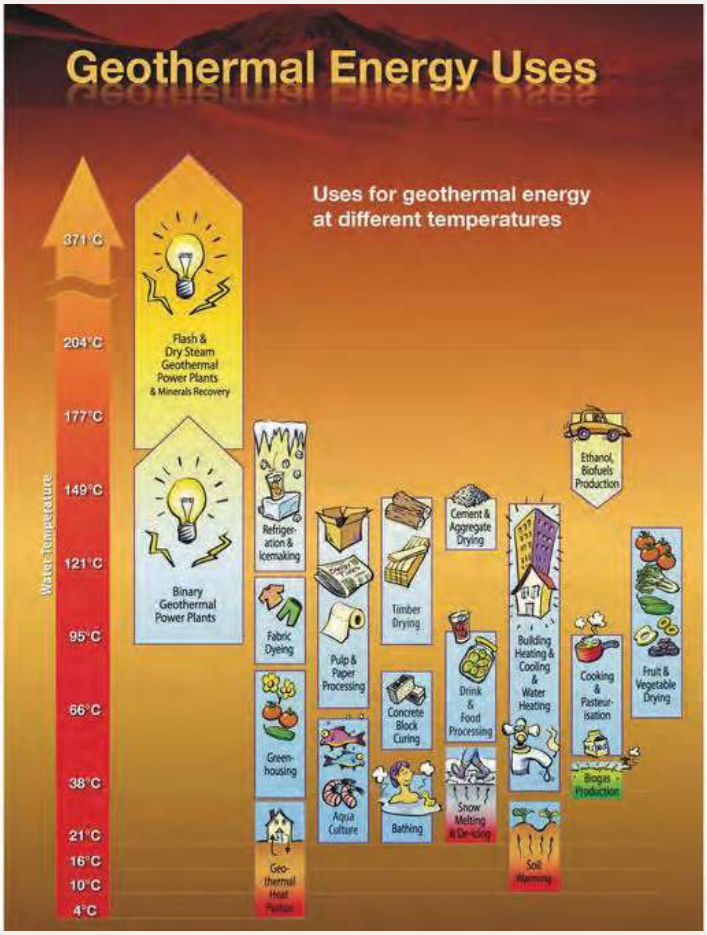
Features that attract tourists or public use can be protected from impacts by building boardwalks, barriers and signage.

The effects of land use on geothermal features can also be addressed. For example, at Waikite DOC has restored the large geothermal wetland and addressed land drainage. Similar work could be done by working with landowners surrounding Reporoa springs that are affected by drainage. Where stock can access geothermal areas, fencing would be beneficial. Plant and animal pest management (including wilding pine control) is also identified as a priority to protect the unique plants in geothermally-influenced habitat (see Koiora section).

The iwi now has the opportunity to be involved in peer review panel processes that monitor consented activity for existing geothermal stations, to ensure cultural and environmental values relevant to iwi are protected. At Ohaki, the consent also requires the investigation of options to improve the clarity of the bathing pool at Ohaki Marae. At Rotokawa, there is a requirement that cultural indicators be developed as part of the peer review process.

Alternative uses of the geothermal resource are many (see picture) and there is an opportunity to research these and find out what is feasible. Some possibilities to investigate include heating buildings or hot water, and utilising heat for greenhouses or other thermal uses. Where no wells exist, and due to the expense in drilling wells, other uses may be coupled with electricity generation to generate a rapid return. A constant flow of fluid is needed to avoid damage to infrastructure, so one option is to generate electricity at peak times while using the fluid for other purposes that may generate more employment at other times. An example exists at Mokai of multiple uses from a development generating employment for the iwi there.

Geothermal energy uses at different temperatures (picture courtesy of GNS Science).



There is an existing well owned by the Crown at Reporoa. Waikato Regional Plan rules for this system, classified for research, limit takes for non-research needs to 2000 tonnes per day. This is not sufficient for electricity generation, but could provide heating for local homes or small-scale industrial use (for example the Waiotapu Arataki Honey operation has consent to use 98 tonnes per day). Use potential is dependent on the discharge capacity from the well, which would need to be researched. The iwi could have further discussions with the Crown and regional council to investigate opportunities for low-impact heat uses to benefit iwi members.

The government (Ministry for Business Innovation and Employment) has funded researchers to engage with iwi and regional councils and answer the question "How can we better understand and model multiple geothermal systems, the interactions between them and their sustainability through the use of geophysical, geochemical and numerical modelling tools?" This has produced a set of 'geothermal supermodels' that can run scenarios for sensitivity testing. This can enable a more collaborative and integrated approach, and less costly ways of understanding and developing the potential for use of the geothermal resource.

A new venture is extracting silica from the geothermal fluid at Ohaki, providing opportunities for local employment and revenue for marae restoration projects. Other possible values may arise in the future, such as further mineral extraction from geothermal fluid (e.g. lithium) and use of thermophilic microbes that live in heated water.

Progress: What has happened since the last plan review

- The following are highlights in progress to date for Ngawha – Geothermal resources:
- Information and resources being shared via the website (Te Taiao section) of Ngati Tahu-Ngati Whaoa Runanga Trust
- The iwi has continued to advocate through resource consent processes for sustainable development of geothermal areas, and the Runanga is involved in geothermal peer review panels with independent experts reviewing geothermal developments at Ngatamariki, Rotokawa and Ohaki
- Red Hills/ Orakei Korako Wilding Pine operation for the conservation and protection of geothermal vegetation has been completed, with the intent to re-visit in 2020 for follow up work
- Extensive pine control has been undertaken across 50 hectares of iwi land at Wai-o-Tapu Scenic Reserve
- Removal of exotic and wilding pines around Whangioterangi/ Echo Lake has been undertaken, and follow up weed control is ongoing (see Snapshot below)
- Traditional ngawha uses - cooking, bathing, healing, dying have been identified as a cultural priority in the Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa
- The '1000 Springs' project is identifying the characteristics of geothermal surface features of the area (including chemistry, energy, colour and biology).

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Iwi involved in several tourism ventures on iwi owned land – e.g. Orakei Korako (Tutukau Z East), Waiotapu (Landowners: Ngati Tahu-Ngati Whaoa; lessee: Te Arawa Group Holdings) • Iwi involved in electricity generation – Ohaki (Landowner: Ngati Tahu Tribal Trust), Rotokawa, Nga Awa Purua and Ngatamariki (joint ventures including Tauhara North No2 Trust); landowning Trusts are engaged in joint venture developments with system management plans, distributing benefits through programmes for iwi beneficiaries and seeking sustainable use • DOC work in the geothermal wetland at Waikite to restore natural drainage patterns, fence and plant; a land exchange has occurred with Landcorp to better protect geothermal features • Conservation and protection work is occurring at Wai-o-Tapu and Orakei Korako - continuing to work towards restoration and enhancement of geothermal vegetation • Wilding pine removal on iwi land at Orakei Korako and Wai-o-Tapu • Iwi is advocating for continued weed control and wilding pine control on DOC land including Maunga Kakaramea, Waikite, Waiotapu, Te Kopia, Rotokawa, Ngatamariki and other key sites • A weed management plan for Waiotapu is being implemented in conjunction with Timberlands and DOC with the support of Waikato River Authority* • Liaison undertaken with researchers in geothermal areas to see where iwi can be involved and benefit from geothermal knowledge o GNS project in conjunction with Runanga is mapping features at Waiotapu and combining with matauranga Maori via website o 1000 Springs project (GNS and University of Waikato) • Geothermal areas in Waikato Region currently categorised and managed for protection, research, development or limited development; significant geothermal vegetation identified and geothermal features in development fields legally protected	• Map all surface geothermal features; identify locations and uses, and plan for further use/ protection – develop and implement management plans for all key sites; continue to assert and uphold customary ownership and interests in geothermal taonga • Further restoration or enhancement projects for geothermal vegetation/ habitat and features o Continue to seek funding and support for projects to enhance and protect geothermal habitats o Implement the Ngatamariki restoration plan in conjunction with DOC, Wairakei Estate and others; carry out weed control, planting and walkway development* • Share matauranga/ knowledge and reinvigorate traditional uses – hold interactive wananga to inform iwi members about the geothermal taonga of the rohe, and involve iwi/ rangatahi in restoration projects and activity to engage with the resource* o Field trips o Traditional uses - cooking, bathing, healing, dying, etc o Restoration projects • Research and restore or develop cultural, domestic and economic use opportunities: bathing, cooking, thermal use/ heat exchange for marae/ homes, parallel or cascading use from developments, industrial/ chemical extraction uses and tourism o Continue exploring how to restore bath at Ohaki o Research uses at Mokai to see how they might apply o Investigate new technologies and uses

