



TŪWHARETOA
MĀORI TRUST BOARD

HE MAHERE IKA O TE AWA RUNGA O WAIKATO KI NGĀTI TŪWHARETOA

NGĀTI TŪWHARETOA UPPER WAIKATO RIVER

Fisheries Plan

2025

MIHIMIHI

foreword

**Mai i ngā Pae Maunga o Tongariro ki
Te Moana-tāpokopoko-a-Tāwhaki
Ko Waikato te awa, he awa tūpuna he ara wairua!**

He Mahere Ika o te Awa Runga o Waikato ki Ngāti Tūwharetoa

this fisheries plan

This Fisheries Plan applies to the part of the Waikato Awa that falls within the rohe of Ngāti Tūwharetoa and is located within the boundaries of the Upper Waikato River Catchment Area.

It is enabled by the 2010 Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act, which permits each of the Trusts to prepare an environmental plan.

It was prepared by Ngā Kaihautū o te Awa o Waikato (Ngā Kaihautū) on behalf of the Tūwharetoa Māori Trust Board (‘TMTB’ or ‘the Trust Board’).

Ngā Kaihautū are comprised of members from Pākira, Waipāhīhī, Mōkai, Nukuhau Pā, Te Rangiita, Maroa-nui-a-Tia, Te Kapa o Te Rangiita, and Tūtetawhā Marae. The marae representatives ensure the interests of their people are represented in the development of this plan.

This plan has been prepared for the iwi of Ngāti Tūwharetoa. Local kaitiaki and hapū management plans offer a more in-depth discussion of values, issues, and aspirations at the hapū and marae levels.

Kāhu Environmental Ltd were engaged to facilitate and draft this Fisheries Plan.

The Waikato River Authority provided funding for the development of this plan.

The Trust Board adopted the Fisheries Plan on:

It was served on the Director-General of Conservation, the chief executive of the Ministry of Fisheries, the Taupō District Council and the Waikato Regional Council on:

It was served on the Royal Forest and Bird Protection Society of New Zealand (Forest and Bird and the Taupō Fish and Game Council on:

Ngāti Tūwharetoa Upper Waikato River Fisheries Plan

legal effect

For the avoidance of doubt:

- This plan is an ‘environmental plan’ for the purposes of the Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010.
- For the purposes of the Resource Management Act 1991 (RMA), this Fisheries Plan is a ‘planning document’ recognised by the Tūwharetoa Māori Trust Board, in its capacity as an iwi authority.
- Any person carrying out functions or exercising powers under Sections 12-14 of the Fisheries Act 1996 must recognise and provide for the Plan.
- The Minister for Primary Industries must have particular regard to the Plan when making sustainability measures that relate to the Upper Waikato River.
- Any person exercising powers and authority under the Upper Waikato River Fisheries Regulations must act consistently with the Plan.
- Any person carrying out functions or exercising powers under the Conservation Act 1987 and enactments listed in Schedule One to that Act must have particular regard to the plan to the extent to which its contents relate to the functions or powers.
- As a recognised iwi planning document, regional and district councils are required to take the Plan into account when preparing or changing a district or regional plan or regional policy statement under the RMA.
- A consent authority (usually a regional or district council) considering an application for a resource consent under section 104 of the RMA must have regard to the plan if it considers s104(1)(c) applies to the plan (in other words, if it considers the Fisheries Plan is relevant and reasonably necessary in order to reach a decision).

CONTENTS

1	INTRODUCTION	8
1.1	Background	9
1.2	Vision and purpose	12
1.3	Ko wai mātou / who we are	13
2	WIDER CONTEXT	20
2.1	ACTS AND REGULATIONS	21
2.2	Te Tiriti o Waitangi	26
2.3	Statutory plans and documents	28
2.4	Fisheries management in Aotearoa	31
2.5	Geographic application	36
3	ACNOWLEDGEMENT	40
4	NGĀTI TŪWHARETOA	42
4.1	Statement of significance	43
4.2	Values associated with the Waikato Awa	44
4.3	Wāhi tūpuna	46
4.4	Traditional methods for collecting kai	66
4.5	Traditional management tools	72
5	SPECIES	74
5.1	Who is living here?	75
5.2	Kōura	80

5.3	Kōaro	82
5.4	Kākahi	84
5.5	Tuna	87
5.6	Īnanga	88
5.7	Toitoi (Bullies)	90
5.8	Banded kōkopu	91
5.9	Piharau	92
5.10	Ngaore (Common smelt)	93
5.11	Trout	94
5.12	Goldfish	95
5.13	Guppy	96
5.14	Rudd	97
5.15	Gambusia	98
5.16	Brown bull-headed catfish	99
6	ISSUES AND THREATS	100
7	OBJECTIVES, POLICIES AND METHODS	118
7.1	Ngā tūmanako	119
7.2	Ngāti Tūwharetoa objectives and policies	122
8	REPORTING	136
9	REFERENCES	138
10	APPENDICES	144



1 INTRODUCTION

about us

1.1 Background

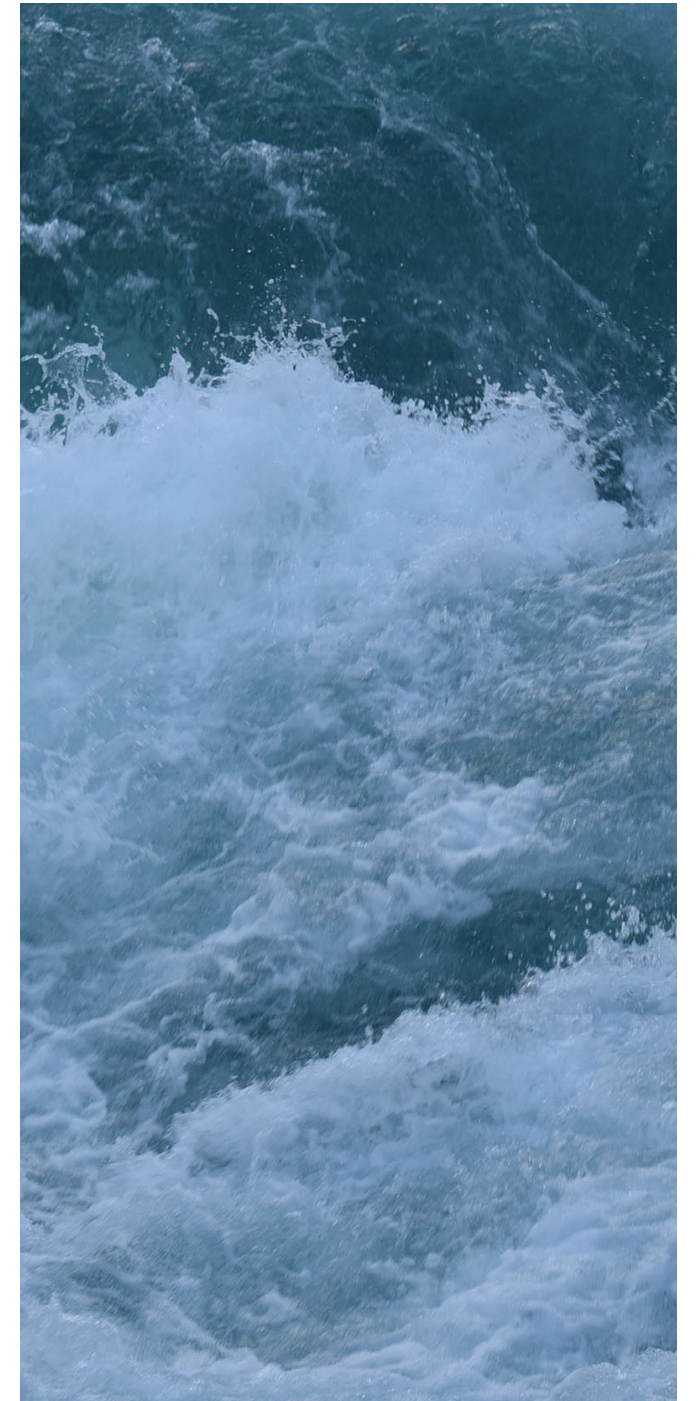
Ngāti Tūwharetoa are the ancestral owners of the Tongariro / Taupō region.

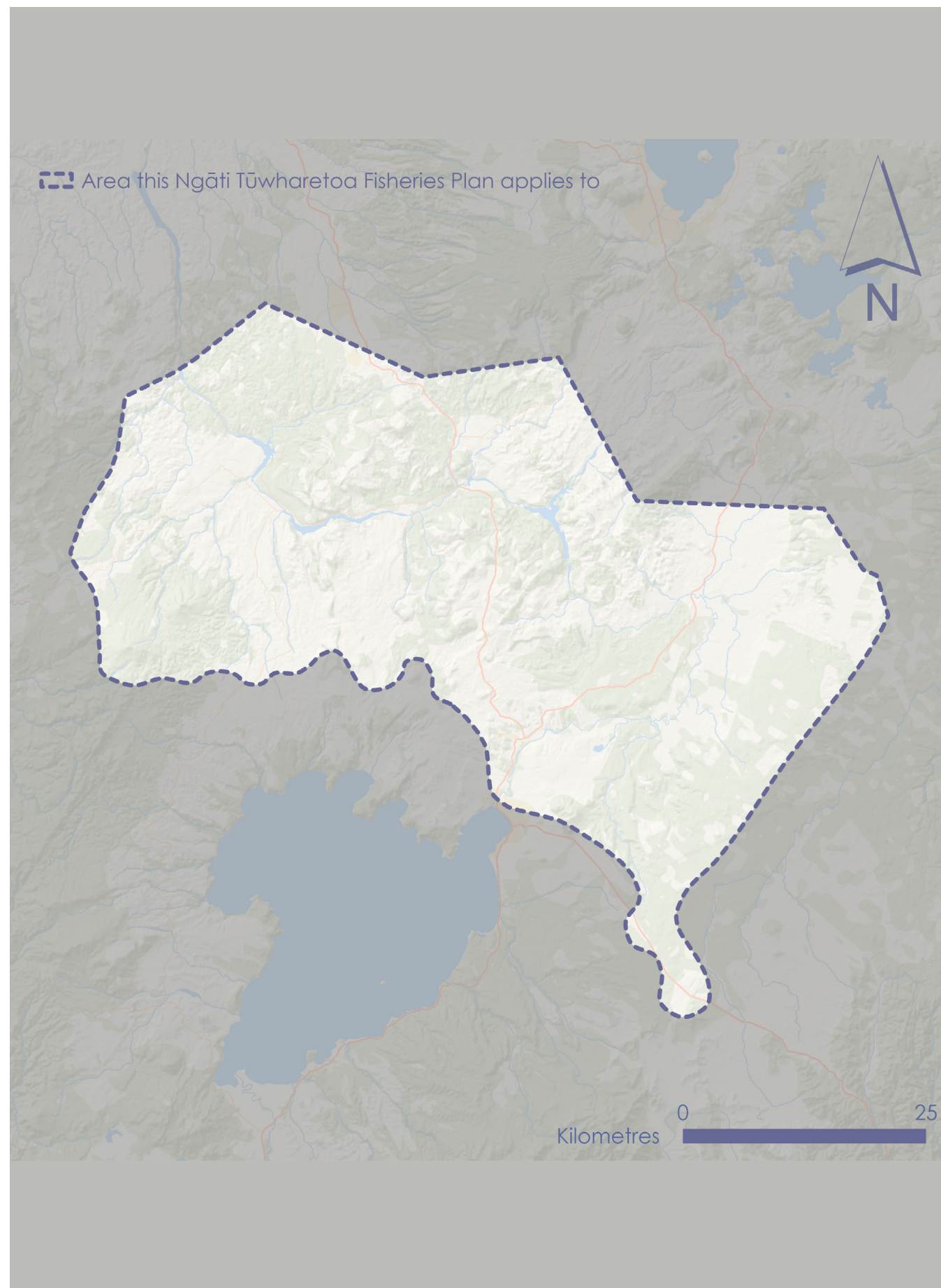
Enacted in 2010, the Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act ('Waikato River Iwi Act') recognised the significance of the Waikato River to Ngāti Tūwharetoa and their whanaunga iwi and provided for co-management of the Waikato River.

The Act enables each Trust to develop its own environmental plan and enter into joint management agreements.

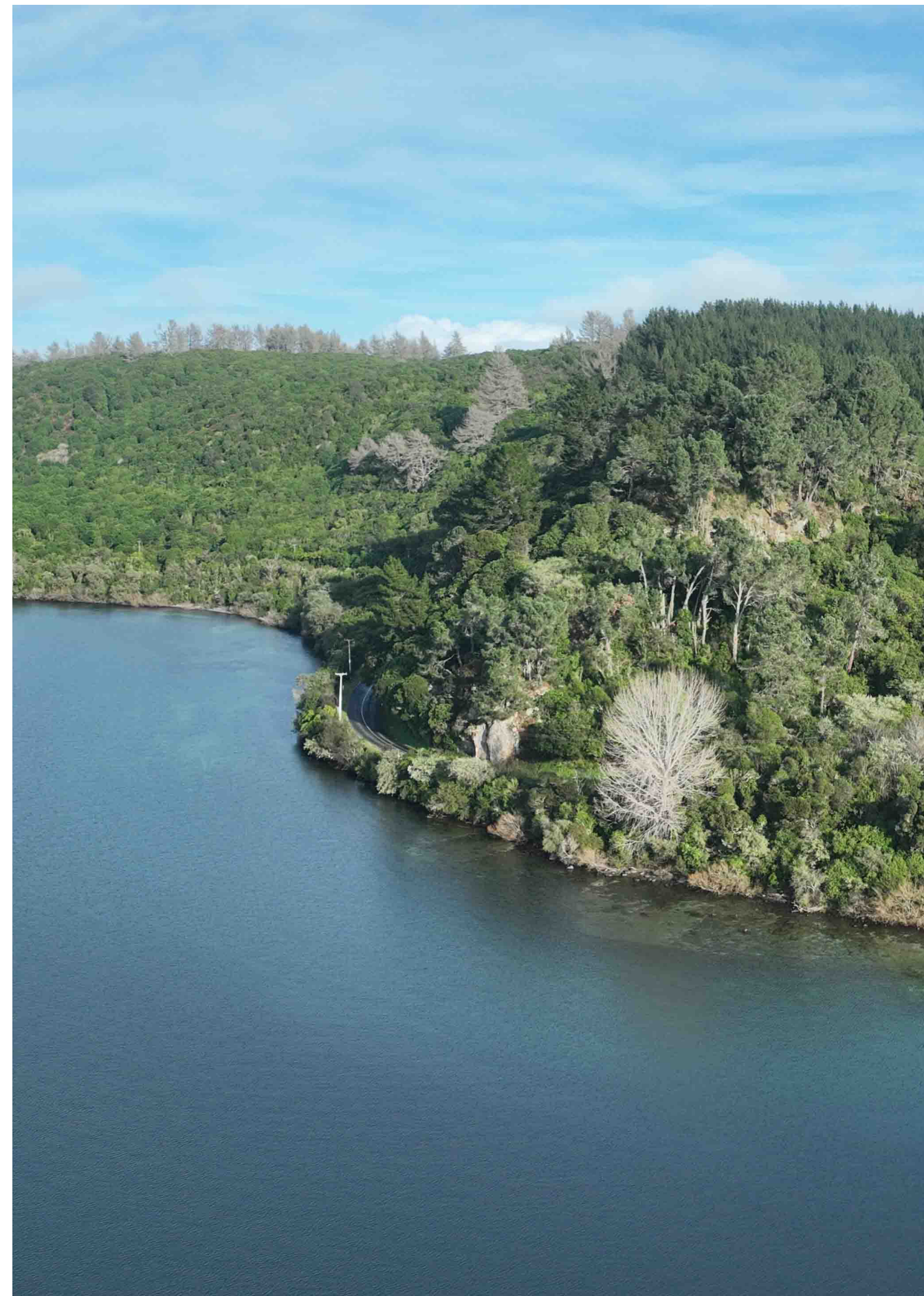
This Fisheries Plan has been prepared by the Tūwharetoa Māori Trust Board ('TMTB' or 'the Trust') on behalf of ngā hapū o Tūwharetoa.

It is enabled by the Waikato River Iwi Act, and has been prepared in accordance with Te Ture Whaimana o te Awa o Waikato. It applies to the Upper Waikato River Catchment Area, as it falls within the rohe of Ngāti Tūwharetoa (Fig.1).