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Iwi are actively involved in resource consent processes for geothermal takes to ensure cultural values are protected and geothermal resources are sustainably managed • Information sharing and input - Runanga is involved in annual discussions and peer review panel process for Ngatamariki, Rotokawa and Ohaki to monitor the current operating of geothermal stations at these sites through the resource consent process	o Work to streamline consenting for low-level iwi use • Continue to work with Regional Council and others to develop a better understanding of the impacts of development and acknowledgement by developers, with restoration where feasible or appropriate mitigation • Continue to encourage knowledge gathering and understanding to inform this policy to ensure areas are protected and managed sustainably in the future

* Identified as an iwi priority project in the Waikato and Waipa River Restoration Strategy: *Te Rautaki Tamata i Nga Awa o Waikato me Waipa*

Snapshot: Whangioterangi/ Echo Lake

Wilding pines are a threat to the habitat of rare geothermal plants and features. An extensive integrated weed management approach is being taken across Wai-o-Tapu South and parts of Wai-o-Tapu North Geothermal areas. This area is of cultural significance to the Ngati Tahu-Ngati Whaoa people who are one of the major landowners this project. The aims are to continue the restoration and enhancement of this site by addressing the extensive weed threats to geothermal, aquatic and wetland areas.

The project will undertake sustained weed control across approximately 423 ha from 2019 to 2023, co-ordinating across land owners and land managers. This work will build on previous weed control efforts, and contribute to the ongoing enhancement of one of the most significant remaining geothermal areas in the Upper Waikato.

The focus area is bounded by land managed as a working forest by Timberlands. The majority of the forestry area around Whangioterangi/ Echo Lake has been harvested, but there are trees remaining on the cliff edge above the lake which were not able to be included in the harvest. The work on these trees will be undertaken in a staged approach as there are some difficulties with how the pines will be controlled. Stage one encompasses only the trees on the bank/ cliff edge which can be accessed by fixed length rope. Other trees down the bank will be further assessed to determine appropriate control techniques as part of future stages of the project. The project is co-funded by Waikato River Authority.

O te manu e kai te miro, nona te Ngahere:
Ko te manu e kai te matauranga, nona te ao

The bird that partakes of the Miro berry, reigns in the forest.

The bird that partakes of education reigns in the world.

WAI – LAKES, RIVERS, STREAMS, WETLANDS AND AQUATIC LIFE

Opportunities: How to preserve and restore the resource

There are ongoing conversations nationally about Maori rights and interests in water, as part of setting national direction for freshwater management. The iwi has an ongoing opportunity to be involved in this dialogue, so that cultural values and priorities are included.

The Rangitaiki River Forum is a statutory co-governance mechanism established in 2012 via the Treaty Settlement process for Ngati Whare and Ngati Manawa, as a way for iwi and regional and district councils work together to protect and enhance the mauri of the Rangitaiki River and its tributaries. In 2015, the Forum published the document *Te Ara Whanui o Rangitaiki - Pathways of the Rangitaiki River,* to set strategic direction for the Rangitaiki and ensure a healthy river for the benefit of present and future generations. Bay of Plenty Regional Council/ Toi Moana provides administrative and technical support to the Rangitaiki River Forum, and gives effect to *Te Ara Whanui o Rangitaiki* through its Regional Policy Statement. A Tuna Forum has been established for the Rangitaiki and in 2016 a plan was prepared for tuna enhancement *(Te Hekenga Nui o te Tuna)*. Work is also underway to implement the National Policy Statement for Freshwater Management through limit-setting in the Rangitaiki (Plan Change 12). Bay of Plenty Regional Council (BOPRC) is working with a multi-stakeholder group which includes some iwi members along with a Central North Island Iwi Holdings Ltd representative. This group will help to:

- Identify local community values for freshwater
- Set local limits for water quality and quantity
- Develop solutions for managing water in the catchment.

Ngati Tahu-Ngati Whaoa have not been represented on these groups to date, but the Runanga is in discussion with BOPRC to explore how the iwi can be included in future governance and planning processes regarding the Rangitaiki catchment.

BOPRC has developed its Region-wide Water Quantity Plan Change (Plan Change 9) as the first step in a two-stage approach to improving water management in the Bay of Plenty. This first step has focused on water quantity. There is an opportunity for the iwi to be involved in the second step in this approach (Plan Change 12), which will address water quality.

In the Waikato catchment, Treaty settlement legislation has given legal standing to Te Ture Whaimana o Te Awa o Waikato/ The Vision and Strategy for the Waikato River. Councils and central government are required to work with river iwi and communities to protect and restore the health and well-being of the river, and the iwi has a key role in monitoring progress towards this. The Vision and Strategy state (among other things) that the Waikato River should not be expected to absorb any further degradation, and that the water quality of the river should be safe for people to swim in and take food from over its entire length. The settlement has also provided financial resources for achieving

the Vision and Strategy. This enables greater involvement of the iwi in both governance and action to restore the river.

Waikato Regional Council Plan Change 1 (Healthy Rivers Wai Ora) proposes to require farmers throughout the Waikato and Waipa catchments to take actions such as stock exclusion from waterways, reducing contaminant losses and preparing farm environment plans. The iwi has an ongoing opportunity to continue its role in advocating for effective policy as the Plan Change proceeds through its process.

Iwi involvement in resource consent processes regarding water provides the opportunity for cultural values to be built in to the approach at the early stages of development. The iwi can advocate for water quality and aquatic habitat improvements to mitigate the effects of water take and discharge permits. Consideration of how infrastructure and development of both the Waikato and Rangitaiki river margins impacts on the natural beauty and essence of both awa should be considered and discussed with the Runanga as part of consent and development processes.

There is also an opportunity to access river clean-up funding and work with iwi land Trusts and other local farmers to achieve waterway fencing and riparian margin restoration. Keeping stock well back from waterways, including small headwater tributaries, is a cost-effective first step to improving water quality. Because the soils of the rohe are formed from hard geology rather than soft muddy rock, local waterways have the potential for high water clarity if animals are excluded. Stock exclusion will stop manure from going directly into the water and prevent gully formation and disturbance of the banks and beds. Planting retired areas helps restore habitat for water life; using native species with traditional cultural uses also makes these plants available again to the iwi. Fencing off all remaining repo (wetlands) will allow them to remain un-compacted to enhance their cleansing and filtering functions. If an iwi member wished to establish a nursery, trees could be supplied as a way to achieve canopy closure and minimise weed issues in fenced areas. For the hydro-lakes, further realignment of fences back onto the true boundaries would allow the riparian margins to be extended, as has occurred at the natural lakes Ngahewa, Ngapouri and Tutaeinanga. Ongoing pest control for these areas (e.g. along the fence-lines) would be beneficial. A wide riparian buffer can trap and filter overland run-off and this will reduce some contaminants from reaching waterways (such as sediment, phosphorus and faecal matter). It is more difficult to reduce nitrogen loss from pasture, but there are opportunities to publicise the knowledge gained from best practice nutrient management trials conducted in Reporoa.

Wetlands and riparian areas are among the sites identified as opportunities for restoration in restoration management plans compiled for three blocks of iwi landholdings. Restoration projects at these sites could be further progressed with partner organisations. The consents for Ohaki geothermal station require 19.8 ha of wetlands to be recreated. The iwi could also approach forestry management companies to look at protection of wetlands in the forest blocks they manage that have been identified as Significant Natural Areas. Another project could be to revive traditional knowledge of wetland rongoa species and the use of paru from wetlands as a dye for weaving materials.

There is an opportunity through current projects to further survey fish distribution in the Waikato and Rangitaiki catchments, and to share knowledge about traditional kai and explore how to revitalise these species (including through restoring existing mahinga kai sites and through innovative aquaculture/ 'kai bowl' projects). The Rangitaiki tuna enhancement project (Te Hekenga Nui o te Tuna) involves an information-gathering stage, to be followed by assessing feasibility of fish passage options, developing a cultural health index and kaitiakitanga protocol, increasing community awareness, and reassessing tuna fisheries management. Options to provide safe downstream passage for sexually mature tuna could include:

- ceasing power generation during migration events and actively spilling water down a safe spillway
- deterrents and protective measures at intakes along with safe permanent by-passes
- trap and transfer downstream.

Monitoring waterways provides an opportunity for iwi involvement, either by using information collected by consent holders like Mercury and Contact Energy, by reviewing data from regional environmental monitoring sites, or by the iwi collecting information about culturally relevant indicators such as the tuna and mahinga kai workshops held recently. TARIT and affiliated iwi also have a project in development called River Sense. River Sense will be a network of remote sensors for continuously monitoring some aspects of water quality within the Upper Waikato catchment. This data will be provided online so that iwi and other interested parties may have real-time information available to identify environmental and conservation concerns and opportunities.

In late 2012 TARIT, in conjunction with Ngati Tuwharetoa and Raukawa, developed draft fisheries regulations that will be administered by the Ministry for Primary Industries (MPI). These were accepted as legislation in July 2017, with the intent to enable participating iwi to actively manage customary fishing in the Upper Waikato catchment as one fisheries area. These regulations only cover species included in the Fisheries Act (such as tuna, koura, shellfish and adult whitebait, freshwater goldfish and catfish) and do not cover those managed under the Conservation Act (trout, juvenile whitebait and unwanted species such as koi carp). TARIT, in consultation with the affiliates, are currently working with MPI and the other iwi partners on how these regulations will be implemented. Once in place, opportunities for the iwi from this piece of work may include taking kai found in the Upper Waikato catchment (noting that for some lakes, Te Arawa Lakes Trust fishery regulations apply). The regulations will provide for iwi customary use, including taking fish for hui and marae events such as tangihanga, and keeping live fisheries in pataka and pa tuna to provide for mahinga kai needs, where a permit is given by a 'customary authoriser' appointed by the iwi Trust. The iwi can also suggest by-laws that, if approved, will apply to all users of the fisheries.

The Waikato Regional Council released a management plan for shallow lakes of the region in 2014. This included Ngahewa and Tutaeinanga (Ngapouri and Ngakoro being too deep to be classified as shallow lakes). The management plan recommends a combination of opportunities for lake restoration, including reduced nutrient and sediment loads from catchments and from lake beds, fencing and planting lake margins, managing exotic species in lakes and exploring the re-establishment of native plant communities where they have collapsed. Collaborative enhancement projects in the rohe are underway for Ngahewa, Ngapouri and Tutaeinanga, with the formation of the '3 Lakes Group' which works together to champion projects and research. The group has completed joint funding bids and meets 1-2 times a year to discuss opportunities and make progress. The wetland at Ngahewa has easy public access and is close to Maungakakaramea, so it is a good site to showcase a healthy wetland.

Opportunities to restore mahinga kai: What we can change – an excerpt from Mahinga Kai: Ngati Tahu-Ngati Whaoa Story

- There are opportunities to take action, and influence others to act, on a range of factors that can enhance mahinga kai:
- Landowners can improve riparian management by excluding stock and planting to provide more shade, bank stability and habitat for stream species
- Councils, landowners and transport authorities can check that there are no additional barriers to fish and tuna movement into upstream habitat (e.g. ensuring culverts are embedded in the stream and not overhanging or impassable)
- Wetland habitat can be protected from drainage, and new wetlands recreated and planted to enhance habitat and water quality
- Forest areas can be protected, enhanced and extended to provide suitable upstream habitats, cool the water and prevent erosion and sedimentation of waterways
- A range of other actions can contribute to improving water quality and achieving the Vision and Strategy for the Waikato River – Te Ture Whaimana o te Awa o Waikato
- A sustainable stocking rate for tuna in the upper catchment can be investigated, so that tuna can grow to a good adult size
- Targeted habitat restoration can be undertaken for tuna and koura, and their health and numbers monitored
- Further work is needed on how to restore the downstream migration path for adult tuna from the upper river down to the sea, so tuna can complete their breeding cycle
- Aquaculture options for kai species can be investigated and trialled
- Collaborative projects can be undertaken with researchers, agencies, stakeholders and the local community.

Progress: What has happened since the last plan review

The following are highlights in progress to date for Wai - Lakes, rivers, streams, wetlands and aquatic life:

- Reduction in arsenic and mercury in the Waikato River: discharge reductions through the resource consenting process at Wairakei (no further discharge of geothermal fluid occurring other than steam condensate) and Ohaki (shallow groundwater monitoring to ensure reinjected fluid will not affect the river)
- Fencing and planting over 4 hectares of setback areas at three lakes: Ngahewa, Ngapouri and Tutaeinanga (see Snapshot below)
- Restoration of geothermal areas and pest control at Lake Rotokawa (see Snapshot below)

- Planting over 4 hectares at Ohaki wetland and adjacent Hardcastles wetlands (see Snapshots below) - approximately 25000 plants will be planted by the end of 2019; pest control is ongoing at the wetland in conjunction with Fish and Game
- Understanding what impacts on freshwater condition and kai species:
    - Nga Tohu o te Taiao (cultural freshwater indicators project) stages 1 & 2 completed, with development of a 'logic wheel', and the Wai Ora Wai Maori Assessment Tool to assess site condition through a matauranga lens (converted to a phone app)
    - Publication of mahinga kai report and booklet *Mahinga kai: Ngati Tahu-Ngati Whaoa story*, collating a range of matauranga and technical knowledge about freshwater kai species (see box below)
    - Development of a Ngati Tahu-Ngati Whaoa methodology (combining matauranga and science) for undertaking mahinga kai surveys in conjunction with use of the Wai Ora Wai Maori phone app; surveys undertaken at 18 sites to establish the current state of mahinga kai in the rohe tributaries (see Part II for results)
- Iwi farm blocks excluding stock and planting waterways: mahi underway with both Tutukau Z East and Paeroa South B1B2
- Iwi priority projects for restoration identified as part of the *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa* (see box below)

Iwi participation in the Healthy Rivers: Wai Ora process (Waikato Regional Plan Change 1); industry preparing to implement changes e.g. Sustainable Milk Plans - dairy industry created nutrient management plans for all (700+) dairy units in the Upper Waikato, which can form a start to their Farm Environment Plans; Tomorrow's Farms Today (25 farms in Reporoa) and Dairy Push peer sharing and research projects identifying ways to increase farm profitability while decreasing nutrient loss.

Mahinga kai – an iwi journey of research and restoration

One of the key recent areas of focus for the Environment Department of the Ngati Tahu-Ngati Whaoa Runanga Trust has been in relation to mahinga kai. In this context, mahinga kai describes fish and plants associated with Te Awa o Waikato that were historically, or are currently, harvested for iwi use. The term mahinga kai includes the kai source itself, along with methods of harvest and processing. In 2015 we undertook an extensive review of historic and contemporary information in relation to several key fish species in our rohe. We gathered Ngati Tahu-Ngati Whaoa matauranga as well as European information and western science to create a more holistic picture of the history and current condition of kai species in the rohe We sought to chart a way forward and focus on where we can achieve the best outcomes for our people in relation to mahinga kai. Components of this extensive report were modified and condensed to share in the booklet *Mahinga kai: Ngati Tahu-Ngati Whaoa story.*

We have also been working with the project Nga Tohu o Te Taiao over the last two years. The project was a four-year multi-party collaboration led by the University of Waikato in partnership with Waikato-Tainui College for Research and Development, Universities (Waikato, Massey), Crown Research Institutes (Landcare Research, NIWA), Waikato Regional Council and Ngati Tahu-Ngati Whaoa Runanga Trust. The aim of the Nga Tohu o Te Taiao project was to develop knowledge, tools and processes for setting freshwater limits for mahinga kai within the National Objectives Framework. It aimed to explore the extent to which mahinga kai represents a key proxy for the state of, and pressures on, freshwater catchments and how synergising matauranga Maori and contemporary science can enhance credibility and acceptability of limit-setting to sustain mahinga kai objectives. The project synthesised Ngati Tahu-Ngati Whaoa matauranga and developed a 'logic wheel' and the Wai Ora Wai Maori tool to enable mahinga kai site assessment through a matauranga lens. This tool was then converted to a phone app, which, in turn was used as a foundation to build a specific Ngati Tahu-Ngati Whaoa framework and methodology to assess the health of our mahinga kai sites using both matauranga and science methods.

The future aspiration is to have a safe, consistent kai source available for the iwi. A first step could be to develop a number of education-focused 'kai bowl' showcase sites on tributaries to the Waikato River. Revitalising mahinga kai is aligned to the overall Vision and Strategy for restoring and protecting the well-being of the Waikato River. The initial focus on restoring tributaries as 'kai bowl' sites will contribute to this overarching direction

Mahiga kai - an iwi journey of resarch and restoration

Our Vision for mahinga kai:

To be able to provide healthy and plentiful mahinga kai for the Ngati Tahu - Ngati Whaoa people, visitors and for cultural events, tangi and other important occasions. Ngati Tahu - Ngati Whaoa consider this as part of our heritage and pride of the iwi. The ability of our waterways to sustain and provide for Ngati Tahu - Ngati Whaoa people is integral to the iwi's wellbeing.