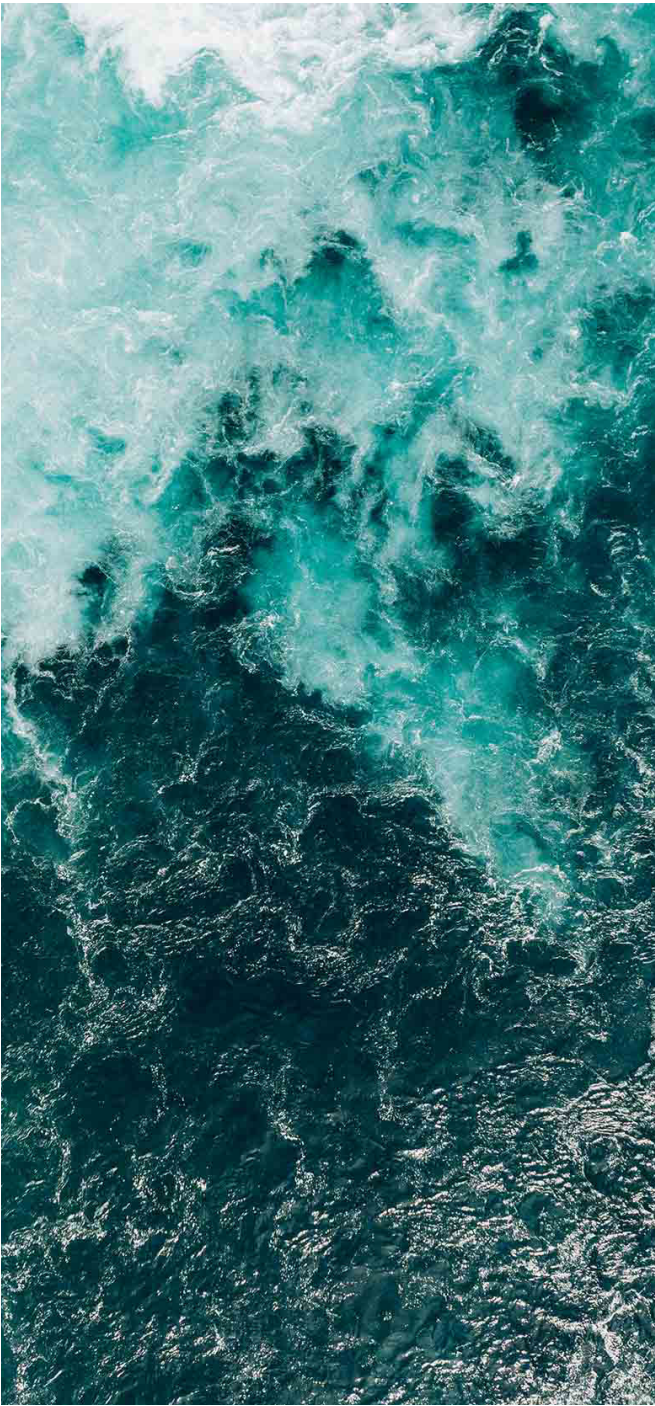




1. The area this Ngāti Tūwharetoa Fisheries Plan applies to



1.2 Vision and purpose



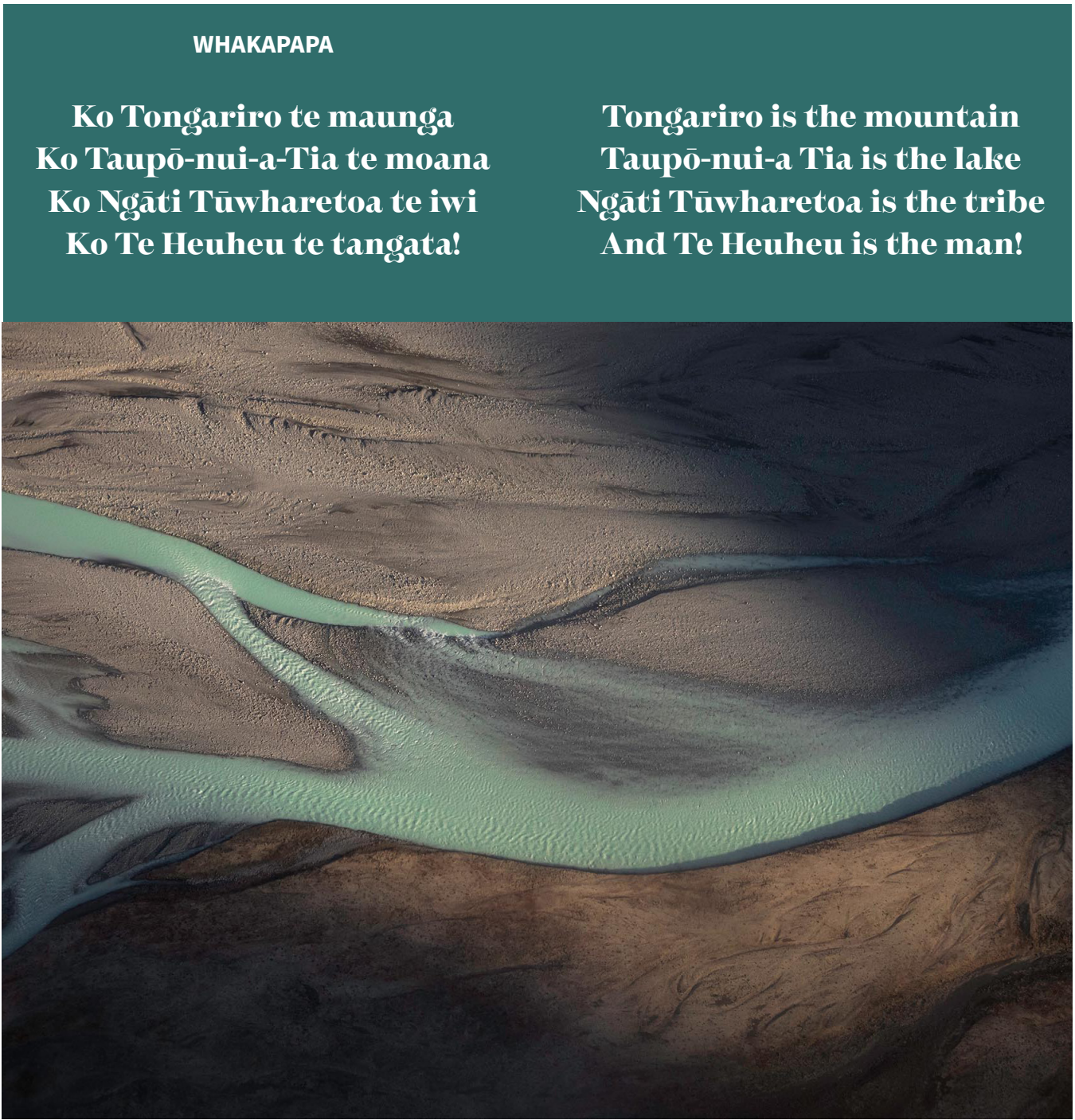
The purpose of this Upper Waikato River Fisheries Plan is for Ngāti Tūwharetoa to:

- Record our mātauranga (knowledge) and kōrero tuku iho (historical accounts) concerning the wai and the surrounding taiao
- Describe our customary species and their habitat
- Document our values associated with wai māori, including customary practices such as hī ika (fishing) and mahinga kai (food gathering)
- Outline key issues and threats facing valued taonga species and customary practices
- Articulate aspirations, objectives and policies that will guide the restoration and enhancement of the wai and its freshwater fisheries, and
- Explore opportunities to manage commercial and customary harvest.

Te Ture Whaimana o te Awa o Waikato is the overarching document that sets the direction for the Waikato Awa.

This Fisheries Plan gives effect to the Vision and Strategy and endeavours to help achieve the objectives and actions within the document as they relate to the Ngāti Tūwharetoa rohe.

1.3 Ko wai mātou / who we are



WHAKAPAPA

**Ko Tongariro te maunga
Ko Taupō-nui-a-Tia te moana
Ko Ngāti Tūwharetoa te iwi
Ko Te Heuheu te tangata!**

**Tongariro is the mountain
Taupō-nui-a Tia is the lake
Ngāti Tūwharetoa is the tribe
And Te Heuheu is the man!**

WHAKAPAPA

Ngāti Tūwharetoa are the descendants of Ngātoroirangi, Tia, Kurapoto and other tūpuna who have occupied the Taupō rohe since the arrival of Te Arawa waka. We are linked by whakapapa to our tūpuna, lands and taonga.

Ngāti Tūwharetoa ancestral legacies such as tikanga (custom), kōrero tūpuna (traditions), mātauranga (knowledge), and ingoa tūturu (original names) are some of the many mechanisms that establish our mana whenua, kaitiakitanga, and rangatiratanga as a continuation of our whakapapa in contemporary times.



These legacies include those of Ngātoroirangi, tohunga of the Te Arawa waka, and his karakia uru whenua, which sets the standard for our kaitiakitanga in protecting the mauri of our taonga for future generations. The tūāhu he established on Tauhara Maunga is dedicated to Ikatere, the kaitiaki entrusted to protect the fish species in Taupō Moana.

The legacy of Tia, another tohunga of the Te Arawa waka, also emanates throughout our traditions, notably through the names of our wai. This can be seen at places such as Ātiamuri, Aratiatia, Waipāhīhī-a-Tia, Tapuwaeharuru-a-Tia, Taupō-nui-ā-Tia.

These legacies establish and maintain our right to meaningful and sustainable relationships between our whānau, hapū, marae and their taonga, their wai and their kai.

Naming of the Waikato River

According to kōrero tuku iho (oral history), the name ‘Waikato’ was given by Ngāti Tūwharetoa tupuna Ngātoroirangi. Legend tells how Taupiri Maunga became ill and sent a kaitiaki to Tongariro Maunga to ask for special healing waters. Tongariro responded, sending waters from a sacred cave. The kaitiaki travelled and led the waters all the way to Taupiri, which is where the awa received its name: ‘te wai ka tō’, which translates to ‘the river that was pulled’.

OUR CONNECTION TO THE WAI

Our legend describes how Tāne entrusted the guardianship of waterways to Tangaroa, while Tāwhirimātea was assigned protection over the atmospheric forms of wai and āhua o te rangi (weather). These two atua (gods) hold the mauri of this wai. For Ngāti Tūwharetoa, our ancestor Papatūānuku is at the heart of our rohe, and Ranginui is present in the atmosphere that surrounds us and the universe above us.

The mātāpuna (source) of the Waikato Awa is our maunga Ruapehu, where the awa begins its journey as Waikato-iti (also known as the ‘Upper Waikato Stream’). This joins the Tongariro River, which then enters our taonga tuku iho (ancestral treasure), Taupō nui-ā-Tia. At the outlet of the moana, near Nukuhau, the Waikato Awa continues its path north.



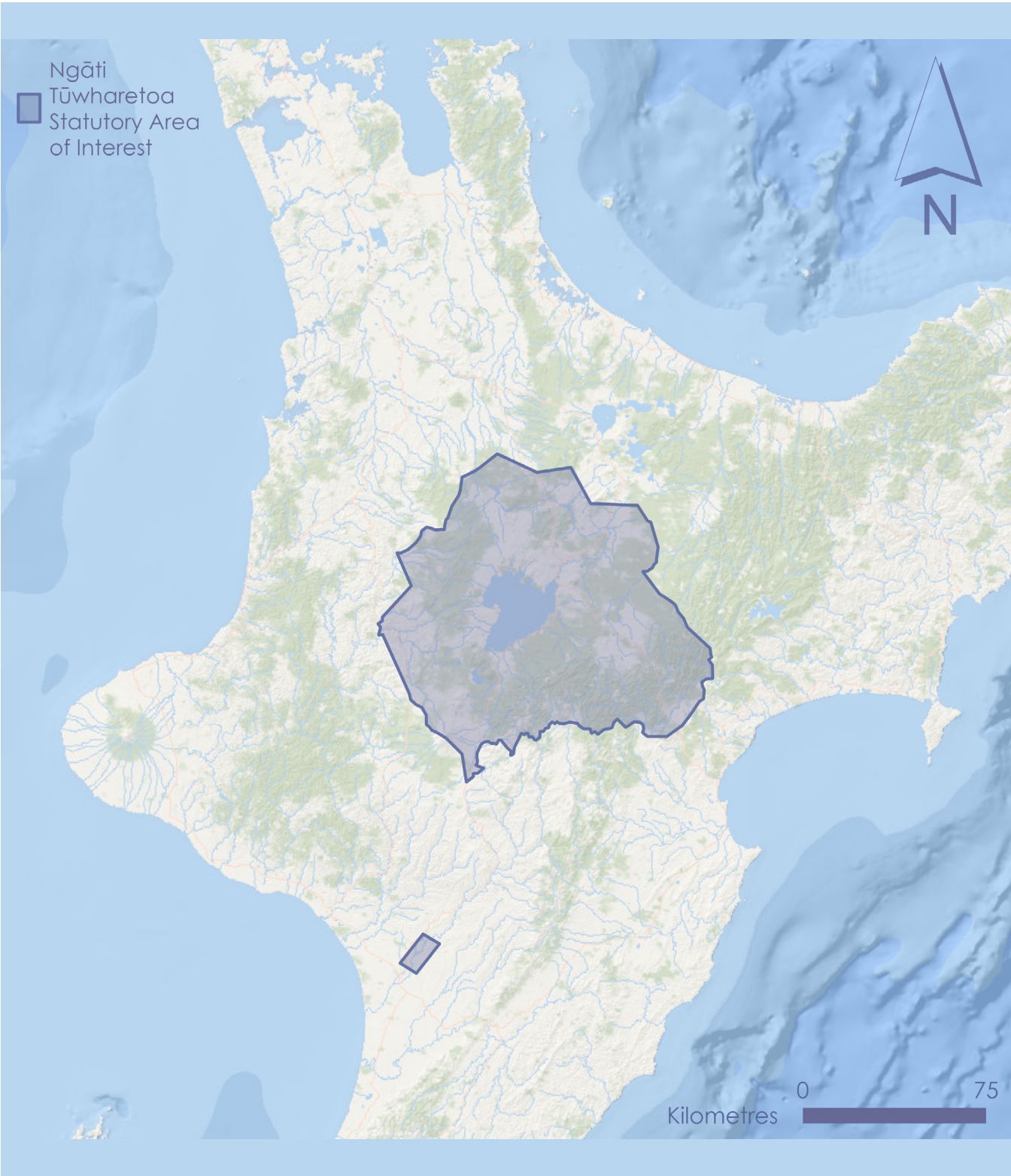
TE ROHE O NGĀTI TŪWHARETOA

The Ngāti Tūwharetoa rohe (tribal territory) is found in the central North Island, surrounding Taupō Moana and its catchment.

Originally, in 1992 and again in 2007, a Deed of Settlement was signed between TMTB and the Crown, formally recognising the Trust as the legal owners of the Taupō waters on behalf of present and future generations of Ngāti Tūwharetoa. This includes the bed of:

- Lake Taupō (and certain tributaries flowing into the lake), and
- The Waikato River (from the control gates bridge to Te Toka-a-Tia (the Rock of Tia).

Our Statutory Area of Interest (‘AOI’) as recorded in the 2017 Ngāti Tūwharetoa Deed of Settlement (‘2017 Deed’) is shown in Fig.2.



2. Map showing Ngāti Tūwharetoa Statutory Area of Interest (Data sourced from Te Puni Kōkiri, Ministry of Māori Development)

ORGANISATIONAL STRUCTURE

Tūwharetoa Māori Trust Board

The TMTB was first established in 1926 and is the legal entity that represents Ngāti Tūwharetoa for the purposes of the Resource Management Act 1991 (RMA).

Ngā Kaihautū o te Awa o Waikato

In 2015, a working group called Ngā Kaihautū was established to protect and restore the Waikato River and its wider catchment, as well as its associated ecosystems. The group consists of representatives from:

- Pākira Marae
- Tūtetawhā Marae
- Waipāhīhī Marae
- Nukuhau Pā
- Te Rangiita Marae
- Te Kapa o Te Rangiita ki Ōruanui
- Maroa-nui-a-Tia Marae
- Mōkai Marae.

Fig. 3 shows the location of each marae.



3. Map showing location of marae within the group

The primary purpose of the Ngā Kaihautū group is to assist the Trust Board in achieving the aspirations and outcomes for the Waikato River, which are set out in the:

- Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010
- Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010, and
- Te Ture Whaimana (the Vision and Strategy for the Waikato River).

DOCUMENTS / PLANS

Ngāti Tūwharetoa Claims Settlement Act 2018

This is the final settlement of the historical claims of Ngāti Tūwharetoa. The legislation acknowledges the Crown’s failure to honour its obligations under Te Tiriti o Waitangi, and that this has adversely affected every generation of Ngāti Tūwharetoa since 1840. Six Statutory Acknowledgements resulted from the settlement, one of which is for the Waikato River and its tributaries within the Ngāti Tūwharetoa area of interest.

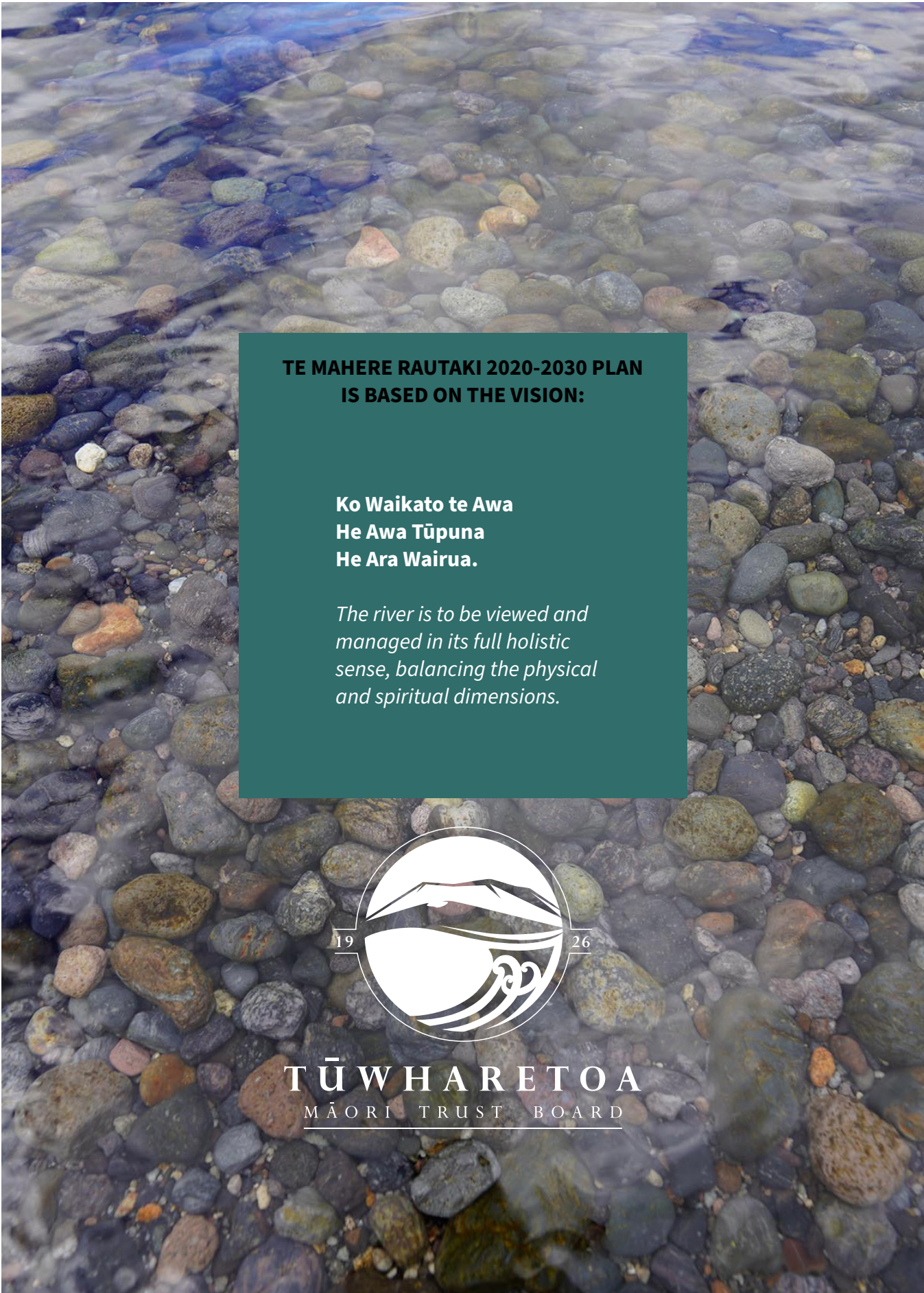
Environmental Management Plan

The Trust Board is responsible for preparing the overarching resource management document, the Ngāti Tūwharetoa Environmental Iwi Management Plan (‘EIMP’), which was published in 2003. This document builds upon the foundations established in Ngā hapū o Ngāti Tūwharetoa Environmental Strategic Plan 2000 (‘Ngāti Tūwharetoa ESP’).