Mahinga Kai Report bringing together Matauranga and science about kai in our Rohe

Nga Tohu o te Taiao project looking at cultural indicators of freshwater health

Mahinga Kai Booklet
Mahinga kai: Ngati Tahu - Ngati Whaoa story

Key species:
kokopu, tuna, koura, kakahi, watercress

Direction:

- *Tributaries need to be restored*
- *Look at aquaculture opportunities to create 'kai bowls'*
- *safe consistant kai sources for the future*

Need more information on fish distribution

Survey at 18 sites using Ngati Tahu-Ngtai Whaoa and science methods

Continue habitat / Riparian restoration word

Scoping 'kai Bowls' opporunities (WRA funded project)

Look at where to next for 'kai bowls' and site restoration

Link with NIWA MB&E Funded work on keystone cultural species

Koura restoration plan

Iwi priorities in Waikato and Waipa River Restoration Stratergy

Iwi priority projects for restoration of the Waikato and Waipa Rivers

The *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa* has been prepared by the Waikato Regional Council, Waikato River Authority and DairyNZ to progress and focus efforts to achieve the Vision and Strategy for the rivers. While the aim is to restore and protect the rivers, the strategy takes a whole-of-catchment approach, and includes cultural priorities.

As part of the strategy development process, Ngati Tahu-Ngati Whaoa put forward a number of project proposals, all of which were included in the 'iwi priorities' stream of this restoration strategy. Other priorities for the rohe appear in the Upper Waikato section of the strategy (including recreation, geothermal and biodiversity-focused projects).

Inclusion in the strategy does not imply the project will be funded, but recognises it as a valuable piece of work that would contribute to the overall restoration and protection of the Waikato and Waipa Rivers.

These projects identified by Ngati Tahu-Ngati Whaoa are all rated Very High Priority in the iwi priorities section of the strategy. The entire list is included here, but specific strategies also appear in the relevant sections of this document (Ngawha, Koiora, Whenua etc).

Project title	Summary of activity	Site location
Investigation and construction of tuna/ koura ponds (kai bowl) for cultural harvest	• Investigation of mahinga kai farming • Identification of sites • Construction of ponds (6)	Waikato River catchment within Ngati Tahu-Ngati Whaoa area
Rehabilitation/ restoration of key mahinga kai sites	• Collate information on historic mahinga kai sites • Assess state of identified sites • Distribute information and wananga • Implementation of enhancement measures	Mangahoanga, Mangakara, Kawaunui, Orakonui, Mangatoetoe, Pueto, Torepatutahi, Mangamingi and the mouths of all inflowing streams into Te Awa o Waikato
Geothermal matauranga	• Wananga and capture matauranga • Implementation of enhancement measures • Comparison with western science knowledge • Distribute information and wananga	Orakei Korako, Waihunuhunu, Red Hills, Waiotapu, Maunga Kakaramea, Waikite, Mangaongaonga, Rotokawa, Ohaki, Whangairorohea, Ngatamariki, Golden Springs, Waimahana, Te Kopia, Atiamuri
Wetlands – Ngati Tahu-Ngati Whaoa matauranga – rongoa and weaving	• Wananga and capture wetland matauranga • Assessment of identified wetland sites • Implementation of enhancement areas • Distribute information and wananga	Red Hills, Torepatutahi, Waikite, Ngahewa, Ohaki, Tutukau Z East, Takapou/Te Toke, Waiotapu, Ruatawiri
Cultural history research and documentation	• Collation of historic marae and pa sites • Work with landowners to acknowledge sites • Establish kohatu or pou • Share information with marae and public	Waikato River catchment within Ngati Tahu-Ngati Whaoa area

Project title	Summary of activity	Site location
Waka paddle, korero sharing and building connection with Te Awa o Waikato	• Includes cultural and water safety training, and provisioning of waka and equipment	Nga Awa Purua to Atiamuri
Ngatamariki Scenic Reserve/ Orakonui catchment rehabilitation/ enhancement	• Control of weeds (6 years) • Establish appropriate signage • Planting and maintenance • Develop walkway to geothermal area	Lower Orakonui Stream Catchment/Ngatamariki Scenic Reserve
Support of Ngati Tahu-Ngati Whaoa land blocks/ trusts to achieve sustainability outcomes	• Develop restoration strategies • Implement restoration activities	Tutukau Z East, Takapou, Ohaki Tribal Trust, Tauhara No 2 Trust, Paeroa South, Tahorakuri 2, whanau trusts, Tauhara Moana and some smaller blocks
Establish planted corridors for all streams from the Paeroa Range within the rohe and Te Awa o Waikato catchments	• Fencing of streams • Work with agencies to achieve vision • Planting of native plants and creating corridors	Paeroa Range and associated tributaries flowing from the range within the NTNW rohe
Ohaki wetland enhancement and restoration	• Wetland planting and maintenance - 15ha • Control of willow within wetland	Ohaki Wetland, Broadlands

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Geothermal station consents resulting in reduction in arsenic and mercury • Iwi participating in discussions nationally over Maori rights and interests in water • Iwi engaging with the Bay of Plenty Regional Council with regard to our interest in the wai of the Rangitaiki catchment • Iwi engaged in Waikato River Vision and Strategy and policy development and implementation • Waikato Regional Council Plan Change 1 requiring stock exclusion, Farm Environment Plans and reduction in contaminant loss • Waikato River Authority implementing restoration strategy and distributing funding for river clean-up projects; iwi accessing funds for projects	• Secure funding and implement all of the iwi's priority restoration projects identified in the *Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa* • Play an active role in management of wai within the Rangitaiki catchment that is part of the iwi rohe through planning, limit-setting and other restoration processes • Explore further opportunities for testing nutrients in water and watercress and researching other kai species • Advocate for policy to reduce conversion of forests to pasture, without creating undue economic penalties on the iwi as forest lands are returned • More projects to plant and restore riparian areas by waterways

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Restoration projects being undertaken o Iwi farms and other farmers fencing waterways and some wetlands o Riparian planting of streams and wetlands – Mangatoetoe, Te Toke, Nga Awa Purua; Hardcastle lagoon and Ohaki wetland enhancement projects underway (over 5 hectares planted since 2013) o Scoping report completed for restoration of lower Mangahoanga stream o 3 Lakes Action Plan and fencing and planting projects at lakes Ngahewa, Ngapouri and Tutaeinanga o DOC enhancing vegetation around Ngahewa (willow control; mistletoe protection in place) o DOC work in the geothermal wetland at Waikite to restore natural drainage patterns, fence and plant • Mahinga kai restoration opportunities being investigated, including aquaculture/ kai bowl projects, following publication of Mahinga kai booklet • Fish distribution and mahinga kai condition surveys – using specific methods, informed by science and matauranga of Ngati Tahu-Ngati Whaoa, including the Wai Ora Wai Maori Assessment Tool (phone app) and the mahinga kai stream and habitat assessment framework • Iwi involved with groundwater modelling research for Reporoa basin • River Sense being developed by TARIT and affiliated iwi – creating a network of remote sensors for continuous water quality monitoring in the Upper Waikato catchment and on-line data access • Iwi involved in development of fisheries regulations through TARIT	• Complete restoration of lower Mangahoanga stream • Work with iwi land Trusts, other farmers, DOC, and regional councils to find opportunities for enhancing existing wetlands – stock exclusion, planting with traditional species, plant and animal pest control • Work with iwi land Trusts and other farmers to find opportunities to reinstate or extend wetland areas • Investigate opportunities for further lake restoration and water quality enhancement (with Te Arawa Lakes Trust, DOC and other partners) • Work with Mercury to look at what can be done about river level fluctuations and migration barriers • Continue work on mahinga kai • Further fish distribution/ mahinga kai condition surveys; extend and repeat in future • Encourage use of the phone app for mahinga kai through rangatahi programmes run by the iwi/ Trusts • Share knowledge about traditional kai (life cycles and requirements, and gathering and preparing) o Implement more projects to restore key mahinga kai sites, increase kai species/ abundance and reinstate migration e.g. for tuna o Work with NIWA on Cultural Keystone Species project for koura restoration in the rohe o Trial aquaculture/ kai bowl initiatives for cultural harvest and educational showcases • Hold wananga on dying and weaving with traditional wetland resources and harvesting of traditional species • Actively facilitate robust nutrient management/ farm environment planning and implementation for iwi blocks; support this on all pastoral land in the rohe (see Whenua)

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
	• Investigate options for water storage on iwi farm blocks to secure water without stressing ecosystems in dry periods • Explore options under the Fisheries Regulations for iwi to be involved in managing fisheries and cultural harvest • Work with TARIT on investigating options for purchase of an iwi boat to access the river and carry out monitoring • Advocate for appropriate improvements to access points, facilities, speed limits on the river and trails to enhance enjoyment of waterways in the rohe

Past achievements: Watercress testing – a Runanga project in conjunction with TARIT

Following media coverage on the dangers of arsenic levels arising from natural geothermal activity, a project was undertaken to determine if local watercress was fit for human consumption. There were also a number of concerns from kaumatua and locals around the effects of land use on our kai sources, especially with the increase of dairy farming within the rohe. For this reason, it was decided to test watercress for both arsenic and *E. coli* (a microbe that indicates where there may have been contamination by faeces/ manure).