The EIMP establishes Ngāti Tūwharetoa environmental bottom lines and provides tools that will help hapū, whānau and the wider iwi to achieve and protect those baselines. The plan seeks to protect the wai and wider taiao in the rohe, founded in Ngāti Tūwharetoa tikanga and kawa.

Te Mahere Rautaki

Te Mahere Rautaki 2020-2030 is a strategic plan developed by Ngā Kaihautū, which promotes the holistic management of the Waikato Awa and its surrounding environment.





2 WIDER CONTEXT

our statutory support

2.1 ACTS AND REGULATIONS

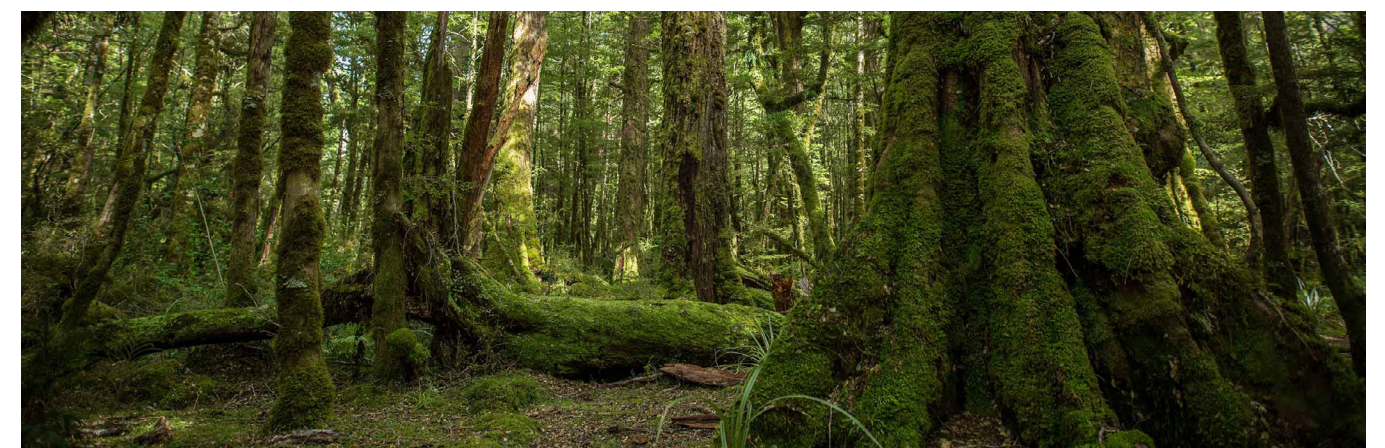
NGĀTI TŪWHARETOA, RAUKAWA, AND TE ARAWA RIVER IWI WAIKATO RIVER ACT 2010

This Fisheries Plan is considered an ‘environmental plan’ under the Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010 (‘Waikato River Act’).

An environmental plan prepared under the Waikato River Act has the following legal effect:

- Any person carrying out functions or exercising powers under Sections 12-14 of the **Fisheries Act 1996** must recognise and provide for the Plan.
- Any person carrying out functions or exercising powers under the **Conservation Act 1987** and enactments listed in Schedule One to that Act must have particular regard to the plan to the extent to which its contents relate to the functions or powers.

- As a recognised iwi planning document, **regional and district councils** are required to take the Plan into account when preparing or changing a district or regional plan or regional policy statement under the **RMA**.
- A **consent authority** (usually a regional or district council) considering an application for a resource consent under section 104 of the **RMA** must have regard to the plan if it considers s104(1)(c) applies to the plan (in other words, if it considers the Fisheries Plan is relevant and reasonably necessary in order to reach a decision).



FISHERIES (NGĀTI TŪWHARETOA, RAUKAWA, AND TE ARAWA RIVER IWI) REGULATIONS 2017

The Fisheries (Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi) Regulations 2017 ('Fisheries Regulations') outline the three iwi entities that have agreed to co-management of the Upper Waikato Fisheries Area (see Figure 1), which are:

- Te Arawa River Iwi Trust ('TARIT')
- Ngāti Raukawa Charitable Trust, and
- Ngāti Tūwharetoa Māori Trust Board.



The Fisheries Regulations seek to:

“

... protect, restore, manage, and enhance the fisheries resources of the Waikato River and ... in doing so, enable customary practices that are consistent with the tikanga and kawa of each of Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi.

”

These regulations prevail over any regulations in the Fisheries Act if they are inconsistent.

Customary authorisations

The Fisheries Regulations enable Ngāti Tūwharetoa to appoint kaitiaki or 'customary authorisers' and manage the issuing of 'customary authorisations'.

Customary authorisations permit the holder to carry out 'customary gathering' in the Upper Waikato Fisheries Area, which includes:

- The taking and/or releasing of fisheries resources
- Using and/or possessing fisheries resources
- Depositing fisheries resources in, or removing from, pātaka kai or pā tuna.

The customary gathering can be authorised for:

- A 'customary purpose' which means:
 - ▷ providing food at a hui or tangihanga
 - ▷ sustaining the functions of a marae, or
 - ▷ any other customary purpose in accordance with the tikanga or kawa of the iwi whose Trust or customary authoriser issues the customary authorisation

- educational research
- environmental research
- enhancing species, or
- restoring species.

Bylaws

The Fisheries Regulations also enable the Trust to recommend bylaws to the Minister that may restrict or prohibit fishing in parts of the Waikato River system.

The restrictions must be necessary for sustainable utilisation, or cultural reasons, such as:

- traditional management practices
- the death of a person
- the special status of a species of fisheries resource in the Upper Waikato fisheries area, or
- the need to increase the availability of a species of fisheries resource in a particular area in the Upper Waikato fisheries area.

FISHERIES ACT 1996

The purpose of the Fisheries Act is to provide for:

“The utilisation of fisheries resources while ensuring sustainability.”

In relation to customary fishing, the Fisheries Act recognises and provides for:

“Customary food gathering by Māori and the special relationship between tangata whenua and places of importance for customary food gathering (including tauranga ika and mahinga mātaítai), to the extent that such food gathering is neither commercial in any way nor for pecuniary gain or trade.”

As noted earlier, if inconsistent, the Fisheries Regulations prevail over those regulations in the Fisheries Act.



FRESHWATER FISHERIES REGULATIONS 1983

The Freshwater Fisheries Regulations 1983 include provisions relating to both indigenous fish, ‘sports fish’ and ‘noxious fish’.

The regulations are enforced by Fish and Game New Zealand (‘Fish and Game’) and the Department of Conservation (‘DOC’), and they:

- Require that all recreational fishers hold a valid licence to fish for sport fish in freshwater
- Prohibit harmful practices and fishing methods for sports fish (such as the use of nets, poisons, or traps, and the setting of unattended lines)
- Restrict fishing to certain times of the year (open and closed seasons)
- Set limits for the size and quantity of a catch
- Regulate when and where fish can be released.

Schedule 1 lists the relevant sport fish, which include brown trout, rainbow trout, American brook trout or char, Atlantic salmon, Chinook salmon, sockeye salmon, perch, tench, and rudd.

Schedule 3 lists species of noxious fish, including walking catfish, European carp, Japanese koi, pike, piranha, rudd, and tilapia. Section 65 relates to the control of noxious fish.

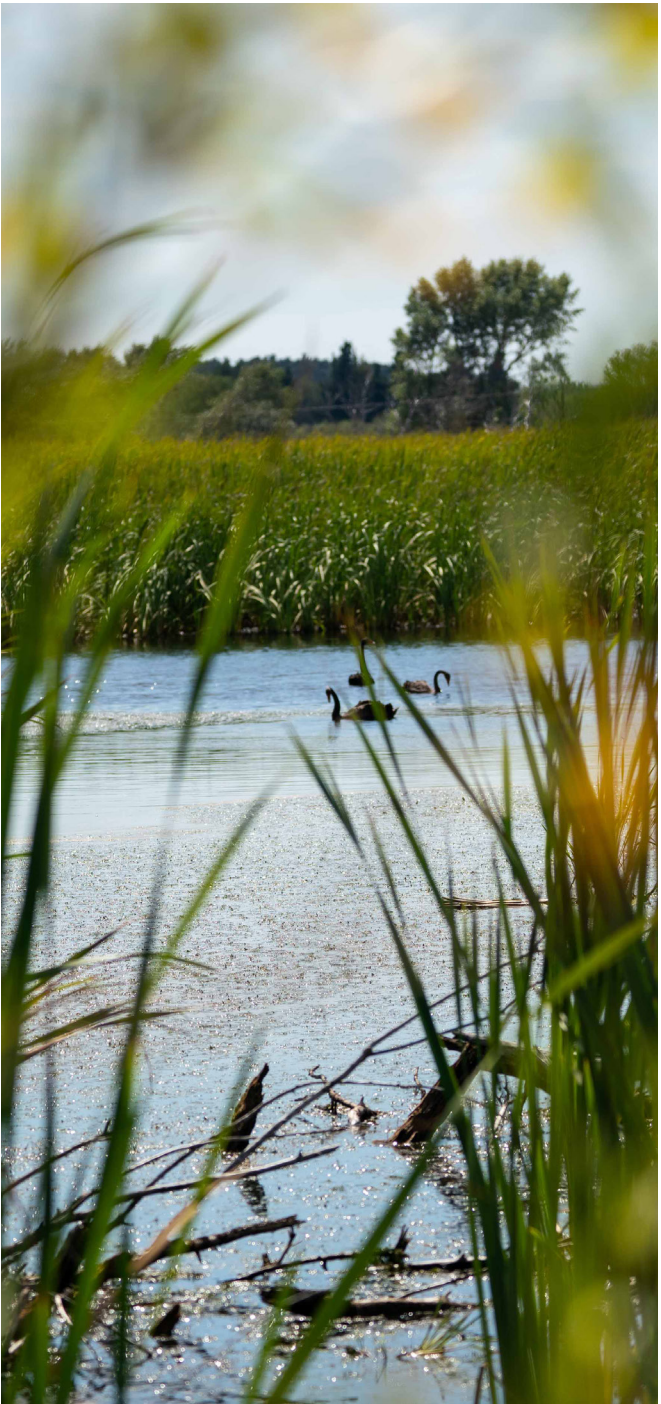
Part 6 also includes requirements and restrictions in relation to fish passage.

WHITEBAIT FISHING REGULATIONS 2021

The Whitebait Fishing Regulations 2021 outline standards for how and when people can fish for whitebait species.

For example, the regulations prohibit fishing outside the open season, prohibit fishing in closed areas, and establish permitted hours of fishing.

The regulations also include restrictions on equipment and fishing methods. They also contain provisions for customary gathering of whitebait for hui and tangi.



2.2 Te Tiriti o Waitangi

Te Tiriti o Waitangi (the Treaty) is central to resource management in Aotearoa, as it guarantees Māori protection of their lands, waters and taonga.

It enables mana whenua to exercise mana whakahaere and to manage the natural and physical resources of our rohe according to our own unique mātauranga, tikanga and kawa, and to uphold our own expression of kaitiakitanga.

The principles of Te Tiriti o Waitangi can be summarised as:

PARTNERSHIP

- The Treaty implies a partnership, exercised with utmost good faith.
- The Treaty is an agreement that can be adapted to meet new circumstances.
- The needs of both Māori and the wider community must be met, which will require compromises on both sides.
- The courtesy of early consultation.
- The principle of choice: Māori, Pākehā and bicultural options.

ACTIVE PROTECTION

- The Crown should actively protect Māori interests.
- The granting of the right of pre-emption to the Crown implies a reciprocal duty for the Crown to ensure that tangata whenua retain sufficient endowment for their foreseen needs.
- The Crown cannot evade its obligations under the Treaty by conferring authority on some other body.
- Taonga includes all valued resources and intangible cultural assets.

RANGATIRATANGA

- The Crown has an obligation to legally recognise tribal rangatiratanga.
- Tino rangatiratanga encompasses the management of resources and other taonga in accordance with Māori cultural preferences.



2.3 Statutory plans and documents

STATUTORY PLANS AND DOCUMENTS

TE TURE WHAIMANA O TE AWA O WAIKATO: VISION AND STRATEGY

Published in 2008, Te Ture Whaimana is the primary direction setting document for the Waikato River.

The vision for the Waikato Awa 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 are part of the Waikato Regional Policy Statement (‘Waikato RPS’), and therefore, planning documents under the RMA, such as regional and district plans, resource consents, and designations, must give effect to them. Plans prepared under the Conservation Act 1987, Reserves Act 1977, and Wildlife Act 1953 must also give effect to Te Ture Whaimana.

In 2010, the Waikato-Tainui River Act and the Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi River Act were passed into law. This enabled the establishment of the Waikato River Authority (‘WRA’ or ‘Authority’).



The primary purpose of the WRA is to direct the restoration and protection of the Water River through the Vision and Strategy in an integrated, holistic, and coordinated manner. The Authority also funds rehabilitation initiatives as part of its role as trustee for the Waikato River Clean-Up Trust.

Te Ture Whaimana includes objectives to realise its whāinga (vision). Appendix A outlines the key objectives of Te Ture Whaimana that informed the development of this Ngāti Tūwharetoa Upper Waikato River Fisheries Plan.

NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT 2020

The National Policy Statement for Freshwater Management 2020 (NPS-FM) outlines objectives and policies for freshwater management under the RMA. Its core principle, Te Mana o te Wai, sets a hierarchy of obligations, which prioritises:

Of particular relevance to Ngāti Tūwharetoa and this Fisheries Plan, the NPS-FM requires that tangata whenua are actively involved in freshwater management, that Māori values and mātauranga are recognised, that freshwater management takes a holistic approach, ki uta ki tai (from mountains to the sea), and that customary practices and values are provided for.

1st



The health and well-being of water bodies and freshwater ecosystems.

2nd



The health needs of people (e.g. drinking water)

3rd



The ability of people and communities to provide for their social, economic, and cultural well-being.

2.4 Fisheries management in Aotearoa

UPPER WAIKATO RIVER INTEGRATED MANAGEMENT PLAN

The purpose of an Upper Waikato River Integrated Management Plan (‘UWRIMP’) is to:

“

“Achieve an integrated approach between the Trusts that prepare the plan, relevant departments, relevant local authorities, and appropriate agencies to the management of aquatic life, habitats, and natural resources within the Waikato River consistent with the overarching purpose of this Act.”

”

The co-management legislation stipulates that the UWRIMP will comprise a fisheries component, a conservation component, and a regional council component, which is related to resource management, biosecurity, and local government functions.

The UWRIMP will be a collaborative plan between iwi, local and central government agencies that will preserve and restore Te Awa o Waikato for future generations.

FISHERIES PLANS IN UPPER WAIKATO RIVER AREA

Raukawa Fisheries Plan 2012

The Raukawa Charitable Trust prepared the Fisheries Plan on behalf of and in consultation with Ngā Uri o Raukawa.

Te Arawa River Iwi Trust Fisheries Plan 2021

Te Arawa River Iwi Trust prepared the Fisheries Plan on behalf of the three river iwi:

- Ngāti Tahu-Ngāti Whaoa
- Ngāti Kearoa-Ngāti Tuarā
- Tūhourangi-Ngāti Wāhiao.

Across the motu, numerous agencies have responsibilities, functions, and powers related to the management of freshwater fish. These various agencies, their roles, and the relevant legislation are outlined briefly here.



MINISTRY FOR PRIMARY INDUSTRIES

The Ministry for Primary Industries (MPI) has responsibilities under the Fisheries Act 1996 and the Biosecurity Act 1993.

The Fisheries Act has two primary functions, which are:

1. To determine the allocation of fisheries resources and manage the long-term sustainability of the resources.
2. To manage the effects of fishing (this can include effects on the species being fished, other species, or the wider environment and people).

All commercial fishing is managed under the Fisheries Act through the Quota Management System (‘QMS’).

Recreational fishing is also provided for through the Fisheries Act, although it remains subject to regulations that often impose limits and restrictions.

The Fisheries Act does provide for customary fishing. However, the Ngāti Tūwharetoa Fisheries Regulations prevail over regulations made under the Fisheries Act.

2.4.2 DEPARTMENT OF CONSERVATION

The Department of Conservation (DOC) is responsible for managing, protecting, and conserving freshwater fish, their habitats, and associated ecosystems. Its functions include:

- Protecting native freshwater fish
- Habitat protection and restoration
- Removal of barriers to fish passage
- Biodiversity monitoring and research
- Biosecurity and invasive species management
- Preparation of conservation strategies and plans, and
- Advocacy, education and community engagement.

The DOC enforce a range of laws relevant to freshwater fish, including the Conservation Act 1987, the RMA 1991, the Reserves Act 1977, and the Wildlife Act 1955.

The agency is also responsible for enforcing the Taupō Trout Fishery Regulations 2004.

The management of freshwater fish is the responsibility of DOC, with two exceptions:

1. MPI manage commercial fisheries, and
2. Fish and Game manage sports fisheries.



FISH AND GAME

Established under the Conservation Act 1987, Fish and Game is non-governmental organisation responsible for managing, maintaining, and enhancing sport fish and game birds and their habitats.

For the most part, Fish and Game obtain funding through the sale of hunting and fishing licenses.

There are 12 regional Fish and Game councils across Aotearoa, each responsible for managing resources in their local area. Their roles include:

- Issuing fishing and hunting licenses
- Monitoring fish and game populations
- Managing local regulations (e.g. fishing seasons and bag limits)
- Engaging with local communities, councils, and stakeholders, and
- Advocating for environmental protection at a regional level (e.g. making submissions on regional plans).

The New Zealand Fish and Game Council ('Fish and Game NZ') oversees the regional councils, providing national coordination, policy guidance, and advocacy on broader issues.

Downstream of the Huka Falls, Te Awa o Waikato falls within the jurisdiction of the Auckland/ Waikato Fish and Game Council. Upstream of the falls, the river is part of the Taupō Fishing District, and is managed by DOC.

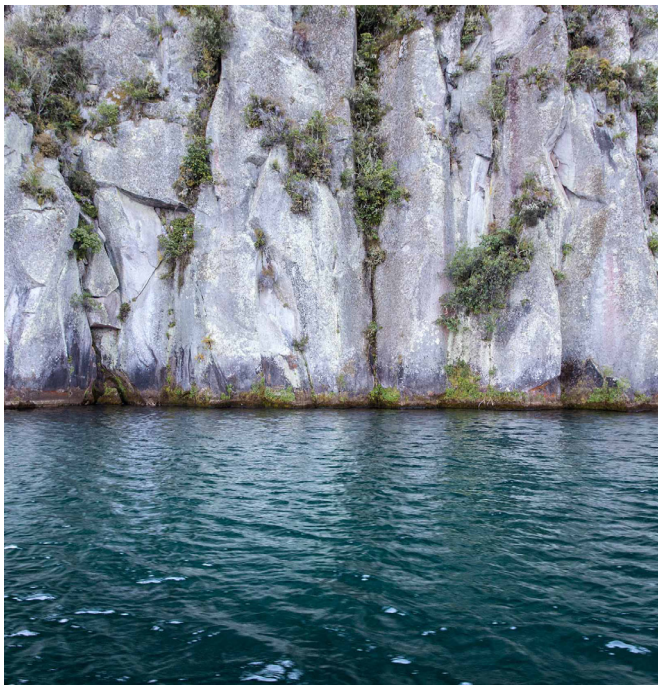


REGIONAL COUNCILS

In relation to freshwater fisheries, regional councils have functions under:

- the Biosecurity Act, and
- the RMA.

Under the Biosecurity Act, regional councils are responsible for the eradication and management of pest species and have the option to develop regional pest management plans to address these issues.



Under Section 30(1) of the RMA, functions of regional councils that are particularly relevant to freshwater fisheries include:

- establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the region’s natural and physical resources
- maintenance and enhancement of the quality of water
- maintenance and enhancement of the quantity of water
- maintenance and enhancement of ecosystems in water bodies
- the control of the taking, use, damming, and diversion of water, and the control of the quantity, level, and flow of water in any water body
- the control of discharges of contaminants into or onto land, air, or water and discharges of water into water
- establishment of rules in a regional plan to allocate the taking or use of water, heat or energy from water, or heat or energy from the material surrounding geothermal water

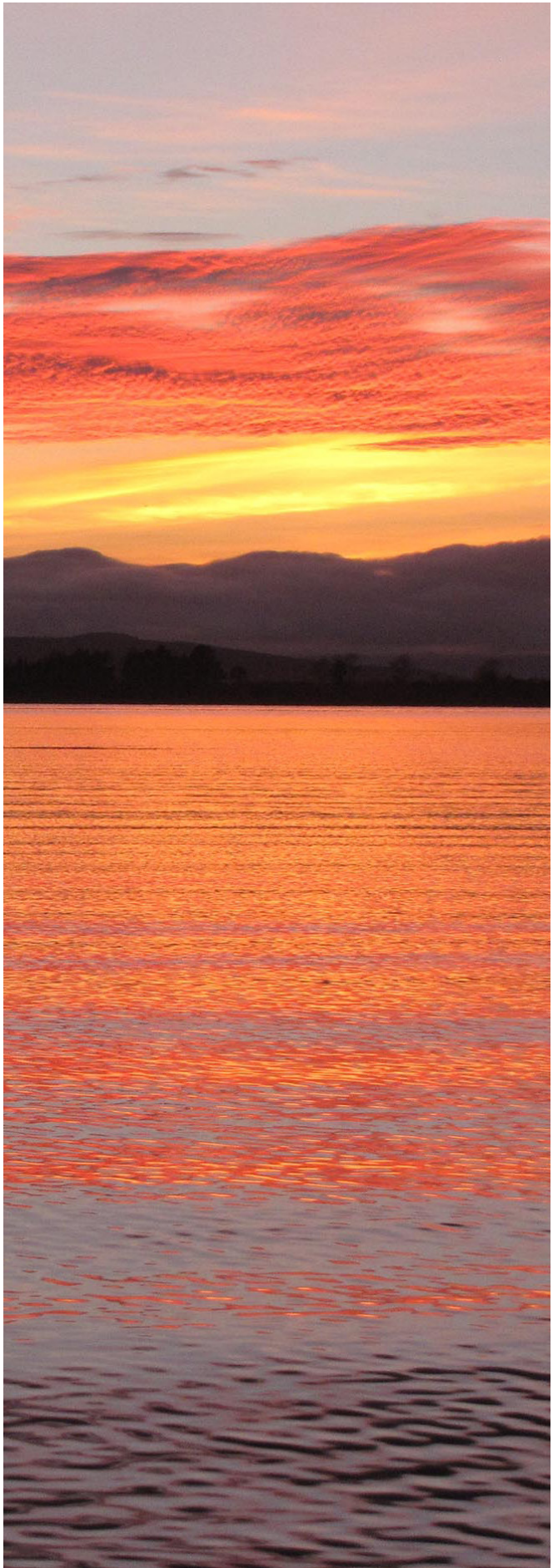
- the introduction or planting of any plant in, on, or under the bed of a water body (for the purpose of soil conservation, maintaining and enhancing water quality and quantity, or mitigating natural hazards).

The Waikato Regional Council play a significant role in the management of the Waikato Awa.

A Joint Management Agreement (‘JMA’) exists between the Regional Council and the Tūwharetoa Māori Trust Board, which sets out principles for the co-governance and co-management of the Waikato Awa and the Taupō Waters.

In relation to the Waikato Awa, the JMA outlines how the parties will work together on matters such as:

- a. Monitoring and enforcement activities (section 47 of the Upper Waikato River Act)
- b. Preparing, reviewing, changing or varying a RMA Planning Document (section 48 of the Upper Waikato River Act)
- c. Considering applications for resource consents under Part 6 of the RMA (section 49 of the Upper Waikato River Act), and
- d. Providing for processes to explore customary activities (section 45(2) of the Upper Waikato River Act.



2.5 Geographic application

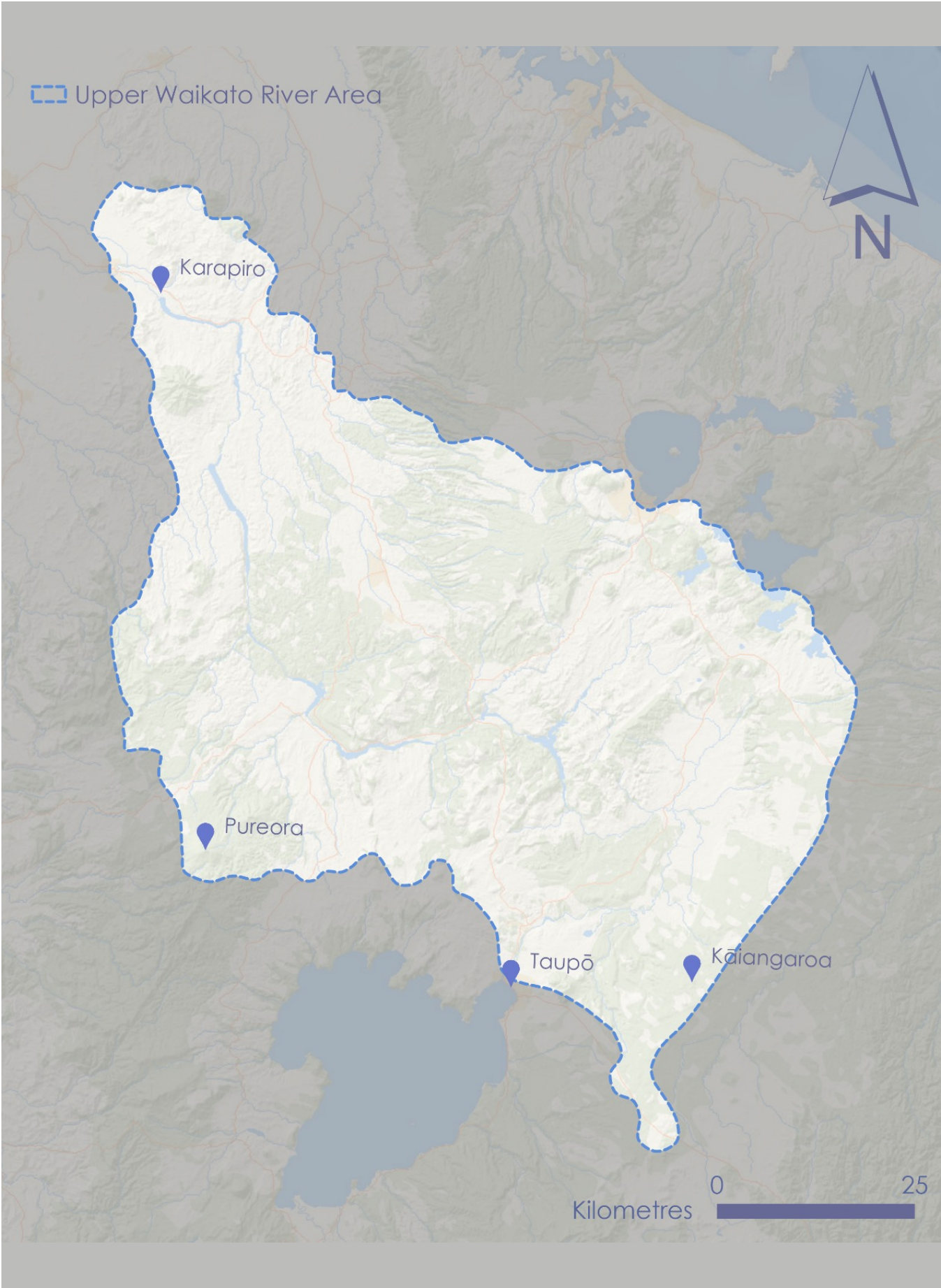
The Upper Waikato Fisheries Area stretches from the Kaingaroa Plateau in the east to the Pureora and Rangitoto ranges in the west, and from Karāpiro in the north to Taupō in the south.

It is defined in the Fisheries Regulations as the area marked “B” on SO plan 409144, and includes all tributaries, streams, and water courses flowing into the part of the Waikato River, and lakes and wetlands within the area.

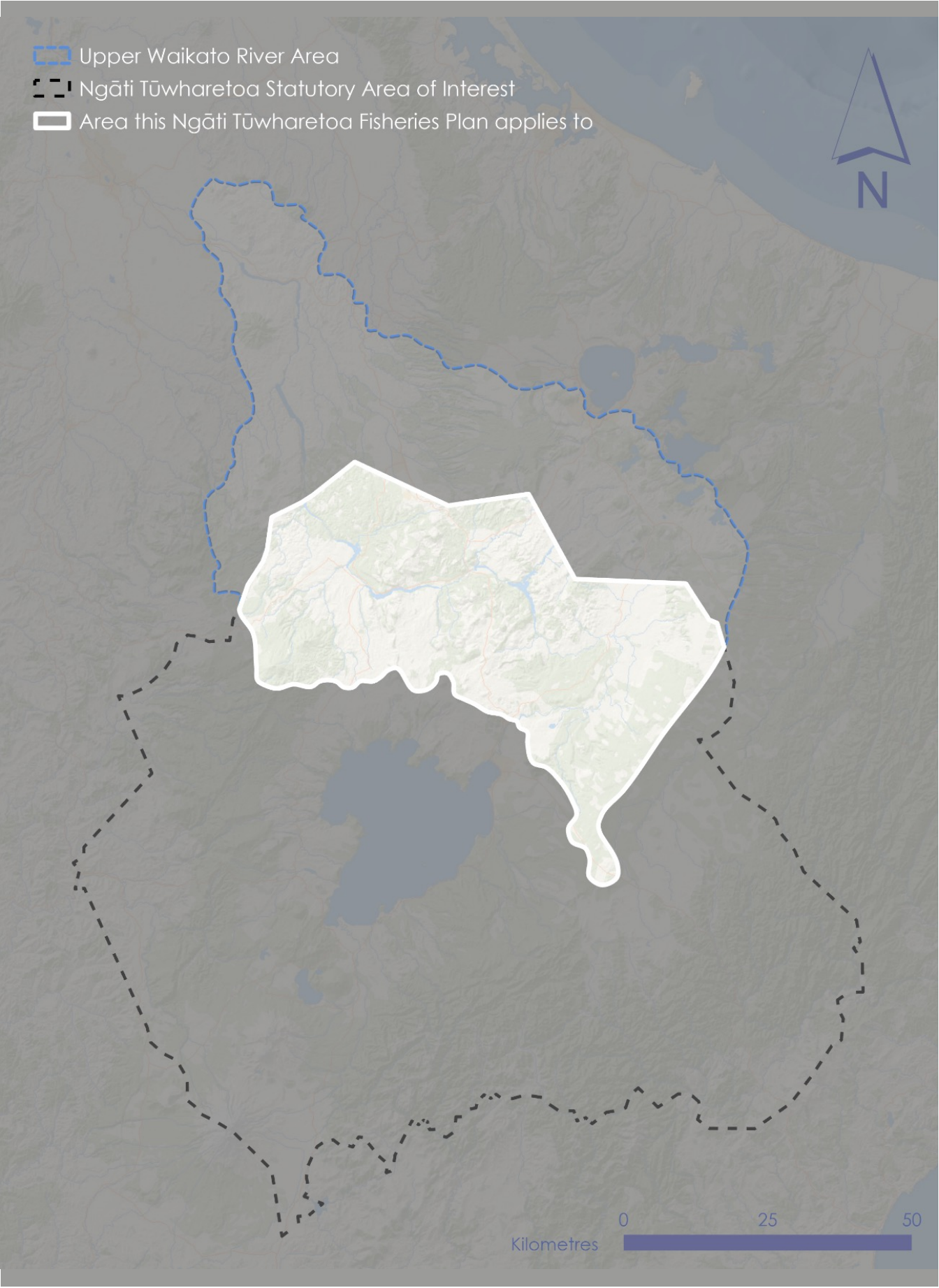
It also includes the beds and banks of the water bodies.

Fig. 4 shows the entirety of the Upper Waikato Fisheries Area, which covers around 436,000 ha.

This Fisheries Plan applies to Ngāti Tūwharetoa’s Statutory Area of Interest as it falls within the Upper Waikato River Area, as shown in Fig. 5.



4. The Upper Waikato Fisheries Area



5. Ngāti Tūwharetoa Statutory Area of Interest within the Upper Waikato River Area



3 ACKNOWLEDGEMENT

of our whanau iwi



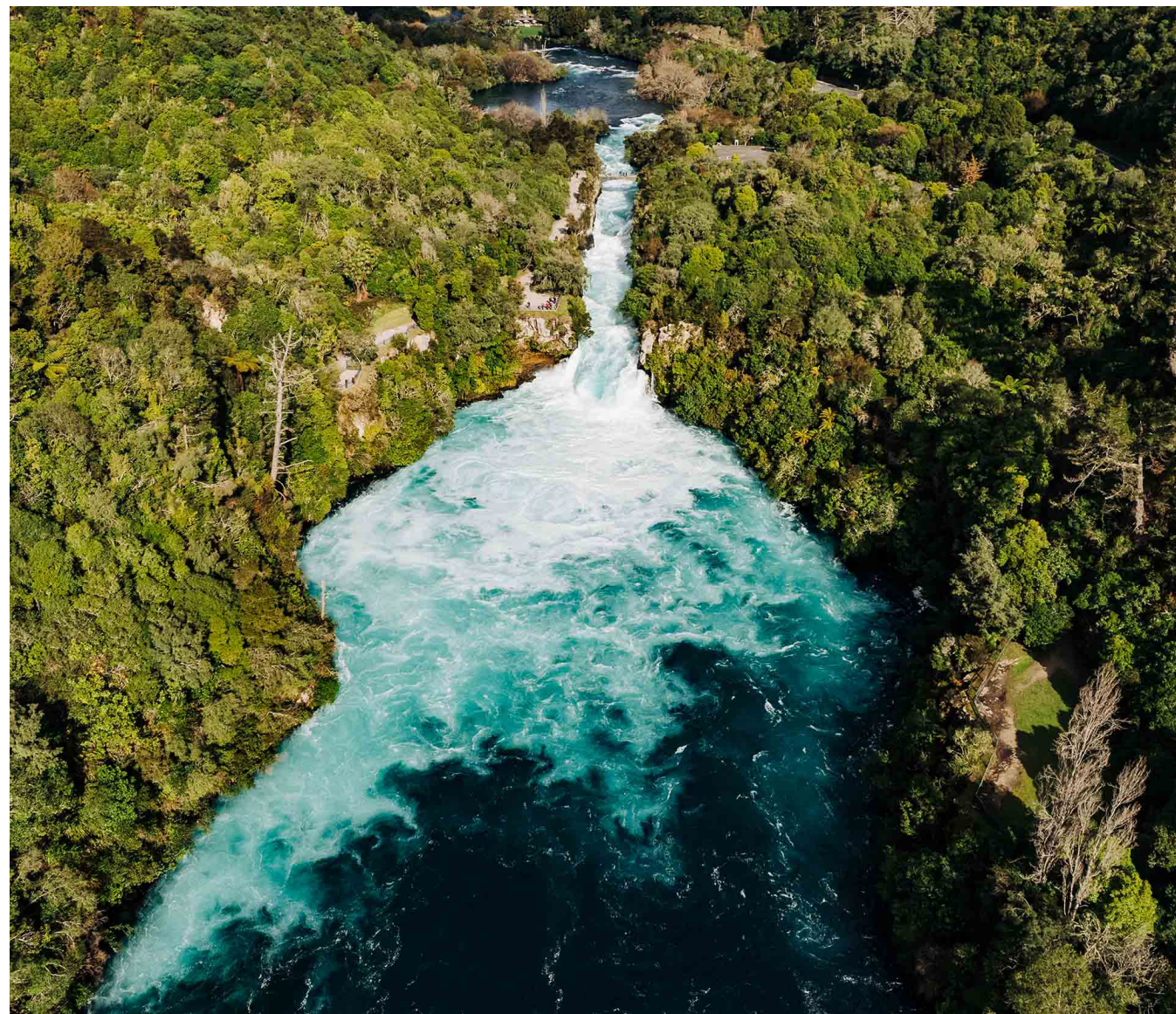
He mihi

**Ngāti Tūwharetoa acknowledge our
neighbouring Waikato River iwi:**

**Te Arawa, Ngāti Tahu / Ngāti Whaoa, Raukawa,
Ngāti Maniapoto and Waikato-Tainui,**

**who are each striving to uphold Te Ture
Whaimana and to restore and protect the
health and wellbeing of the Waikato River for
future generations.**

**We recognise that our respective rohe overlap,
but that we all have the same goals and strive
to achieve the best outcomes for our awa and
taiao together.**



4 NGĀTI TŪWHARETOA

and freshwater fisheries

4.1 Statement of significance

Named by tūpuna (ancestor) Ngātoroirangi, Te Awa o Waikato and its tributaries are significant taonga tuku iho (ancestral treasures) of Ngāti Tūwharetoa.