Sites were chosen at Handcock Rd, Otaketake, Te Kopia Rd, Te Toke, Torepatutahi Stream (the Canyon), Sangro Rd, and the Moke Homestead.

Aseptic samples were taken, packaged and stored at Fonterra and then dispatched to Hill Laboratory, Hamilton. The results were then sent to NIWA and a report was delivered to the Runanga at Reporoa College.

Test results from all sites confirmed the watercress was fit for human consumption although results varied. Te Toke was the site of greatest concern, requiring follow-up testing. There was also a request to test watercress at Ohaki – Piripiri Rd.

Past achievements: Tuna project

The Ngati Tahu-Ngati Whaoa Runanga Trust combined forces with Mighty River Power (now Mercury) and NIWA in a partnership to look at enhancing tuna (eel) populations. The project is based on a comprehensive study of the tuna life-cycle, understanding the current status of tuna and identifying the impacts of land use and development on its life-cycle and reproduction. A tuna workshop was held at Ohaki Marae, with a presentation of science information to share knowledge with iwi members. Environmental issues and current hazards affecting tuna were discussed, and options were identified for iwi to assist with monitoring tuna. Restocking methods are being used to help tuna get above the hydro-dams, as the dams form a barrier to the young tuna completing their migration from the sea to the upper river. However, more work is needed to work out how adult tuna can be assisted to migrate downstream to reach the sea to breed.

Snapshot: Lakes Ngapouri, Tutaeinanga and Ngahewa

Collaboration between key agencies (Ngati Tahu-Ngati Whaoa, Eastern Region Fish and Game, Te Arawa Lakes Trust, Waikato Regional Council and the Department of Conservation) has highlighted lakes Ngahewa, Tutaeinanga and Ngapouri as an area for focus and restoration. These lakes are of cultural, natural, historic and recreational importance and are located in the headwaters of the Waiotapu Stream which is a major tributary of the Waikato River in the upper Waikato catchment. The lakes are the only natural freshwater lakes within the upper Waikato catchment and are located amongst the geothermal areas of Maunga Kakaramea, Waiotapu, Mangaongaonga and Waikite, forming part of the mosaic of the landscape and natural diversity of the area. In 2016, the agencies jointly developed the 3 Lakes Action Plan – an interagency plan for the protection, enhancement, and restoration of the three lakes. The aims are to achieve improved water quality, biodiversity, and catchment management, and the ability to share cultural information and reconnection of iwi, the community and landowners to these sites.

Funding was successfully gained in 2016 from the Waikato River Authority for fencing and planting at Lakes Ngapouri and Tutaeinanga, to restore and extend their riparian margins. The purpose of this work is to re-site fences to the correct boundaries, excluding stock and enabling riparian margins/ reserve areas to be restored. This involves approximately 5,103m meters of new fencing and an area of 4 hectares of riparian margin being replanted in native riparian plants around the two lakes. This particular restoration project is being led by Eastern Fish and Game for fencing and restoration work at the lakes, with Ngati Tahu-Ngati Whaoa Runanga Trust managing the overall project. Additional funding has been provided for fencing by Waikato Regional Council and Department of Conservation, and landowners around the two lakes are working alongside us as part of this project.

A network of traps has been established around the margins of Lake Ngapouri to assist in controlling rats, stoats, weasels and ferrets around the reserve. Funding was provided for the traps by Waikato Regional Council, and the trap network was established by the Runanga, with support from local landowners.

Signage and iPou (posts with information accessed via a phone app) have been installed at both Lake Ngahewa and Lake Ngapouri to share environmental, cultural and historical information. This project has funding from the Department of Conservation Community Fund.

Snapshot: Enhancement of Ohaki and Hardcastles wetlands

The Runanga and iwi members have undertaken planting and riparian enhancement on 1 hectare of riparian area at Hardcastles Lagoon on the Waikato River on LINZ land, funded by Waikato Catchment Ecological Enhancement Trust and TARIT. The aim of the work is to increase habitat and riparian protection. The work will increase the extent of plantings along this stretch of the Waikato River, linking to restoration plantings at the adjacent Ohaki Wetland.

Ohaki is a constructed wetland associated with the geothermal station; it is now owned by the Ngati Tahu-Ngati Whaoa Runanga Trust and co-managed with Eastern Fish and Game under a conservation covenant. Some planting of the wetland was undertaken by Fish and Game during the wetland construction in 2010; however large areas of the site remained in grass. Five further hectares have been targeted for planting, beginning with a Runanga project in 2017 and continuing in 2018 and 2019 funded by Waikato River Authority and TARIT. The restoration planting will increase riparian protection and connectivity in a key wetland area and provide increased habitat for bird species and other fauna.

Pest control is also being carried out in the wetlands and river riparian areas to control rats, feral cats, stoats and possums. Traps were established with funding from the Waikato Regional Council (Small Scale Community Initiatives Fund); they were installed and are maintained by Fish and Game.

Ngati Tahu-Ngati Whaoa Runanga Trust has a strong working relationship with Eastern Fish and Game Region. We share similar values in regards to wetland enhancement, protection and creation as well as a desire to improve water quality and the ecological values of the waterways in the Upper Waikato catchment. Our relationship has been enacted through co-management of Ohaki Wetland and working together to achieve enhancement of the wetland and Waikato River margins at this site. Additionally, the lead taken by Fish and Game in the implementation of the restoration project to restore the riparian margins of Lakes Ngapouri and Tutaeinanga has enabled this project to achieve over 4 hectares of additional protection around the lakes and help protect these taonga. These two projects are part of a wider ongoing korero and relationship with Fish and Game which provides support and information to our iwi to help us achieve our goals. The wetland and lakes projects are discussed in more detail in our snapshots.

Snapshot: Lake Rotokawa

Lake Rotokawa and the surrounding area is of particular significance to the iwi as a place where birds were harvested when in season. Rahui posts were placed at the northern side of the lake and at the base of Tauhara mountain by rangatira of Ngati Tahu-Ngati Whaoa, to prevent anyone from going to the area and taking birds. Birds would not be harvested until an inspection of a tuahu at the mouth of the Parariki Stream indicated that the birds were ready for harvest, therefore initiating a subsequent lifting of the tapu.

After being used from the 1930s to the 1980s as a sulphur mine, this land came under the management of the Department of Conservation (DOC). Ngati Tahu-Ngati Whaoa, as the iwi holding sole mana whenua for the area, have provided support for the development of the Conservation Management Plan for the reserve and are participating in its implementation.

Jane Williams, Senior Ranger Biodiversity, says “This plan has given direction to management options taken by DOC and involving Ngati Tahu-Whaoa in the last year. Our working relationship with Ngati Tahu-Ngati Whaoa encompasses an annual meeting to discuss how we can best work together and restore Rotokawa Conservation Area”.

Recent work at Rotokawa where our iwi has worked together with DOC include:

- seed collection of geothermal kanuka to send to the National Indigenous Seed Bank as a response to myrtle rust
- assisting with setting and checking pest traps
- weed control.

KOIORA – TERRESTRIAL FLORA AND FAUNA – (PLANTS AND ANIMALS)

Opportunities: How to preserve and restore the resource

A Memorandum of Understanding (MOU) is now in place between the iwi and DOC. This not only guides the management of areas significant to the iwi, it also allows discussion on an annual basis about DOC's work programmes across the area and how iwi members can be involved in this mahi. These discussions give the opportunity for iwi issues to be raised and discussions to be had such as how the iwi and DOC can work together.

Iwi members would like to see a sanctuary for native birds within the rohe. A pest-free environment is very intensive to create and maintain, so a significant effort would be needed to see the return of birds like kiwi or kokako to the rohe. However, planting along waterways that arise in the forest headwaters could be a first step in helping to bring native birds like tui and kereru back in greater numbers around Ohaki and Matarae marae. Pest and predator control projects in line with the national Predator Free 2050 goal are critical in order to enhance native species.

Plantings at Te Toke are already restoring rongoa species. Other sites are also being planted using rongoa species – e.g. Ohaki, Hardcastles, Mangatoetoe, and there is an opportunity to continue with these species where they are compatible with the area.

Further iwi research could identify plant types and sources for traditional weaving materials so that more plantings could be established for these purposes.

The iwi has had restoration/ management plans prepared to identify opportunities for ecological restoration in three iwi-owned blocks at Ohaki, Paeroa South and Tutukau. The Ohaki block has significant natural areas of geothermal habitat and wetlands near the Waikato River, adjacent to the large wetlands at Hardcastle and Rawhiti Lagoons where replanting projects are underway. These are valuable habitat areas but affected by river level fluctuations. The Tutukau and Paeroa South blocks feature geothermal areas (including Orakei Korako), headwater streams, and riparian and wetland areas. These offer plenty of scope to work with landowning iwi Trusts and neighbouring owners for restoration.

There is an opportunity during consultation about any proposals to develop geothermal resources to take a precautionary approach to preserving rare geothermal habitats. If the heat is lost from the ground, the habitat changes and rare geothermal plants may be overtaken by other species including weeds. Fencing and pest control in geothermal habitat areas can also protect the rare species that are found there. A 2015 report outlines priority geothermal vegetation that would benefit from fencing and pest control (Priorities for pest plant and animal control, and fencing at geothermal sites in the Waikato Region. Waikato Regional Council Technical Report 2015/09). Many of the high priority sites in this report lie within the Ngati Tahu-Ngati Whaoa rohe at Waiotapu, Orakei Korako/ Red Hills, Te Kopia, Waikite, Maungakakaramea, Rotokawa and Golden Springs. Sites recommended for immediate pest plant control are at Waiotapu and Waikite. Other sites where this would be beneficial are at Maungakakaramea, Te Kopia, Ngatamariki, Ohaki, Orakei Korako, and Rotokawa. Animal pest control would also be recommended for these sites. There are fewer sites still requiring stock fencing.

A review of the Taupo District Council's District Plan offers an opportunity to ensure protection of biodiversity in Significant Natural Areas.

Progress: What has happened since the last plan review

The following are highlights in progress to date for Koiora - Terrestrial flora and fauna (plants and animals):

- *Dactylanthus* caging project - over 100 cages are established in the Tutukau Forest. Annual visits by iwi members and DoC staff are undertaken on an annual basis to check plants and hand pollinate to create a sustainable population
- Completed wilding pine project in Tutukau/ Orakei Korako
- Completed vegetation survey and bat monitoring in Tutukau forest
- Iwi Trust Blocks Management Plans presented to Tutukau Z East, Paeroa South B1B2 and Ngati Tahu Tribal Trust (Tahorakuri Blocks). Some environmental projects have been initiated/ completed (see Whenua section)
- Corridor planting along waterways, and restoration of wetlands and mahinga kai sites signalled as projects in river restoration strategy priority planning (see Wai section)
- Scoping reports and management plans have been completed for Mangahoanga Stream, Ngatamariki Reserve, Wai-o-Tapu Scenic Reserve and Rotokawa Conservation Area; Ngatamariki is being implemented as a collaborative catchment project
- A coordinated approach has been taken to preparing a Wai-o-Tapu weed management plan involving DOC, Timberlands and the Runanga, with funding for the plan and implementation from the Waikato River Authority. The Runanga has undertaken aerial wilding conifer control in over 40 hectares of Wai-o-Tapu Scenic Reserve to protect and enhance the geothermal values of the reserve. This work was supported by WRC and Waikato River Authority
- A hunters' access track was established by DOC in the southwest section of the Paeroa Ranges to facilitate access.

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Meeting with DoC (both Rotorua and Taupo Offices) on an annual basis to discuss work schedules, projects and areas of common interest or iwi interest • Discussions continue with DOC/WRC regarding Pest Control/ 1080 in the Paeroa Ranges • An ongoing range of restoration projects underway • Plantings e.g. Te Toke rongoa plantings, Tutukau riparian areas, Nga Awa Purua restoration project (see also Wai section for lake and wetland plantings) • DOC/ WRC carrying out pest and weed control work in some bush areas (e.g. Paeroa Ranges) and in wetlands and lakeside habitats (see Wai section) and on Maunga Kakaramea • A trapping network has been established on iwi land at Wai-o-Tapu in conjunction with the Lessee • A trapping network has been established on iwi land at Ohaki wetland in conjunction with Fish and Game to enhance native bird breeding within the wetland • Working with DOC to develop and begin implementing a Conservation Management Plan at Rotokawa, including seed collection, trapping and weed control (see Snapshot in Wai section) • Ngatamariki management plan prepared in lower catchment with DOC and other landowners (links to Ngawha section) • Coordinated weed management plan for Wai-o-Tapu prepared and being implemented, including wilding pine control • Surveillance and control of dama wallabies occurring on the western side of the Rangitaiki River (Bay of Plenty and Waikato Regional Councils) • Iwi currently have skills in possum control • Workshops on track building, track maintenance • Growsafe training for weed control workers to upskill iwi members • Iwi involved with input on resource consent applications to ensure native flora and fauna are protected and enhanced where possible during developments	• Revive traditional plant and animal use through wananga, going out to collect resources and hands-on learning with rangatahi involved e.g. about rongoa, weaving, kai from the ngahere • Investigate options and feasibility for establishment of local nursery • Further pest control and manage/ prevent further incursions of new species (e.g. wallaby) • Investigate options for sanctuary/ reintroducing birds e.g. kiwi • Secure funding for planned plantings and pest control to establish planted corridors from the Paeroa Range to Te Awa o Waikato, and increase populations of tui, kereru and other native birds in Reporoa, Ohaki, Parekarangi areas* • Secure funding and fully implement Ngatamariki management plan* • Restoration over larger areas through partnerships including with regional and district councils, Fish and Game, schools and community groups • Maintain dialogue with agencies like DOC, with follow-through, to allow iwi input into planning stages of work and ensure opportunities to engage iwi and use iwi expertise • Up-skill/ certify iwi members in pest management - where possible involve iwi members in DOC operations and training • Work with iwi members to put in proposals, tenders etc for pest control and restoration work • Get more rangatahi involved in possum trapping/ fur recovery • Projects to explore and reopen tupuna tracks • Investigate options for commercial opportunities associated with natural areas e.g. as cycle tracks develop

** Identified as an iwi priority project in the Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa*

Past achievements: Restoration projects

Te Toke Road – Tahorakuri Reserve restoration

The project area was degraded land on the banks of the Waikato River which was used for rubbish dumping, had multiple weed issues and was relatively inaccessible. The area also has sites of cultural significance to Ngati Tahu-Ngati Whaoa. This project has involved three stages of restoration with work focused on weed control, planting of natives, protection of cultural sites, providing interpretive information and increasing recreational opportunities. The total planting area is 3 hectares. The work has been led by the Runanga and has involved multiple agencies and stakeholders with input from the community including schools groups and others. Funding has been provided by Waikato Catchment Ecological Enhancement Trust, Honda Tree Fund and Te Arawa River Iwi Trust. Additional support has been provided by Fonterra and Landcorp and many members of the local community. Today, the reserve is a space for all to enjoy, rescued from its rubbish dumping past with an inspiring tale of a community coming together and making a difference.

before

after

Report on biodiversity enhancement and restoration opportunities

As part of its strategy to demonstrate and expand kaitiakitanga of land within the rohe, the Runanga commissioned Wildlands Consultants to complete a series of reports detailing biodiversity enhancement opportunities within the rohe. These reports have provided direction and guidance for some exciting new initiatives, such as those described below.