The awa embodies our mana and rangatiratanga.

As passed down by whakapapa, we are bound to protect and nurture the mauri of these taonga. This ancestral connection is reflected in the Trust Board's ownership of the bed of the Waikato Awa where it falls within the Ngāti Tūwharetoa rohe.

Te Awa o Waikato is a living entity that has its own mana. It moves, it breathes, gives life, it shows emotion, and we share whakapapa.

The people of Ngāti Tūwharetoa refer to the river as 'Awa Tūpuna', as it connects us to our ancestors and te ao wairua (the spiritual world), and its waters act as a conduit for our departed spirits.

Ngāti Tūwharetoa consider the river to be an indivisible whole from its source, the Waikato-iti on Maunga Ruapehu, to where it meets the sea at the pūau. Te Awa o Waikato, ki uta ki tai, is significant.

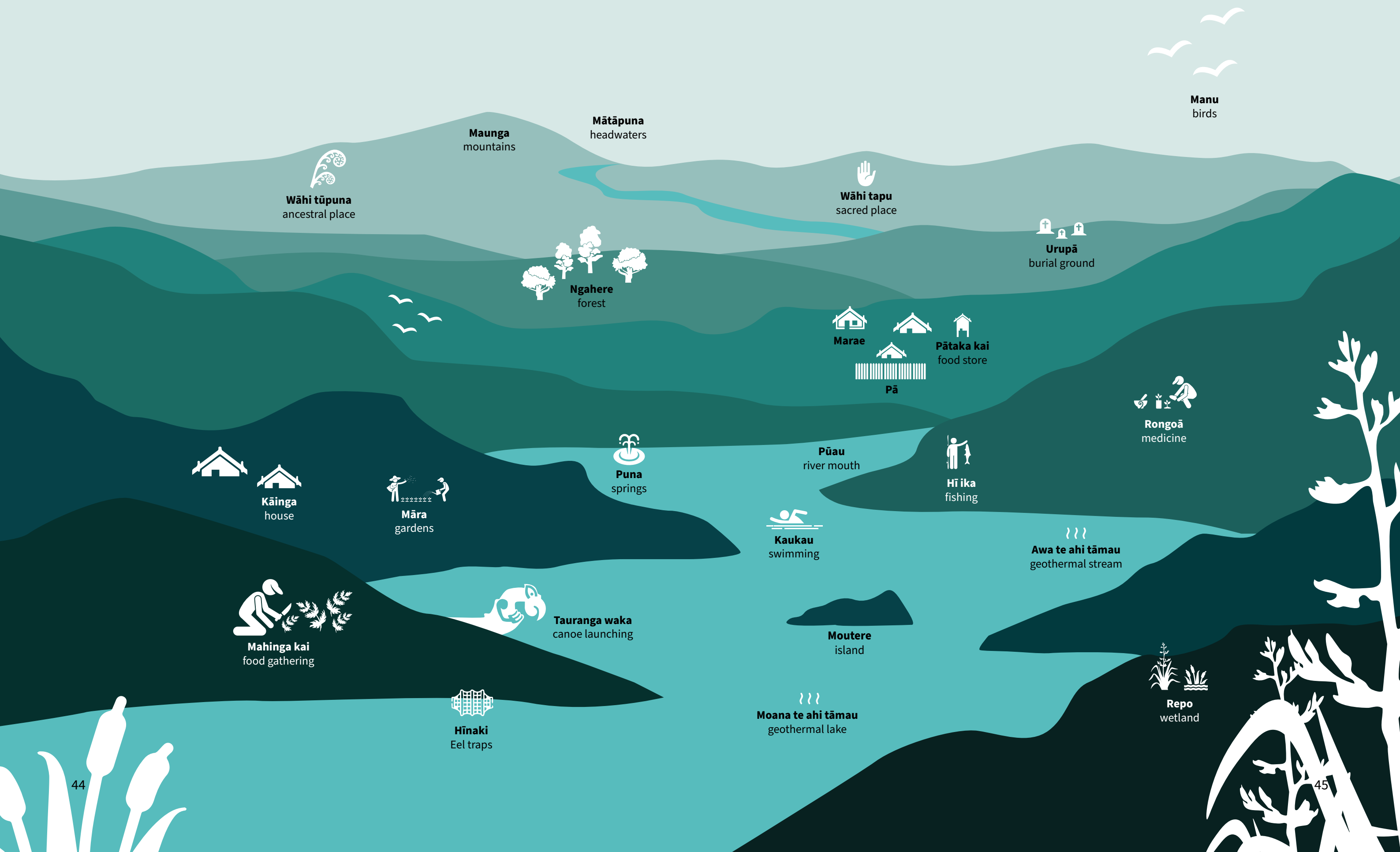
Ngāti Tūwharetoa maintain our kaitiakitanga and mana in connection with the awa throughout our rohe. The awa and its tributaries are taonga to our people, and we have a duty as kaitiaki to protect the river in its entirety through caring for the waters within our rohe.

A kōrero from Te Ture Whaimana reflects this sentiment:

“
Tooku awa koiora me oona pikonga
he kura tangihia o te maataamuri.”
*“The river of life, each curve more
beautiful than the last.”*
”



4.2 Values associated with the Waikato Awa



4.3 Wāhi tūpuna

The entirety of the Ngāti Tūwharetoa rohe is tūpuna whenua and/or wāhi tūpuna.

The relationship between our people and the land is evident through decades of settlement, historical accounts, and contemporary literature.

The following parts of the awa are considered wāhi tūpuna. These places are representative of a wider set of connections and histories.



KEY



Wāhi kaukau
(swimming or
bathing place)



**Repo
(wetland)**



Mahinga kai



**Raranga
(weaving)**



Hī ika (fishing)



Ana (cave)



River crossing



Marae



**Maunga
(mountain)**



Roto (lake)



Pūau (river mouth)



**Awa waiariki
(geothermal
stream)**



**Roto waiariki
(geothermal
lake)**



**Te Tāheke
Hukahuka
(Huka Falls)**



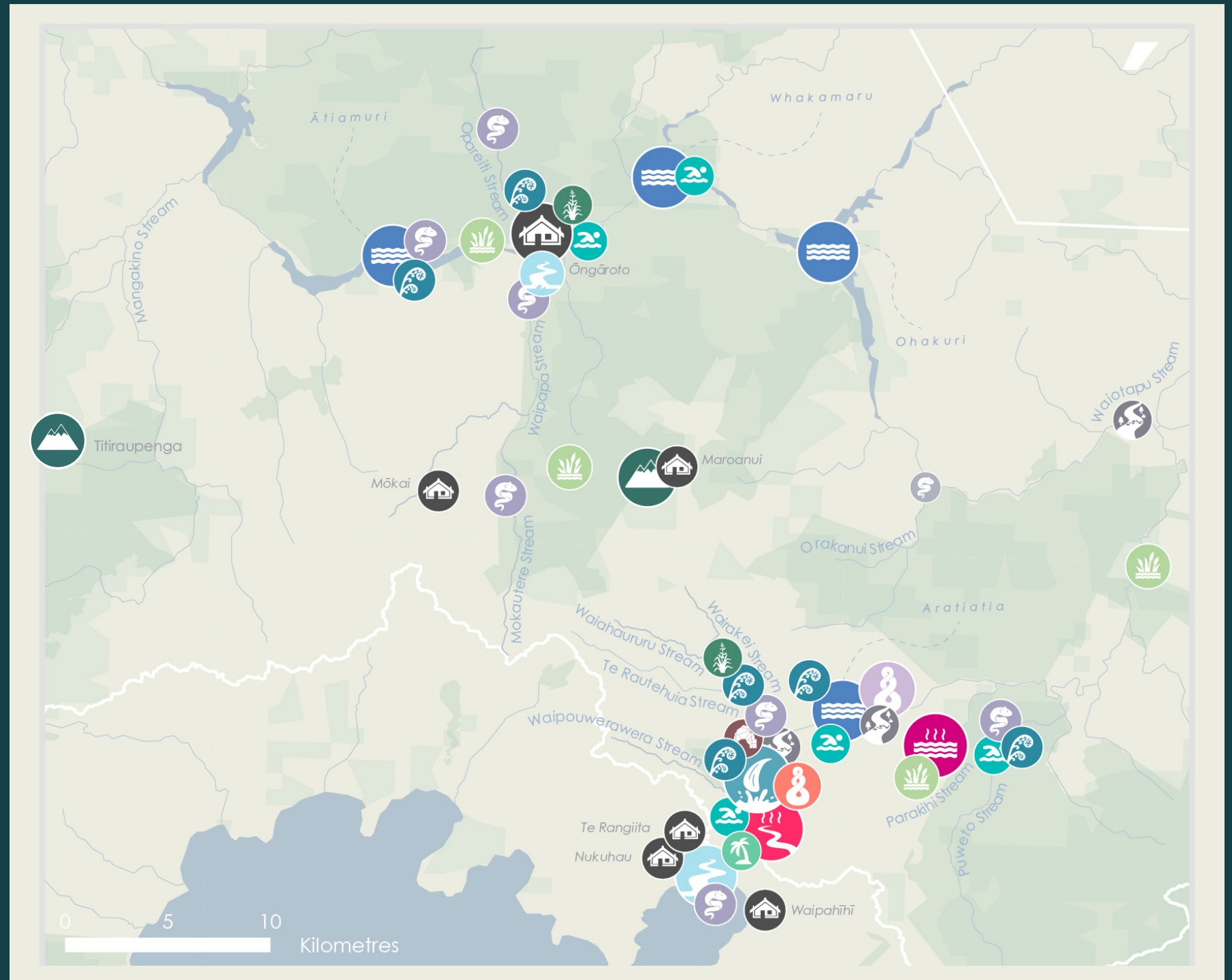
**Ngā Awa
Kōrua**



Motutāhae Island



**Te Toka-a-Tia
(the Rock of
Tia)**



6. Map of wāhi tūpuna within the Ngāti Tūwharetoa rohe and Upper Waikato Fisheries Area

WAIKATO PŪAU

“

Hei ahakoa, kei te tūwhera tonu te pūau i Nukuhau.”

“So long as the Waikato River flows from Nukuhau, so will the chieftainess of Ngāti Tūwharetoa continue to flow from the fountain.”

”

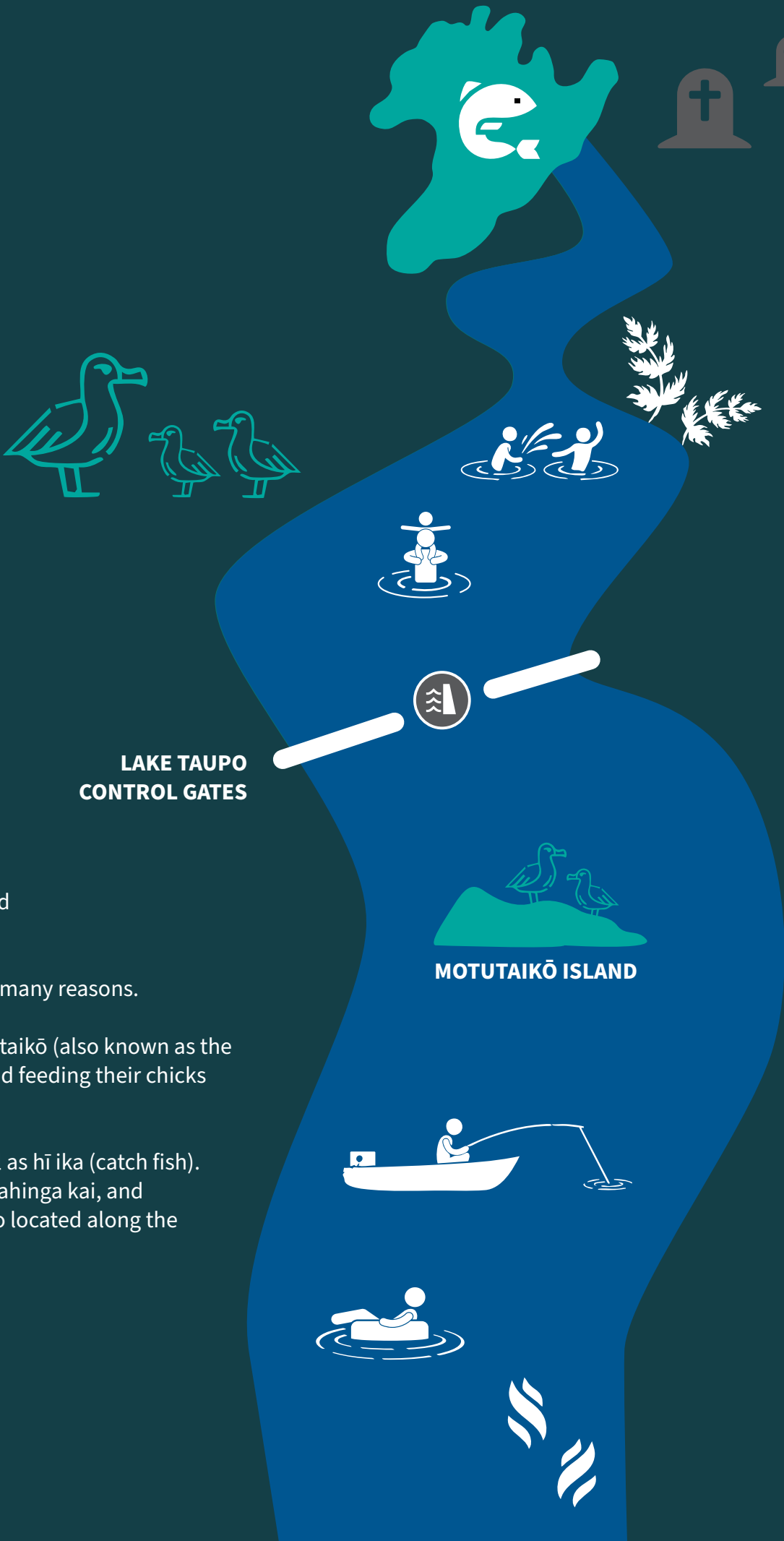
From Taupō Moana, the Waikato Awa flows ki pūau ki tai (from the river mouth to the sea).

The moana (lake) and the pūau (river mouth) are the source of the rivers mauri and are therefore incredibly important. It is an indivisible whole and can’t be isolated from its mā tāpuna (source).

The Waikato pūau is important to Ngāti Tūwharetoa for many reasons.

It was once home to an abundance of mahinga kai. The taikō (also known as the tītī) would travel from the coast and be found resting and feeding their chicks here, at the pūau, as well as on Motutaikō Island.

Mokopuna would kaukau (swim) at te awa pūau, as well as hī ika (catch fish). Along the banks of the awa, our people would gather mahinga kai, and cultivate in established māra (gardens). Urupā were also located along the banks of the pūau.



Waikato Pūau. (circa 1875-1949). Godber Albert Percy. Alexander Turnbull Library.



Legend tells how the taniwha Matawhero would reside at the pūau, as the guardian of Te Awa o Waikato.

OTUMUHEKE STREAM

Otumuheke is an awa te ahi tāmau (geothermal stream) situated in the Spa Thermal Park recreation reserve.

The awa is a spring-fed stream, comprising waters from Kathleen Stream (hot) and Tapapakuau Stream (cold).

The waiariki (hot springs) are of cultural importance to Ngāti Tūwharetoa as a wāhi kaukau (bathing spot) and as a place for mahinga kai (gathering food).

The stream is home to several rare native ferns that thrive in geothermal environments, such as ladder ferns (*Nephrolepis flexuosa*), adventive blackberry (*Rubus fruticosus*) and thermal inkberry (*Dianella nigra*).

Ladder ferns. Michael Berardozzi iNaturalist



Otumuheke Stream

TE TĀHEKE HUKAHUKA / HUKA FALLS

Te Tāheke Hukahuka, commonly known as the Huka Falls, hold great mana (prestige).

They are described as so powerful and humbling that they will take your breath away. The tumbling of wai over the rocks provides a rich source of mauri, which in turn sustains the wairua of tangata who visit.

Te Huka and the surrounding area were once home to a kāinga (village) and urupā (burial ground), and were a place used for mahinga kai (food gathering) and hī ika (fishing). Taonga tūturu (significant cultural objects) were also found here.

At the foot of the falls are two caves of great importance to Ngāti Tūwharetoa, known as Te Puupuu Caves. These caves are wāhi tapu, as they contained a urupā (burial site), and were a resting place for the kōiwi (bones) of our tūpuna (ancestors).

Approximately 200 metres downstream of the Huka Falls, on the western side of the awa and often submerged, is Te Toka-a-Tia, translating to “The Rock of Tia” (named after our eponymous ancestor, Tia).



A pūrākau tells how a man once went over the falls in his waka. It was by holding on to the rock, Te Toka-a-Tia, that he was able to survive by pulling himself to safety.



WĀHI TŪPUNA

There was once a pā on an island below Huka Falls called Te Pā o Te Waira.

ROTOKAWA

Rotokawa is a roto waiariki (geothermal lake), formed in a crater after an eruption in the Taupō Volcanic Zone. The lake contains lots of small craters, and these are actively erupting due to the ongoing hydrothermal activity.

The lake and surrounding wetland are home to unique aquatic and terrestrial habitats, influenced by the environment, in particular fumaroles (vents releasing volcanic gas), heated ground and geothermal stream margins.

Characterised by large deposits of sulphur beneath and surrounding the lake, Rotokawa is known as a sulphur lake, and was used by whānau for healing purposes. People would bathe in the lake to heal hakihaki (a rash on the skin) and to assist recovery.

Rotokawa Moana was traditionally used by toa (warriors) on their return from pakanga (battle).

WAIKĀKEI STREAM

Known for its abundance of geothermal resources, hapū and whānau would travel to Wairākei, often establishing temporary encampments. Kōkōwai (also known as 'red ochre') was collected here, a material used as paint or dye, and commonly used in ceremonial exchanges of goods and gifts. Tangata whenua would dig for Aruhe (fern roots), collect harakeke and raupō for raranga (weaving) and set nets to catch kōkopu (native trout) and kōura (crayfish).