Vegetation survey, bat survey and developing a restoration plan for Tutukau Forest

Tutukau East Z Trust own a large block of land comprising 2260 ha of pasture, indigenous forest, exotic plantation forest, geothermal habitat and waterways including three streams which flow into the Waikato River. The Trust land contains part of the Tutukau Forest (686 ha of the total forest area of 968 ha) which is a large example of indigenous forest. The forest itself is protected by a Nga Whenua Rahui Kawenata agreement and is classified as a Significant Natural Area (SNA) and an Amenity Landscape area in the Taupo District Plan. In 2013, the Runanga commissioned Wildlands Consultants to prepare a restoration plan for Tutukau Forest on land owned by Tutukau Z East Trust. The plan, funded by DOC's Biodiversity Condition Fund, has assisted in assessing biodiversity work and priorities at the site. A rare plant te pua o te reinga or wood rose *(Dactylanthus taylorii)* has been recorded in the Tutukau Forest. The remaining *Dactylanthus taylorii* population in the forest was surveyed in 2012 by the Runanga. Over 180 plants have been caged to protect them from possum browse and disturbance. Caging and monitoring of this population continues on an annual basis. Funding for the *Dactylanthus* work was provided by the Department of Conservation through the Biodiversity Condition Fund in 2014. As short-tail bats (ranked as 'At Risk-Declining') are thought to be the pollinators of this plant, the project has also included a bat survey to determine their presence or absence within the forest. Short-tail bats were not observed in the survey; only long-tail bats were found.

Snapshot: Orakei Korako/Red Hills Wilding Pine Control

Ngati Tahu-Ngati Whaoa Runanga Trust has undertaken substantial wildling pine control work within Orakei Korako/ Red Hills, Tutukau Forest and along the lower Mangatoetoe Stream and Waikato River. The project has been ongoing since 2012. The area where work is currently underway has high biodiversity values as well as geothermal features and covers areas along the margins of the Waikato River. Control of wilding pine and other weeds will assist in restoring and protecting these values. This area is also of great importance to Ngati Tahu-Ngati Whaoa as the ukaipo or birthplace of the iwi. Control of wilding pine is assisting in protecting and enhancing cultural values. Work is now in its fifth year and the progress made to date is very visible on the landscape. Further ongoing maintenance will be required into the future. This project is funded by the Waikato River Authority. Additional funds have been provided over time by Waikato Catchment Ecological Enhancement Trust, Department of Conservation (Biodiversity Condition Fund), Mighty River Power (now Mercury), and Te Arawa River Iwi Trust.

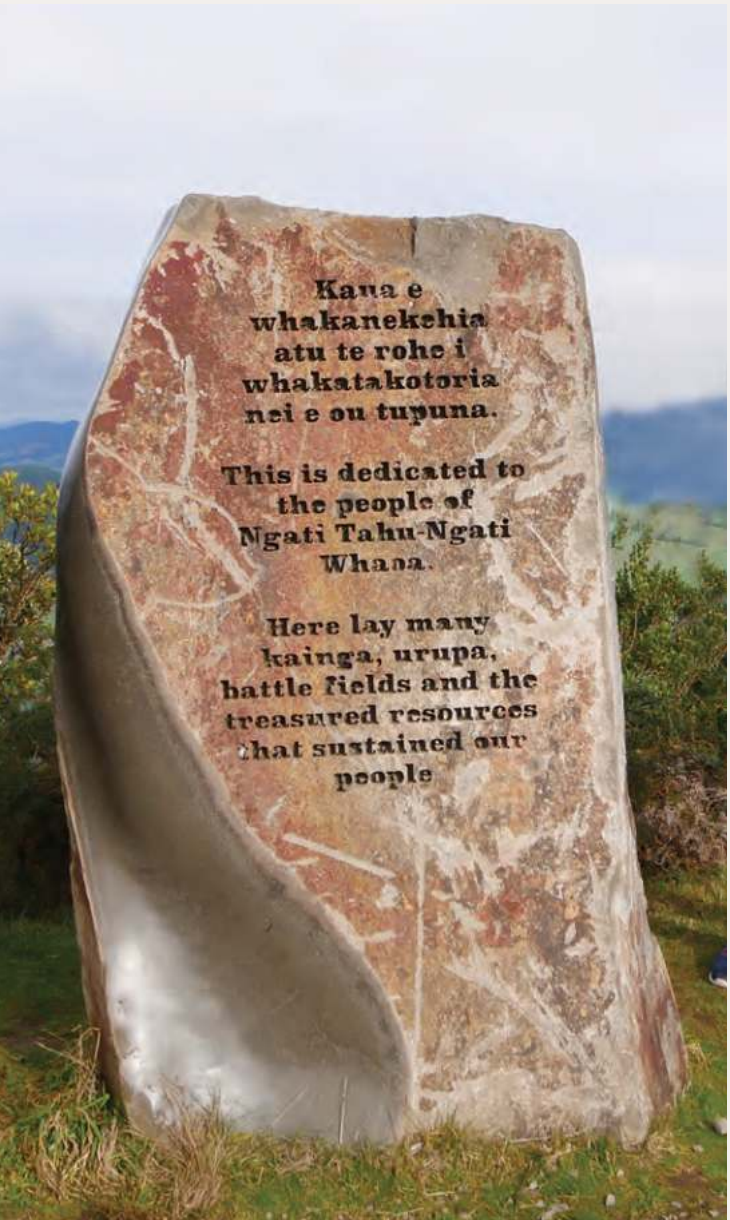
WHENUA – LAND AND LAND USE

Opportunities: How to preserve and restore the resource

Stock exclusion, nutrient management and Farm Environment Plans will be a key part of implementing the Healthy Rivers Wai Ora process (Waikato Regional Plan Change 1). There are opportunities for land Trusts to identify further areas of land they wish to protect, either because they have wahi tapu or because they are unproductive or vulnerable to erosion. There are opportunities to retire less productive land and re-establish tree cover on it, and then concentrate farm inputs on the more productive land as long as there is no net increase in loss of nutrients, sediment and faecal microbes.

Extending the area of native tree cover would provide more habitat for native species, and could also offer potential for honey production or future harvest of timber and cultural resources.

There is an opportunity to establish a nursery to grow native species for planting buffer areas beside waterways or in retired areas.



Progress: What has happened since the last plan review

- The following are highlights in progress to date for Whenua – Land and land use:
- Vaile and Tutukau Reserves returned to iwi ownership
- Iwi Trust Block Management Plans presented to Tutukau Z East, Paeroa South B1B2 and Ngati Tahu Tribal Trust (Tahorakuri Blocks). Some environmental projects have been initiated/ completed (relates to Koiora)
- Reserve Management Plans being prepared to guide management of iwi land at Wai-o-apu and Ruatihi o Paeroa Scenic Reserves.

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Riparian, unproductive and eroding areas are being fenced and retired (WRC assisting/ BOPRC in Rangitaiki) • Farm Trust blocks implementing a mix of land use – forestry, stock, native vegetation • Farm Trusts are expanding and improving production • Farms have some plans in place o Health and Safety plans o Product register for meat companies o Managers with chemical licenses • Iwi participating in the Healthy Rivers: Wai Ora process (Waikato Regional Plan Change 1), which proposes Farm Environment Plans and stock exclusion rules for all farming properties • The Whirinaki catchment has been prioritised by Waikato Regional Council for sediment control and river management under the Upper Waikato Zone Plan and work is underway to carry out fencing, planting and targeted river works that will enhance water quality in the Whirinaki Arm of the Waikato River and Lake Ohakuri	• Work with iwi blocks and land trusts on developing and implementing Farm Environment Plans for sustainable land use and waterway protection o nutrient management o soil conservation o riparian retirement and planting o alternative crops or income streams and long-term plantings o Use visual information for all farm plans • Secure resourcing for a support person to work with land Trusts to develop restoration strategies, implement restoration activities and achieve sustainability outcomes* • Advocate for other farms to develop and implement robust Farm Environment Plans which will assist in achieving the Vision and Strategy for the Waikato River • Identify how/ where access can be improved, and negotiate access with landowners • Work with district councils on land zoning for papakainga development, avoiding development in natural hazard areas and wahi tapu, effective waste reduction programmes and appropriate siting of renewable energy developments such as wind farms • Work with regional councils to reduce the rate of land clearance and minimise effects of mining and quarrying • Advocate for reducing cadmium in phosphate fertiliser • Advocate to keep the rohe free from the release of genetically modified organisms

* *Identified as an iwi priority project in the Waikato and Waipa River Restoration Strategy: Te Rautaki Tamata i Nga Awa o Waikato me Waipa*

MAHI NGAHERE – FORESTRY

Opportunities: How to preserve and restore the resource

The Central North Island forest negotiations provide the opportunity for return of forest and land assets to Ngati Tahu-Ngati Whaoa, and for benefits to begin to flow to the iwi.