NGAAWAPURUA RAPIDS

Around 1 km downstream of Te Tāheke Hukahuka, the Ngaawapurua Rapids could once be found. Here, people would make the most of the shallow water, and stepping stones were used to cross the river. This became a popular river crossing for Ngāti Tūwharetoa.

WĀHI TŪPUNA

ARATIATIA MOANA

Before the construction of the dam, whānau would kaukau (swim) below Aratiatia.

Kākahi (freshwater mussels) were present and would be collected below the lake, and later on, the roto (lake) became a place where many people would catch morihana (goldfish).

Aratiatia Dam



Lake Aratiatia

WĀHI TŪPUNA

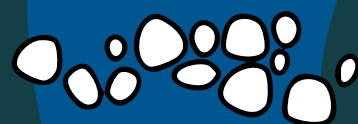
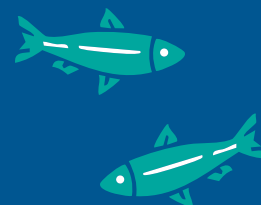


PŪWETO AWA

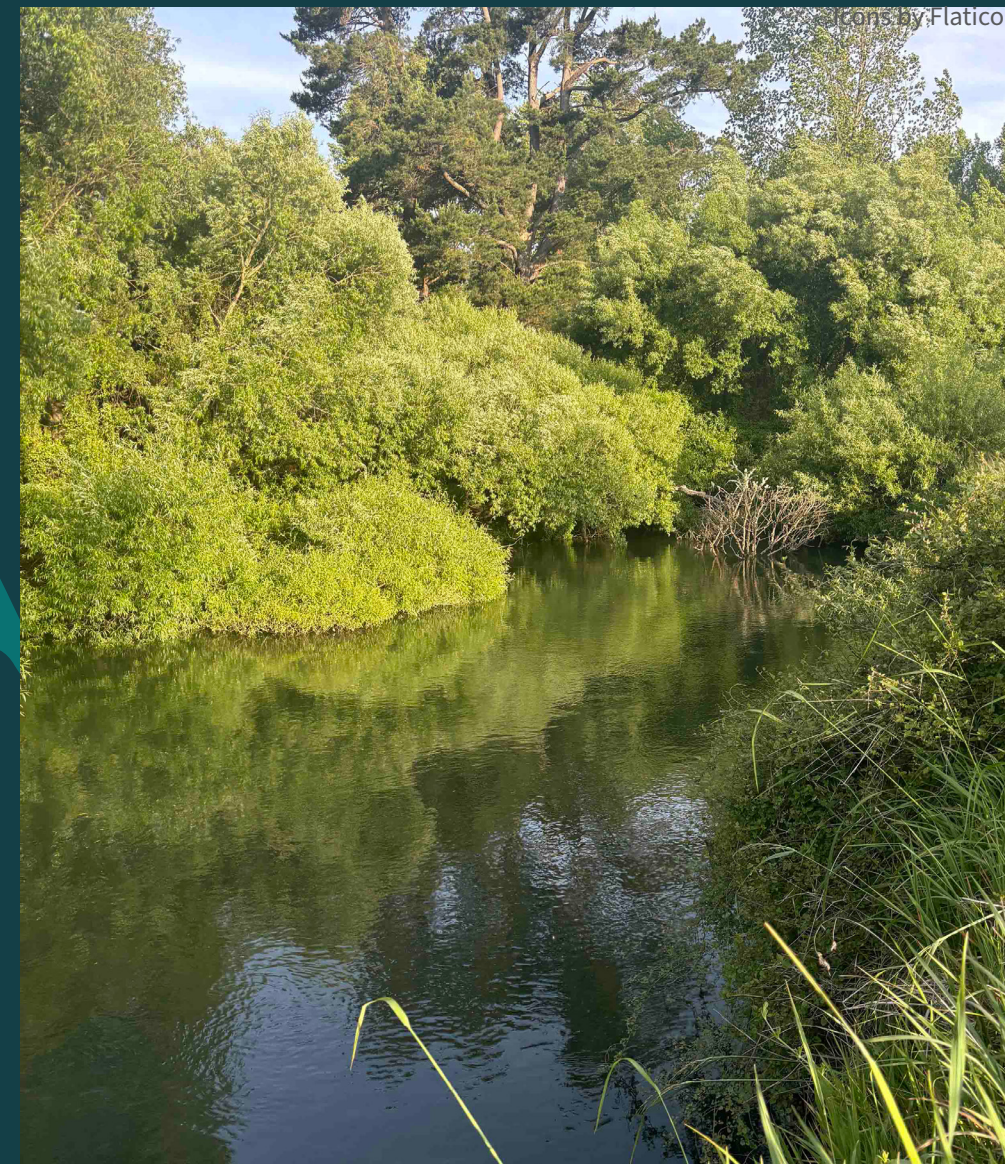
The Pūweto is a tributary of the Waikato River, with its mā tāpuna (headwaters) located on the eastern side of the Tauhara maunga, between Opepe and Pukuriri.

The awa is recognised as an ancestral pathway for Ngāti Tūwharetoa, and was used as a key transport corridor and navigational route that connected hapū and whānau from along the Waikato Awa, with those in the Opepe kāinga (village).

There are many wāhi kaukau (swimming spots) along the Pūweto Awa. The stream was renowned for its abundant tuna (eel) supply and was a popular spot for hī ika (fishing) and mahinga kai (food gathering).



Pūweto, the manu in which the awa is named after



Pūweto Awa



The name of the awa originates from the red-eyed ancestor, Pūweto, a manu (bird) who was present during the great battle between Te Au-o-Rangitaiki and Te Au-o-Waikato, which took place near the ocean.

WĀHI TŪPUNA

WHAKAMARU MOANA

Many species that are taonga to Ngāti Tuwharetoa have been found in Lake Whakamaru, such as ngaore (common smelt), toitoi (common bully), as well as kōura (freshwater crayfish). Kākahi (freshwater mussel) are a valuable source of kai for Ngāti Tūwharetoa and there is kōrero on how they were commonly collected from Whakamaru Moana.

The roto (lake) was also a popular spot for harvesting watercress.

A population of long-tailed bats that are taonga to Ngāti Tūwharetoa are known to reside near the roto. This species is unique to the area, and is threatened, with a conservation status of Nationally Critical.

Whakamaru is also a wāhi kaukau (swimming and bathing place) for our whānau.

MOKAUTERE STREAM

Mokautere Stream, near Mōkai, flows into the Waipapa Stream, before reaching Te Awa o Waikato. It was once a wahi hī ika (fishing spot) where tuna were plentiful. The stream was also known for gathering kōura.

WAIPAPA STREAM

The Waipapa Stream enters the Waikato Awa near Ōngāroto, upstream of Lake Whakamaru. The stream contains, and is surrounded by, a number of geothermal springs, which heat tributaries flowing into the stream, and at one point along the awa, form a small, heated pool.

A rare species of fern (*Christella dentata*) can be found along the Waipapa, and parts of the awa are considered nationally significant due to the presence of this unique geothermal habitat.

The pūau (river mouth) of the Waipapa was a popular hī ika (fishing) and mahinga kai (food gathering) site for Ngāti Tūwharetoa. It was known as ngā tuna hīnaki, where baskets were used to trap tuna and īnanga, providing a source of kai.

Natives such as kōura and kākahi, as well as introduced species, rainbow and brown trout, are collected from the Waipapa Stream to be used as kai for our whānau.



OPAREITI STREAM

Kōura was collected from the Opareiti Stream, a common source of kai at the Ōngāroto Marae.



ŌNGĀROTO PĀ

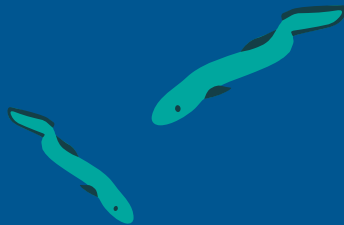
Located near the banks of the Opareiti Stream, is the Ōngāroto Marae and Pā.

The area surrounding Ōngāroto was known for its large plantations of harakeke (flax), which was used for raranga (weaving).

Taewa (potatoes) were cultivated around the marae in māra (gardens) and provided a valuable source of kai.

Urupā (burial grounds) are situated along the banks of the Waikato Awa near Ōngāroto.

A repo (wetland) is found downstream of the marae, home to important indigenous habitat.



View of Mt Pohaturoa, Atiamuri. (circa 1880s). Gifted by Mr McCormack. Collection of Hawke's Bay Museums Trust, Ruawharo Tā-ū-rangi, 1171.

ĀTIAMURI MOANA

Ātiamuri is a man-made lake, formed as a result of the Atiamuri Dam, which was constructed in 1953.

Before this, the Waikato Awa flowed past the Ātiamuri kāinga (village) and the wide, meandering river was a popular spot for swimming.



4.4 Traditional methods for collecting kai

TAU KŌURA

Tau kōura are bundles of bracken fern tied together and placed into the water to catch kōura (and sometimes other small fish).

The bundles, called whakaweku, are left in place for a week or more at a time, and the kōura crawl onto the bundles, as they provide excellent habitat and hiding places.

The bundles are retrieved and the kōura are shaken out onto a net, called a kōrapa.

Whakaweku used for tau koura. Ian Kusabs. NIWA.



Koura being collected from the water in a fern bundle known as tau koura. (circa 1921). Unknown.

TRADITIONAL METHODS FOR COLLECTING KAI

HĪNAKI

Hīnaki are an extremely effective method for catching tuna. They have a wide entrance that tapers down to a small outlet. Hīnaki are easy for fish to get into, but hard to escape.

Traditional nets are often made from kareao, commonly known as supplejack, a woody plant with strong but flexible stems.

Hīnaki are baited and set overnight to catch tuna that live in streams, wetlands, and lakes. Tuna heke, or eels migrating out to breed, do not feed. For tuna heke, the hīnaki are left unbaited and attached to pā tuna (see below).

For smaller fish, such as galaxiid species, smaller hīnaki were made from a strong reed that grew in dry areas, often among mānuka.

The modern hīnaki is typically made from wire rings and nylon mesh, allowing it to be folded up and transported more easily.



Hīnaki used for catching tuna. (circa 1890-1930). Samuel Head.



A hīnaki and pā set on the Tongariro River. Unknown. Alexander Turnbull Library, Wellington.

PĀ AND UTU

Pā and utu, often known as weirs, are structures built across parts of a river or stream.

They work by blocking the path of the fish and directing them into a hīnaki.

Tuna, piharau, and sometimes smaller fish such as whitebait were key species harvested in pā and utu.

For piharau, the structures worked by blocking upward migrating lamprey and letting the current wash them back downstream into a waiting hīnaki.

For tuna, the pā would funnel tuna migrating downstream into the waiting hīnaki.

For whitebait, the pā would block their upstream migration, and there would be a hīnaki attached to a gap in the pā on the upstream side. The whitebait, trying to make their way upstream, would swim into the hīnaki.

Pā tuna set on the Whanganui River. (1921). James McDonald. Te Papa.



BOBBING

‘Bobbing’ is a method used to catch tuna, which involves the use of a native worm species that glows in the dark when injured. Once the worms have been collected from the bush, they are threaded onto a piece of muka, the fibre of harakeke (flax). A loop is formed, which is attached to a long pole, and the muka and worm are placed into the water.

When the tuna bites down on the worm, the pole is pulled out quickly, and the tuna is flung over the shoulder and onto the bank.

Our people used this method to catch kōkopu (a large galaxiid) in rivers around the rohe.

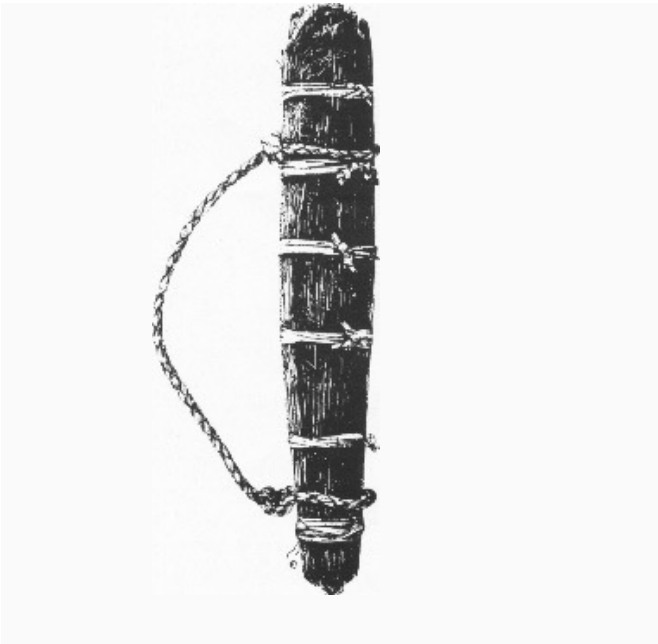
RAMA

Tuna and kōura were often caught using a rama, or torch. Both tuna and kōura are more active at night, so rama tuna and rama kōura were effective methods for catching them. In the past, the rama was made from flammable material such as the heartwood of kahikatea; nowadays, electric torches are used.

Rama are used with either a hand-net or a spear. Modern spears are usually made with shop-bought metal spearheads, but traditional spears were made from wood and usually had multiple points to them. Kōura can also be collected without a net, just by picking them up by hand.



Muka from harakeke. Unknown. Te Papa.



Drawing of a traditional Māori rama. Unknown. Te Papa.

RAPU

To ‘rapu’ is to search for something. Rapu, as a harvesting method, refers to searching for the kai, either by touch or by sight.

Kākahi were found either by feeling with hands and feet among the sediment, or, in clear water, by visually searching for the top part of the shell or the two siphons protruding from the streambed.

Kākahi are very slow-moving, so they were easily harvested in previous times, when they were more abundant.

Nowadays, numbers are low, and kākahi are few and far between.

Kōura were found by looking under rocks and stones, and feeling between cracks and under banks.

GAFFING, LINES AND NETS

A gaff is a pole with a sharp hook on the end. These are used to catch eels.

Fishing lines are sometimes used as another method for catching eels. Scoop nets were also used to catch small fish, such as galaxiids.



Matarau used for catching tuna. Basil Keane. ‘Te hopu tuna – eeling - Torches, nets and spears’, Te Ara - the Encyclopedia of NZ.

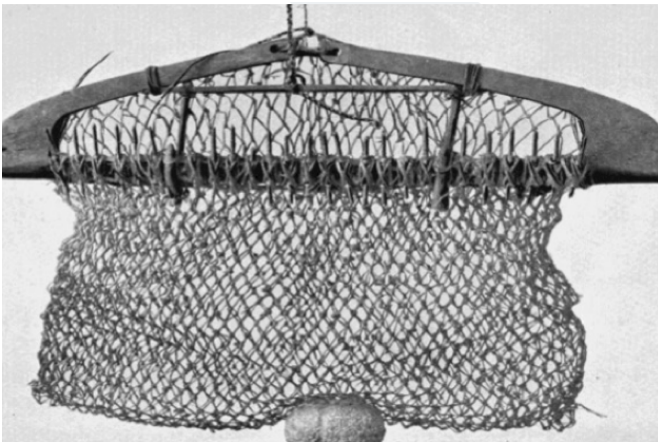


A traditional māori hook. Unknown. New Zealand National Geographic.

ROU KĀKAHI / ROU KŌURA

In deep water in Taupō Moana, kākahi were harvested using a rou kākahi (sometimes called a rau). These were nets with a flat edge that were designed to scrape along the lake bed to dredge for kākahi.

Similarly, in the lake kōura were caught using a rou kōura – a large net with a D-shaped mouth.



Rau kōura. Paul Meredith. ‘Te hī ika – Māori fishing - Tools, grounds and methods’. Te Ara - the Encyclopedia of New Zealand.



4.5 Traditional management tools

Rāhui

Rāhui is a form of restricting access, which is used to safeguard both the physical and spiritual wellbeing of people, kai and taonga.

Take tuku

Take tuku is the claim to land by virtue of a gift or grant. Access to birding sites, fishing grounds, or resources such as kōkōwai (red ochre) are examples of take tuku, and they were given as a peace offering at a marriage ceremony.

Take Tuku were also given during other peace making or ceremonial occasions.

Take ingoa

Through whakapapa (ancestry) and mātauranga (knowledge), everything in Te Ao Māori had a name and a function. This was a critical aspect of te ao tawhito (the old world) and traditional education.

In the 1800s, our tūpuna knew their rohe intimately, because it was their tūrangawaewae (home or 'place to stand'). Hapū would pride themselves on knowing the names of every mountain, hill, valley, plain and river, down to the smallest stream.

Each of these natural features deriving its name from an associated characteristic or historical feature. Trees, plants, birds and insects were aptly named to describe their appearance, habits or the relationship with our people and the environment.

Whakamoemoe

Occasionally, we could expect challenges from other hapū for access rights, particularly if the land contained valuable resources like kōkōwai (red ochre from clay) or pūngao puia (geothermal energy).

In order to keep their mana intact and be considered kaitiaki worthy of the land, defending hapū would often restore peace through whakamoemoe (marriage). A strategic marriage would be between a high ranking tūpuna, and the alliance would have benefited both rōpū (groups).



A sign at Te Tāheke Hukahuka (Huka Falls) advising the public of a rāhui



5 SPECIES

in the Upper Waikato Fisheries Area

5.1 Who is living here?

It is challenging to determine conclusively which species are present in the Upper Waikato Fisheries Area. Some species are known to be here from iwi kōrero, but have no recorded sightings.

Some species were present in the past, but may no longer be present due to physical barriers or other factors. Some Māori names are used for multiple species, making it challenging to

determine which species is being referred to. For example, īnanga can be either *Galaxias maculatus*, or the young of other galaxiid species.

For this plan, we have chosen to include any species for which there is either a recorded sighting or iwi kōrero. We have also included species that were historically known to be present, even if they may no longer be present.


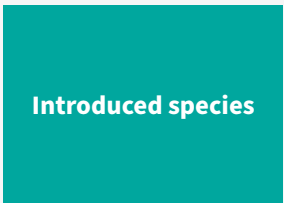
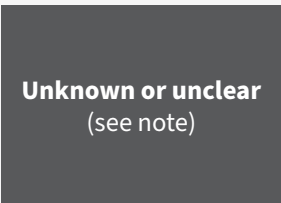

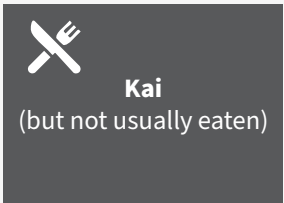



Table 1: The status of the species found in the Upper Waikato Fisheries Area*

*With the exception of piharau.

The locations of the recorded species are shown in Figs. 7 and 8. The species are a mixture that are:

- native to the area
- native to Aotearoa, but introduced to this area
- introduced to Aotearoa, but still considered a valuable kai species, or
- introduced pests.

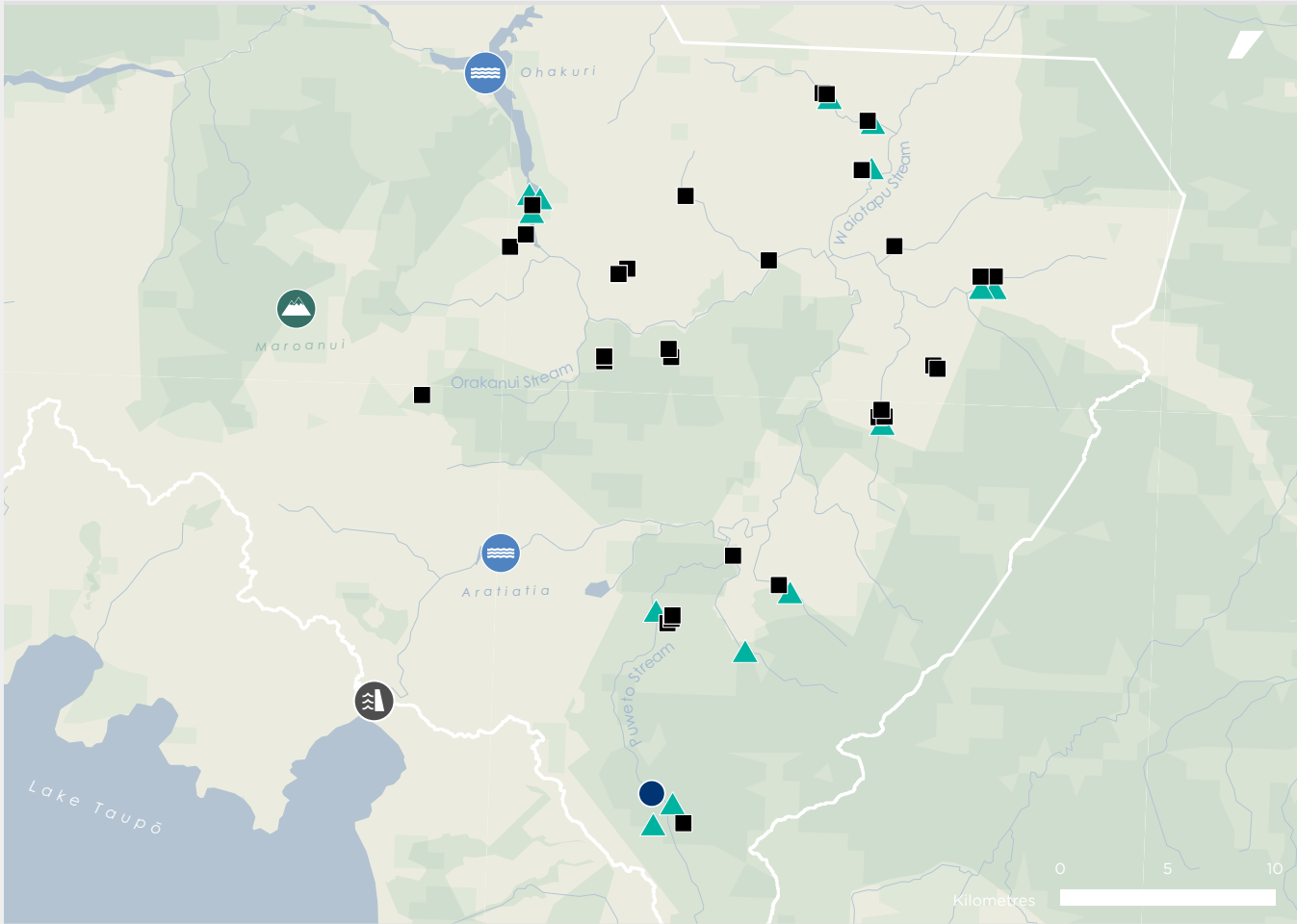
KEY		Origin		
				
		Native to the area	Introduced species	Unknown or unclear (see note)
		Kai / Pest		
				
		Kai for Ngāti Tūwharetoa	Kai (but not usually eaten)	Pest

NOTES

1. To some, trout is considered a pest. Others value it for kai.
2. Unknown – unclear whether the ngaore found here originated from the population introduced to Taupō Moana or are a remnant natural population from prior to the hydro dams being built. Typically, native to Aotearoa.
3. Unclear – may be a name for a life stage of kōaro. Typically, native to Aotearoa.
4. Native to Aotearoa generally. May have been present in this area.
5. Unclear – may be a name for a life stage of kōaro. Typically, native to Aotearoa.

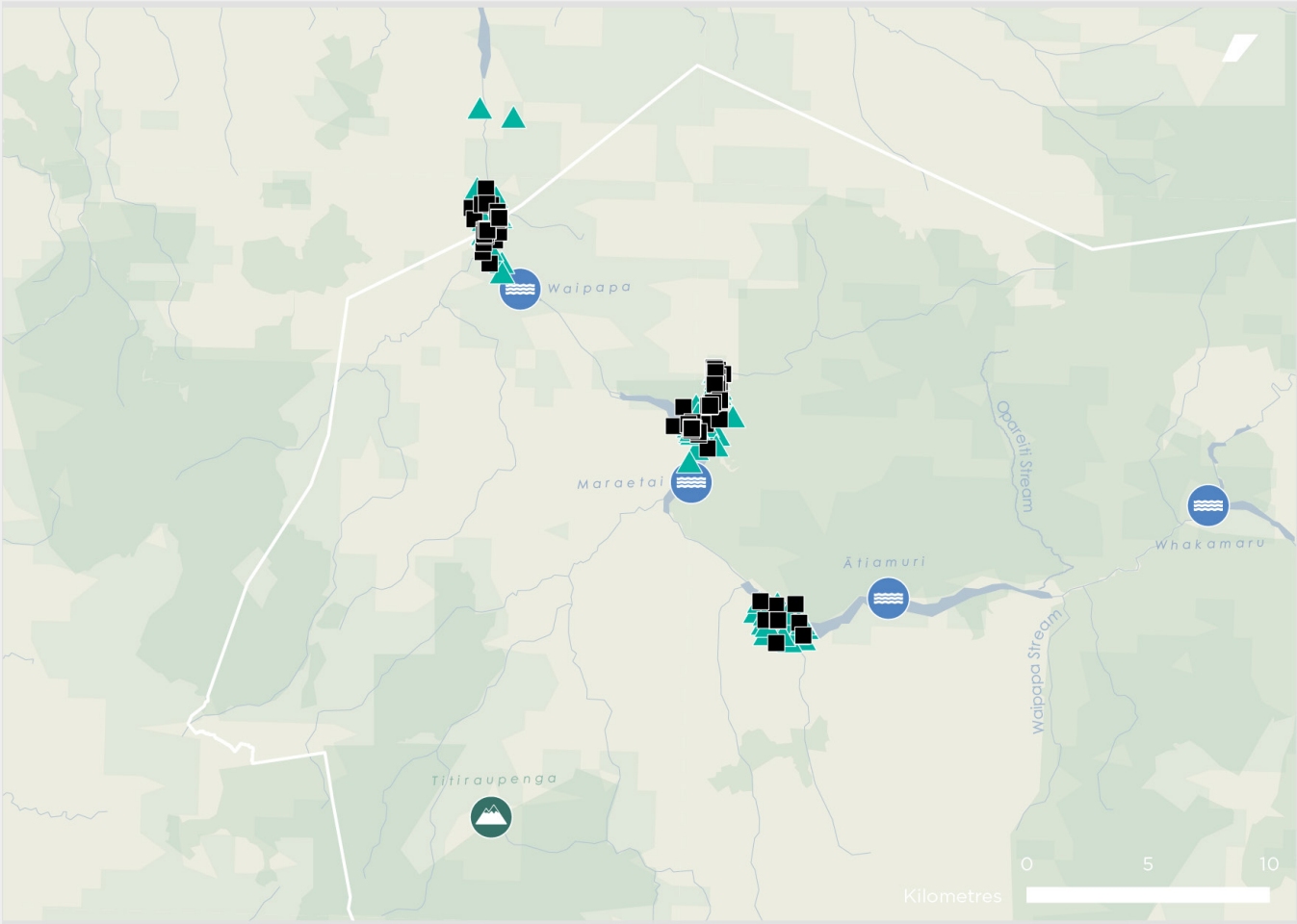
 Tuna	 Toitoi	 Kākahi	 Rudd
 Brown bull-headed catfish	 Kōura	 Kokopu	 Trout ¹
 Ngaore ²	 Īnanga ³	 Goldfish	 Gambusia
 Guppy	 Kōaro	 Piharau ⁴	 Banded Kokopu ⁵

THE LOCATION OF RECORDED SPECIES - EASTERN EXTENT




7. Species recorded in the Upper Waikato River Area (**eastern** extent of Tūwharetoa rohe)

THE LOCATION OF RECORDED SPECIES - WESTERN EXTENT




8. Species recorded in the Upper Waikato River Area (**western** extent of Tūwharetoa rohe)


KEY




Roto
(lake)



Maunga
(mountain)



Lake Taupo
Control Gates



Upper Waikato River within Ngāti Tūwharetoa
Statutory Area of Interest

Native

Introduced

Pest

5.2 Kōura

Conservation status:
Not Threatened

Kōura (*Paranephrops planifrons*) are a small, native, freshwater crayfish, that live in lakes, rivers, and wetlands across Te Ika-a-Māui and north eastern Te Waka-o-Māui.

Their South Island relation, *Paranephrops zealandicus*, lives only in Te Waka-o-Māui.



Kōura seek shelter between rocks and amongst woody debris, underneath undercut banks, and by burrowing into the mud. In lakes, they tend to feed in the near-shore zone where food is more concentrated, but kōura can be found at depths of up to 60 metres.

Kōura are considered a ‘keystone’ species (influential and ecologically important) in freshwater ecosystems. They have many ecological functions, such as breaking down leaf litter and woody debris, cleaning up after aquatic animals, and hunting (and influencing the behaviour of) aquatic insects.

In the Taupō Fishing District, which includes Lake Taupō and the Waikato River until the Huka Falls, Ngāti Tūwharetoa hold exclusive rights to kōura harvest.

Kōura is deeply important to us as Ngāti Tūwharetoa. It was one of our primary food sources in times past, and is a treasured kai for us today.

Kōura. William Brockelsby.
iNaturalist



Kōura. Shaun Lee. iNaturalist

5.3 Kōaro

Conservation status:
At Risk – Declining

Kōaro (*Galaxias brevipinnis*) is one of five migrating species of Galaxiids found in Aotearoa.

They have a narrow, tube-shaped body and a beautiful camouflage pattern that is sometimes shimmering with golden flecks.

Kōaro juveniles – or whitebait – were a significant food source for Ngāti Tūwharetoa before the introduction of trout to Taupō Moana.

Kōaro are most commonly found in the upper reaches of stony-bottomed streams, including small headwater streams and tributaries.

Juveniles are excellent climbers and can navigate large natural barriers, such as waterfalls and rapids. Kōaro spawn in gravel and leaf litter at the sides of streams when flows are high, and



Kōaro. Saryu Mae. iNaturalist
sometimes underneath boulders in riffles.

They were incredibly important to Ngāti Tūwharetoa, and stocks in Taupō Moana were a significant food source for our iwi. After trout and smelt were introduced to Taupō Moana, kōaro are now very rare in the lake. We do not have any information on how they are faring in the Upper Waikato Fisheries region.

Kōaro. Morris. iNaturalist



Kōaro. Michael Berardozzi. iNaturalist

5.4 Kākahi

Conservation status:

- *Echyridella menziesii* | **At Risk – Declining**
- *Echyridella aucklandia* | **Threatened – Nationally vulnerable**

Kākahi are a native freshwater mussel found across Aotearoa. There are three kākahi species in Aotearoa:

1. *Echyridella menziesii*,
2. *E. onekaka*, and
3. *E. aucklandica*.



Kākahi. greenmountainparrot. iNaturalist

Although we don't have any specific records, we are likely to have *Echyridella menziesii* in the Upper Waikato Fisheries Area, as they are found both upstream and downstream of the area.

Echyridella aucklandica may also be present, as they are recorded downstream of the area. However, this species is rarer than *E. menziesii* and may not be found in this area.

Kākahi. M Rutherford. iNaturalist

KĀKAHI

Kākahi. Jenny Saito.
iNaturalist



Kākahi were a prized kai for Ngāti Tūwharetoa.

They were particularly abundant in Taupō Moana. The flesh was threaded onto harakeke strings to dry in the sun. These dried, threaded kākahi were easy to transport.

Kākahi are long-lived. *Echyridella menziesii* lives for an average of 12-30 years, but can live as long as 50-60 years.



Unlike marine mussels that attach themselves to rocks or wood, kākahi live in the beds of rivers, streams and lakes. They use their thick white foot to move around, anchor themselves and burrow into the sediment.

Kākahi eat algae, zooplankton, and other microorganisms that drift in the water.

The larvae of kākahi are parasites that require a host fish to transform from larvae to juveniles. The larvae latch onto the fish, often on the gills or fins, and stay there for a few weeks before dropping off.

Echyridella menziesii can use several different fish as a host, but *E. aucklandica* only uses smelt.

Kākahi juveniles need clean water and a bed that is not too silty and doesn't clog their gills.

Kākahi. Jacqui Geux. iNaturalist



5.5 Tuna

Conservation status:

- *Anguilla dieffenbachii* | **At Risk – Declining**
- *Anguilla australis* | **Not Threatened**

There are two tuna species native to Aotearoa:

1. the longfin tuna (*Anguilla dieffenbachii*) and,
2. the shortfin tuna (*Anguilla australis*).

The Australian longfin eel (*Anguilla reinhardtii*) can be found in Aotearoa, but isn't very common and is currently considered a 'visitor'.

The longfin species is endemic to Aotearoa (only found here) and is our biggest tuna. Females can grow up to 2 metres in length and 25 kg in weight. When their bodies are bent, longfin tuna have wrinkly skin and a fin that extends around two-thirds of the way up their back.

Shortfin tuna grow to around 1 metre long and usually weigh no more than 3 kg. This species has fins on the bottom and top that are almost the same length and extend roughly halfway up its body.

Longfin tuna prefer fast-flowing water with rocky beds, whereas shortfin tuna prefer slower water, living in lakes, rivers, streams and wetlands.

Tuna are unable to move past large dams, perched culverts, tide gates, and other similar obstacles. These barriers block the species from travelling upstream to the habitat they need.

In the Waikato, there is a trap and transfer programme that moves tuna upstream past the hydroelectricity dams. Migration downstream, however, remains a significant issue. Historically, tuna only made their way as far as Huka Falls in the Waikato Awa, and were absent from Taupō Moana. They were, however, naturally found in the Upper Waikato Fisheries Area.

Tuna only breed once in their lives. When they are ready to breed, they stop eating, and their head and eyes undergo a change in shape. They then head downstream during periods of high river flow, out to the Pacific Ocean, where they gather to breed. Adults die after breeding.

The larvae of tuna look like tiny see-through leaves. It takes them between 9 and 12 months to drift from the Pacific to Aotearoa. When they near the coast, they change shape into transparent juvenile eels called glass eels. At this stage, you can see their tiny beating hearts right through their skin. After a few weeks hanging out in estuaries, glass eels start to colour up and turn into elvers, or juvenile eels. The elvers migrate upstream and eventually mature into adults.

5.6 Īnanga

Conservation status:
At Risk – Declining

Īnanga (*Galaxias maculatus*) are a small, native fish that swim in shoals.

They grow to approximately 10 cm in length. Their juveniles make up most of the whitebait catch in Aotearoa. They are related to kōaro and the kōkopu species.

Īnanga are poor climbers and can't get past even small barriers in the water. This means they're usually found close to the coast, although in large, slow rivers they can go quite far inland. In the Waikato, their natural passage is now blocked by the hydroelectric dams.

Most Īnanga only live for one year. They travel to estuaries to breed and lay their eggs on plants in very shallow water during spring tides. When the tide recedes, the eggs are left out of water to develop until they hatch on another spring tide two to six weeks later. After hatching, the Īnanga larvae travel out to sea where they live for six months, before travelling back upstream as whitebait.

Īnanga like reasonably slow-flowing water. They feed visually, so they need clear water to see their kai. Unlike their cousins, who mostly come out at night, Īnanga are active during the day.



Īnanga. Jacqui Geux. iNaturalist

We cannot be certain that Īnanga were naturally present in the fisheries area historically. The term Īnanga was often used as a generic name for the young of galaxiid species in general. It's possible that the Īnanga referred to in iwi kōrero about the Upper Waikato Fisheries Area were in fact kōaro whitebait. Additionally, it is a long way to travel for a poor climber.



Īnanga. Jeremy James. iNaturalist

However, we have included Īnanga in this plan for two reasons:

- There is one (somewhat inexplicable) record in the New Zealand Freshwater Fish Database ('NZFFD') from 2015 of an Īnanga in Lake Māretai, and more importantly
- We cannot rule out that Īnanga were absent in the past, as they may have been able to swim well inland in this low-gradient river, before the dams were established.

Any present-day persistence of Īnanga in the Fisheries Area would need active management. They cannot form land-locked populations, so they would need a trap and transfer programme from below the dams. Any individuals transferred upstream would be lost from the breeding population unless they were also transferred downstream for the spawning season.



Īnanga. Shaun Lee. iNaturalist

5.7 Toitoi (Bullies)

Conservation status:
Not Threatened

Common bully (*Gobiomorphus cotidianus*) are found all over Aotearoa.

Although they are not considered a kai source for Ngāti Tūwharetoa, they are a great kai for tuna and, of course, important in their own right.

They are bigger than īnanga, and can grow up to 15 cm.

Toitoi like still and slow-flowing water, and are active during the day. They will come into the shallow water at the lake and river edges. Toitoi hang out at the bottom of the water and move with a quick dart-and-rest motion. This all makes them much more visible than many of our other ika (fish).