There are opportunities to work with forestry companies to achieve best management practices, especially where those companies hold FSC certification. These could include leaving unplanted riparian buffers by waterways, low-impact harvest practices, siting of earthworks, and protocols for wahi tapu identification, mapping, and management, including procedures for accidental discovery. Wahi tapu sites could be cleaned up carefully and planted with a marker species that would signal to workers on the ground that these areas should not be disturbed.

The iwi could also work with the forest managers on identifying employment and training opportunities and on access and patrolling opportunities for iwi members.

More areas of native forestry could be included on iwi blocks. If these are intended for future harvest of logs, the plantings should be registered with the local district council as a planted forest for timber purposes, to reduce the risk that planning regulations will prevent them from being harvested in future. If carbon prices increase over time, carbon farming could provide an alternative income from native forests (where ETS credits are earned for the carbon that the trees capture from the air).

Progress: What has happened since the last plan review

The following are highlights in progress to date for Mahi ngahere - Forestry:

- Interests in CNI forests recognised: A panel of 3 commissioners used a Mana Whenua process to recognise and allocate land interests within the CNI block, including the interests of Ngati Tahu–Ngati Whaoa (see Snapshot in Recognition and representation section)
- MOU with forest operators in the rohe: Working with Timberlands to coordinate logging operations on iwi land around Waiotapu and to identify and protect wahi tapu and significant sites in other forestry blocks (see Snapshot below)
- Collaborative approach to weed management for Waiotapu and Whangioterangi/ Echo Lake being taken by the Runanga, DOC and Timberlands (see Ngawha section).

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Iwi engaged in negotiations for Central North Island forests • Relationship and understanding with large local forest managers (Hancock Forest Management, Timberlands) for the management of wahi tapu sites • Co-ordinated work, harvesting trees on land belonging to Ngati Tahu-Ngati Whaoa in conjunction with scheduled Timberlands operations • Collaborating on a weed management plan for Wai-o-Tapu area including Timberlands and DOC (links to Ngawha and Koiora) – considering the use of logging income to help implement this plan • Extensive native tree plantings to expand areas of native forest at Nga Awa Purua, Te Toke, Ohaki wetland, Hardcastles, and Mangatoetoe restoration projects (see Koiora and Wai sections) • Farm forestry part of plans for iwi farmland blocks (see Whenua section)	• Establish protocols/ relationships with all major forest managers • Ensure wahi tapu are registered both on iwi system and on systems used by forestry companies and their contractors • Initiate, in partnership with forest managers, more projects to identify, mark/ fence, clean up and restore wahi tapu in forests • Regular visits to wahi tapu/ historical sites within forests, enabling iwi to retain and build on historical knowledge (generation to generation) • Negotiate access for iwi to mahinga kai and significant sites within forest blocks • Investigate options for iwi involvement in monitoring of forest blocks and their management • Continue work with iwi land Trusts to include native forestry plantings on farms suitable for future iwi use such as for pou/ carvings • Investigate options for carbon farming

Working together in forestry lands: Timberlands and Ngati Tahu-Ngati Whaoa

Timberlands Limited holds forestry rights for Kaingaroa Forest, located on Central North Island Iwi Holdings' land. Because a portion of the area subject to Timberlands' forestry operations and conservation efforts lies within the rohe of Ngati Tahu-Ngati Whaoa, Timberlands works closely with Ngati Tahu-Ngati Whaoa Runanga Trust. A funding application to the Waikato River Authority was developed collaboratively between Timberlands, the Runanga and the DOC to manage geothermal areas around Wai-o-Tapu with high conservation value. Timberlands also worked with the Runanga to remove plantation species adjacent to Timberlands-managed forests, enabling the Runanga to better manage their own land Timberlands seeks input from Ngati Tahu-Ngati Whaoa regarding the potential cultural or environmental effects of forestry operations, checking areas prior to harvesting where cultural values may exist, and working together to find solutions around sensitive areas like Lake Whangioterangi.

Colin Maunder of Timberlands says "The Runanga has offered practical and well-considered solutions to help guide our approach. Our relationship is very positive, in particular where we are working on matters of mutual benefit, but also where matters of concern are being resolved. The Runanga is always responsive to our approaches, making it a pleasure to work collaboratively with them."

Whano, whano
Haramai te toki
Haumi e, Hui e, Taiki e

Proceed, progress! Come to me my axe.
Join together! Gather together! Unite together!

RANGI – AIR AND ATMOSPHERE

Opportunities: How to preserve and restore the resource

While New Zealand is a small emitter of the gases responsible for climate change, the government has signalled that reducing emissions will be a priority in coming years. Iwi land managers can consider strategies to reduce local emissions of these gases and to capture carbon dioxide through vegetation that acts as a 'carbon sink'. This might include retaining forested areas and expanding plantings, control of browsing pests and exploring bio-fuel tree crops (which are considered carbon neutral as they trap carbon while growing and then release it when they are burnt for fuel). The iwi can advocate for an Emissions Trading Scheme that rewards forest owners.

Geothermal electricity generation or heating, solar panels and solar hot water systems can reduce the national demand for thermal electricity generation from coal and gas, thereby reducing overall emissions. Emissions of methane come largely from agricultural animals; research is currently being conducted into how these can be reduced.

Another concern with air quality is the pollution from poorly performing wood burners. Burning only dry wood or switching to another heat source are opportunities to reduce any localised air pollution.

Progress: What has happened since the last plan review

- The Runanga is aware of climate change issues and upcoming changes in government policy/ legislation
- Farm plans and restoration projects are being implemented including long-term plantings that can act as 'carbon sinks'
- Pest control in forest areas will help existing forests to grow vigorously and capture more carbon
- Local geothermal electricity developments are coming on-stream - contributing to replacing fossil fuel use nationally.

Mahi wa tu – Current actions	Mahi wa heke – Action ideas for future
• Geothermal electricity generation from local fields • Bio-fuels are being researched and trialled locally (e.g. in Taupo) • Discharges to air in the rohe are controlled by consents; the Runanga has input into these consents and is advocating for iwi values • The Emissions Trading Scheme deters deforestation, except when the price of carbon is low; the government is progressing new legislation to set more stringent emissions targets	• Advocate for effective emissions control measures that reward forest owners • Investigate bio-fuels, especially from trees as alternative crops because trees have low environmental impact in terms of discharge to water, protection of land and emissions • Adopt methane reduction technologies on iwi land blocks, as they become available • Monitor opportunities for carbon farming as an income stream and take these opportunities if they become viable • Investigate opportunities for solar electricity or water heating and geothermal heating for marae and community housing

NGA Manu O TO AO

Our Future Leaders

Kei hea, kei hea nga manu o te ao?	**Where are our future leaders?** **Where are the birds of the world?** *The generation that seek the benefits of education*
Nga manu ka kai i te matauranga?	**The birds that reap the benefits of education?** *The artistic*
E Ko te tui	**Like the songbird Tui** *The academic*
E ko te kea	**The intelligent Kea** *The rarest intellectual students of all*
E ko te manu kotuku e	**And like the rare white heron**
I a ha ha	**Oh, where are you?** *Listen to the advice of your superiors*
Ka rongo, ka rongo ki nga tohu a Tane	**Listen, listen to the wisdom of Tane** *Aim high*
Topa atu ki te rangi	**Soar to the sky** *Dream big*
Ohia te ao	**Dream of the world** *Stand strong*
Kia tu marohi	**Stand vigorously** *And remain true to yourself*
Hei rakau kohure	**As you develop into a tree of maturity** *My fellow peers, the most important people of all*
Nga hoa rangatahi, upoko whakahirahira	**My friends, the important faces of all** *Rise up and represent your people*
Kia tu, kia tu mo to iwi e	**Stand up, stand up for your tribe/family/school** *I know there is only one person who receives a reward.*
I a ha ha	**My reputation as an achiever is not due to my efforts alone,** *However, there are many of us that can strive for that same goal.*
Ehara taku toa he toa takitahi	**But rather it was achieved through many others assisting me.** *Oh yes, oh yes, we can*
He toa takitini, taku toa e	**So if I can do it** *Oh yes we can, together!*
Ana, ana, aue	**You can too, together!**
Ana, ana, aue HI!	

Authors Felicity Nepia / Rangitahi o Reporoa Kareti.

Charles Blomfield. *Orakei Korako on the Waikato 1885.* Museum of New Zealand Te Papa Tongarewa. Registration No 1994-0012-1

NGATI TAHU-NGATI WHAOA
RUNANGA