Common bully. William Harland. iNaturalist



Common bully. Shaun Lee. iNaturalist

In summer, females lay eggs underneath rocks and wood. Males fertilise the eggs, then stay with them to guard them. After hatching, the larvae float around as plankton for a while, feeding on zooplankton. When they're about 18 mm long, they switch to become a bottom-living fish.

5.8 Banded kōkopu

Conservation status:
Not Threatened

Banded kōkopu (*Galaxias fasciatus*) are one of the five migrating galaxiid species in Aotearoa that travel up our rivers as 'whitebait' each year.

The juveniles are excellent climbers, like the kōaro. They grow to about 200 mm long, and the adults have thin pale bands on their bodies, which gives them their name. They live in pools in small streams and need complete overhead shade, as well as cover such as boulders, undercut banks, or logs. They mainly feed on terrestrial insects that fall into the water. They detect their prey by sensing the vibrations and ripples that the insects create on the water's surface.

It is difficult to be sure that banded kōkopu were present in the Fisheries Area. Traditional kōrero

Banded kōkopu. Oscar Dove. iNaturalist



Banded kōkopu. wild_wind. iNaturalist

for Lake Taupō includes kōrero about a kōkopu, including the kōkopu introduced to the lake by Ngātoroirangi. In 1919, Fletcher identified these as banded kōkopu. However, as noted, the term kōkopu may have been a word used for a life stage of the kōaro, rather than a kōkopu species as we know them today.

Additionally, there are no records of banded kōkopu in the Upper Waikato Fisheries Area on the NZFFD. Despite being excellent climbers, banded kōkopu are usually only found close to the coast. A complicating factor is that banded kōkopu are very sensitive to suspended sediment. It is possible that sediment impacts are unnaturally restricting banded kōkopu to coastal areas, and that they could have been found much further inland in the past. We have included banded kōkopu in this plan, despite the lack of records, as we cannot rule out that they were present in the past.

Currently, the hydroelectric dams in the Upper Waikato River Area block banded kōkopu coming upstream from the sea. However, banded kōkopu can form land-locked populations, so it's possible they could persist in the fisheries area if introduced or reintroduced.

5.9 Piharau

Conservation status:
Nationally Vulnerable

Piharau (*Geotria australis*) are a fantastic fish. They come from an ancient evolutionary lineage and have no jaw. Their skeleton is composed of cartilage, like that of sharks, rather than bones. As adults, their mouth is a round sucker disc. They latch on to other fish or whales using this sucker disc, and parasitically feed on the blood, flesh and body juices of that fish or whale.

Piharau spawn in freshwater, in nests under boulders. The larvae resemble small, white worms. They burrow into soft sediment. At night, they partly emerge from the sediment and filter feed on algae and microscopic organisms in the water. The larvae live in freshwater for about three to five years.

After this period, they transform into a juvenile fish with a sucker disc and fins, and move downstream to travel out to sea. They then spend about three or four years at sea feeding off other fish before returning to freshwater to spawn. As spawning adults, from the time in which they come in from the sea, to when they die, they do not eat – an astounding period of around 15 months without food.



Piharau. Inao Vasquez. iNaturalist

Threats faced by the piharau include:

- habitat loss
- barriers to migration
- contaminants in the water
- predation
- parasites and disease, and
- fishing.

Traditionally, piharau may have been present in the Fisheries Area. They can migrate a considerable distance inland and have been found at altitudes up to 300 metres above sea level. Nowadays, their inland migration is blocked by hydroelectric dams.

There are no formal records of piharau in the Fisheries Area. Still, they are notoriously difficult to detect using standard fish monitoring methods, and as a result, they are underrepresented in fish records on the NZFFD.

5.10 Ngaore (Common smelt)

Conservation status:
Not Threatened

Ngaore, also known as common smelt (*Retropinna retropinna*), are a shoaling fish that swim near the water's surface. Although native to Aotearoa, they were not naturally present in Taupō Moana. They were introduced into the lake as food for trout after the natural kōaro population suffered heavily from predation by trout and declined in numbers.

Smelt spawn on sand bars in slow-moving or still water, between half a metre and two and a half metres deep. Adults usually die after spawning, at around one year of age.

Juvenile smelt are sometimes part of the whitebait catch.

Ngaore are poor climbers, but are good at swimming. In the Waikato region, they were able to travel considerable distances inland naturally. However, smelt most likely weren't able to make their way as far inland as the Upper Waikato Fisheries Area, naturally.

In current times, the migration of smelt from the sea is blocked by the numerous hydroelectric dams situated along the river. The species present in the area are now most likely to have originated from the introduced population in Lake Taupō.

In lakes where smelt have been introduced, kōaro numbers decline. In some cases, kōaro disappear altogether when trout are introduced.

Common smelt. James Crofts-Bennett. iNaturalist



5.11 Trout

Conservation status:
Introduced and naturalised

European settlers introduced brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) to Aotearoa in the early 1890s.

In a High Level Agreement between Ngāti Tūwharetoa and the Crown, it was acknowledged that the introduction of rainbow trout has resulted in the species flourishing, at the expense of native species.

Brown trout. Jon Sullivan. iNaturalist



Rainbow trout. Michael Beradozzi. iNaturalist

Trout prey on native fish, especially galaxiids, and compete with native fish for food and habitat.

Despite this, trout have become an essential source of kai for Ngāti Tūwharetoa, and are often regarded as taonga.

5.12 Goldfish

Conservation status:
Introduced and naturalised

Goldfish (*Carassius auratus*) live in ponds, lakes and slow-flowing rivers and streams.

Although introduced to Aotearoa, they are not considered a pest.

They can grow to around 200 mm long and, in the wild, are often dull in colour, rather than the bright orange we usually associate with captive goldfish.

They eat plants, insects and crustaceans.

Goldfish. Jacqui Geux. iNaturalist



5.13 Guppy

Conservation status:
Introduced and naturalised

Guppy (*Poecilia reticulata*), similar to goldfish, have been introduced to Aotearoa. However, they are not considered a pest species.

A tiny tropical fish, guppy are most likely only found in the warm geothermal waters near Reporoa. They only grow to about 60 mm in length, and they look very similar to Gambusia.

They are a social fish, living in small groups, and are omnivorous.



Guppy. Franz Anthony. iNaturalist

5.14 Rudd

Conservation status:
Introduced and naturalised

Juvenile rudd (*Scardinius erythrophthalmus*) are green-silver, and adults are usually pale orange with an olive green back. Both adults and juveniles have bright orange fins. They are stocky, growing up to 35 cm long and weighing up to 500 g.

They live for around 17 years and can breed from one year of age, meaning that a single rudd can produce a large number of offspring in its lifetime.

Rudd live in lakes, ponds, and slow-flowing streams. They prefer places with an abundance of aquatic plants, can survive in water of poor quality, tolerate low oxygen levels, and thrive in water with high salinity. This species eats both plants and animals.

Rudd are considered a pest primarily because they compete with native fish for food. Because they breed so quickly, they can easily outnumber native fish.

When rudd are present in large numbers, they have been known to feed on native plants, leaving nothing behind, which contributes to degraded water quality.

Rudd has a different pest status in different parts of New Zealand.

In the Eastern Fish and Game Region, rudd are listed as a pest. This covers the majority of the Upper Waikato Fisheries Area that lies within the Ngāti Tūwharetoa rohe. In the Auckland / Waikato Fish and Game region, which covers the remainder of the Tūwharetoa Fisheries Area, Rudd are considered a sports fish.

Everywhere else in Aotearoa, they are classified as a Noxious Fish.

Rudd. Nasser Halaweh. iNaturalist



5.15 Gambusia

Conservation status:
Introduced and naturalised

Gambusia (*Gambusia affinis*) are an ‘Unwanted Organism’ under the Biosecurity Act 1993.

Gambusia are small, pale fish, with males growing up to 4 cm and females up to 6 cm. They live for around a year and breed from as early as six weeks old. They give birth to live young, rather than laying eggs, which means that the number of Gambusia can grow rapidly. They can quickly outnumber its native counterpart.

Gambusia are tolerant of a range of conditions, such as highly saline water, poor water quality,

and low oxygen levels. They can survive in both cold and warm water, although they prefer warmer water.

They live in slow-moving water, on the edges of ponds, wetlands, and streams. They eat small insects, larvae, plants, algae, and native fish eggs, which make up a small portion of their diet.

Gambusia are aggressive fish that will attack native fish, nipping at their eyes and fins. They compete with native fish for food.

Large numbers of gambusia in a waterbody affect the number of native insects found there, as the fish feed on insect larvae and prevent the insects recruitment.

Gambusia. Shaun Lee. iNaturalist



5.16 Brown bull-headed catfish

Conservation status:
Introduced and naturalised

Brown bull-headed catfish (*Ameiurus nebulosus*) are classified as ‘unwanted organisms’ under the Freshwater Fisheries Regulations 1983.

They were introduced to Aotearoa in the late 1800s, but the species remained confined to the lower Waikato River and Lake Mahinapuna for decades. They were first recorded in Taupō Moana in 1985 and have since spread down the Waikato Awa. They are slowly spreading to other locations in Aotearoa, most likely on boat trailers and in fyke nets that are used by commercial eelers.

Compared to our native fish, the brown bull-headed catfish is considered large, growing up to 30 cm long. They range in colour from shades of dark brown to olive green. They have eight barbels around their mouths, which they use to find their prey. With sharp spines often present on their fins, people can be injured if they come into contact with catfish.

Catfish will eat meat, insects, crustaceans, shellfish, and small fish. They will also prey on freshwater kōura. They are a tough fish, and are highly tolerant of poor water quality, as well as being able to survive extensive periods of time out of the water. Brown bull-headed catfish can produce up to 6,000 offspring in one season.

This species can contribute to the degradation of water quality by stirring up silt from the bottom of rivers and lakes as it searches for food.

Brown bull-headed catfish. Shaun Lee. iNaturalist





6 ISSUES AND THREATS

the Vision and Strategy respond to



Issue 1A
Tino rangatiratanga of Ngāti Tūwharetoa is not adequately recognised

Passed down by our tūpuna, Ngāti Tūwharetoa have an ancestral duty to protect our lands and water.

This connection is an expression of our rangatiratanga.

The inherent right of Ngāti Tūwharetoa to exercise tino rangatiratanga over the Waikato Awa is not consistently acknowledged in planning and decision-making processes.

As a result, we often have limited control over decisions that impact our ancestral awa.

Issue 1B
Barriers to Ngāti Tūwharetoa fulfilling our role of kaitiakitanga

When events or actions impede our ability to provide adequate protection to the river, we not only carry the burden of guilt towards our Awa Tūpuna, but we also experience whakamā (embarrassment) as our role as kaitiaki of the headwaters may be called into question. We have a duty to protect the waters within our rohe and practice kaitiakitanga so that our river whanaunga downstream are not compromised. This comes with an immense sense of responsibility.

Despite our role as kaitiaki, we are often excluded from meaningful participation in environmental and freshwater management, planning, and decision-making. Resource consents and policy processes frequently proceed without adequate engagement, diminishing the protective and restorative role of iwi.

Ngāti Tūwharetoa are not adequately resourced to carry out their obligations as kaitiaki. Insufficient funding and organisational capacity often restrict our ability to engage in environmental planning processes, freshwater monitoring and restoration, and cultural values and impact assessments. Systemic and legislative obstacles can prevent our active involvement in resource management and limit the effectiveness of agreements such as those related to the transfer of powers, duties, and functions to Ngāti Tūwharetoa.





Issue 2

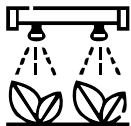
Issue 2A Degradation of mauri

The mauri of the Waikato Awa is threatened by inappropriate, unsustainable, and culturally insensitive land use and water management practices. The health of the awa is intrinsically linked to the hauora (well-being) of our people. If the mauri of the wai is compromised, so too is the ability of the awa to sustain the wairua of the people of Ngāti Tūwharetoa.



Issue 2B Loss and degradation of habitat

In Aotearoa, an overwhelming number of freshwater fish are threatened with extinction, or are at risk of becoming threatened. Many populations are also decreasing in size. The loss and degradation of habitat plays a major part in diminishing species abundance. This can be via drainage, channelisation, and modification of our streams and wetlands, as well as poor land management. Habitat loss impacts biodiversity, and reduces our resilience to climate change. Degradation of important habitat has consequences for species in our customary fishery that Ngāti Tūwharetoa rely on as a source of kai.



Issue 2C Stormwater entering waterways

Rainwater from solid surfaces, such as roofs, roads, and asphalt, commonly referred to as 'stormwater,' can contain a wide variety of contaminants. These include hydrocarbons from vehicles and industrial yards, as well as heavy metals such as copper from brake pads and zinc from tires, metal roofing, and industrial yards. Microplastics, pesticides, industrial compounds, and pharmaceuticals can also be found in stormwater. Pathogens, such as bacteria and viruses, are also found in stormwater. When contaminant-laden stormwater enters the river, it depletes the mauri of the wai, and diminishes water quality.

Stormwater can also impact the natural flow patterns in streams and rivers. Instead of slowly infiltrating into the ground or making its way across the leaf litter and soil to reach a stream, water that falls on solid surfaces takes a much more rapid path to the nearest water body. This means that water levels rise and fall much more quickly than they would naturally, which can be described as 'flashiness'. Fish often find it hard to find shelter during these 'flashy' increases in flows.



During heavy or prolonged rain events, stormwater can exacerbate and cause erosion. Flows can erode riverbanks, leading to large volumes of sediment entering the water. As the Waikato Awa runs through the Taupō town centre and many residential neighbourhoods, it is subjected to numerous stormwater discharges, both piped and via overland flow.

When the stormwater network is not able to cope with the volume and intensity of rainfall, it can then infiltrate the wastewater network, which can then become overwhelmed. This can lead to untreated wastewater entering the wai. For example, in 2019 a water main burst after an extended period of intense rainfall. This led to the collapse of a bank on the edge of Lake Taupō, damaging a wastewater pipe. This resulted in large volumes of raw, untreated wastewater flowing into the lake for around 2 hours.





ISSUE 2

Issue 2D

Wastewater discharges

Wastewater discharges impact water quality, conflict with our cultural values, and degrade the mauri of the Waikato Awa.

There are many consented discharges of wastewater to the awa, all of which are of concern to Ngāti Tūwharetoa. In addition, poorly maintained infrastructure and networks at capacity can also result in unplanned discharges of wastewater to the Waikato Awa. For example, a wastewater pump located in the Taupō Marina frequently leaks and releases wastewater directly into the water.

In another example, population growth on the northern side of the Waikato Awa means that the pipe carrying wastewater across the river to the Taupō wastewater treatment plant is almost reaching capacity. This has resulted in numerous overflows of untreated wastewater directly into the wai.



Issue 2E

Agricultural runoff

All of the monitored tributaries of the Waikato Awa from Taupō to Karāpiro have shown a worsening trend in nitrogen concentrations between 1990 and 2020. This is not a surprise, as the area has experienced the most significant pastoral intensification in the Waikato Region, with large areas of land being converted from pine forest to dairy pasture.

The dominant source of nitrate entering waterbodies is urine from farm animals. If plants and microorganisms are unable to use all of the nitrogen, it can then drain from the soil and enter the groundwater system. From here, nitrate can enter our streams and rivers, and in some cases have serious ecological consequences.

Runoff from farms often contains elevated levels of nutrients such as nitrogen and phosphorus. In large quantities, these can contribute to water quality decline, eutrophication and cause excessive algae and plant growth. Agricultural discharges can also contain harmful pathogens, and include heavy metals such as lead, cadmium, arsenic and chromium, which are present in pesticides. Heavy metals can accumulate in the soil and water, and when in excess, can become toxic to both ecosystems and human health.

Issue 2F

Geothermal discharges

Untreated or poorly managed discharges from geothermal power generation activities can alter the chemical composition and temperature of the awa, which can harm aquatic species and diminish the ecological integrity of the wai.



The Wairākei Geothermal Power Station discharges geothermal fluid into the Waikato Awa. While improvements in the discharge have reduced arsenic levels, they still exceed levels considered safe for human consumption. Ngāti Tūwharetoa rely on water treatment to lower arsenic levels before it is safe to drink.

Wairakei Geothermal Station



Issue 2G

Impacts of introduced and pest species

In some cases, the interactions between aquatic species can be unfavourable. Introduced and/or pest species can outcompete or prey on native species, and damage or destroy their habitat.

This can disrupt the balance of aquatic ecosystems and have serious consequences for the health and abundance of species in our customary fisheries.

Pest plants can hinder our safe access, and use of the Waikato Awa by reducing water visibility and creating large carpets of weed across the surface of the water, in which people can become tangled.

Once a popular swimming spot, Ātiamuri Moana is no longer used for kaukau (swimming) due to the presence of lakeweed such as *Ceratophyllum* (commonly known as 'Hornwort') and *Lagarosiphon* (known as 'Lakeweed').

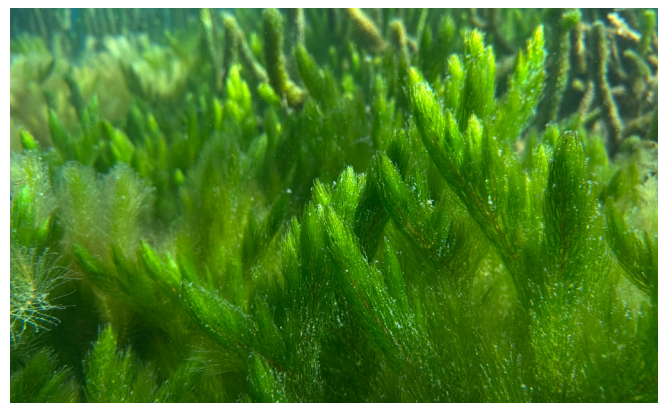
Section 5 provides an in-depth discussion on introduced and pest species, and how they can impact native and taonga species.



Lagarosiphon. M Rutherford. iNaturalist



Hornwort. Joe Dillon. iNaturalist

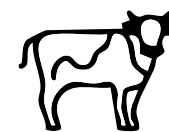


Hornwort. Shaun Lee. iNaturalist

Issue 2H

Stock access to waterways

Livestock entering waterbodies cause physical damage to streambanks, contribute pathogens and sediments, and compromise water quality. Livestock access to rivers and streams causes direct contamination through defecation, trampling of streambanks, and sediment disturbance. This leads to habitat degradation, reduced water quality, and disruption of aquatic life.



ISSUE 2

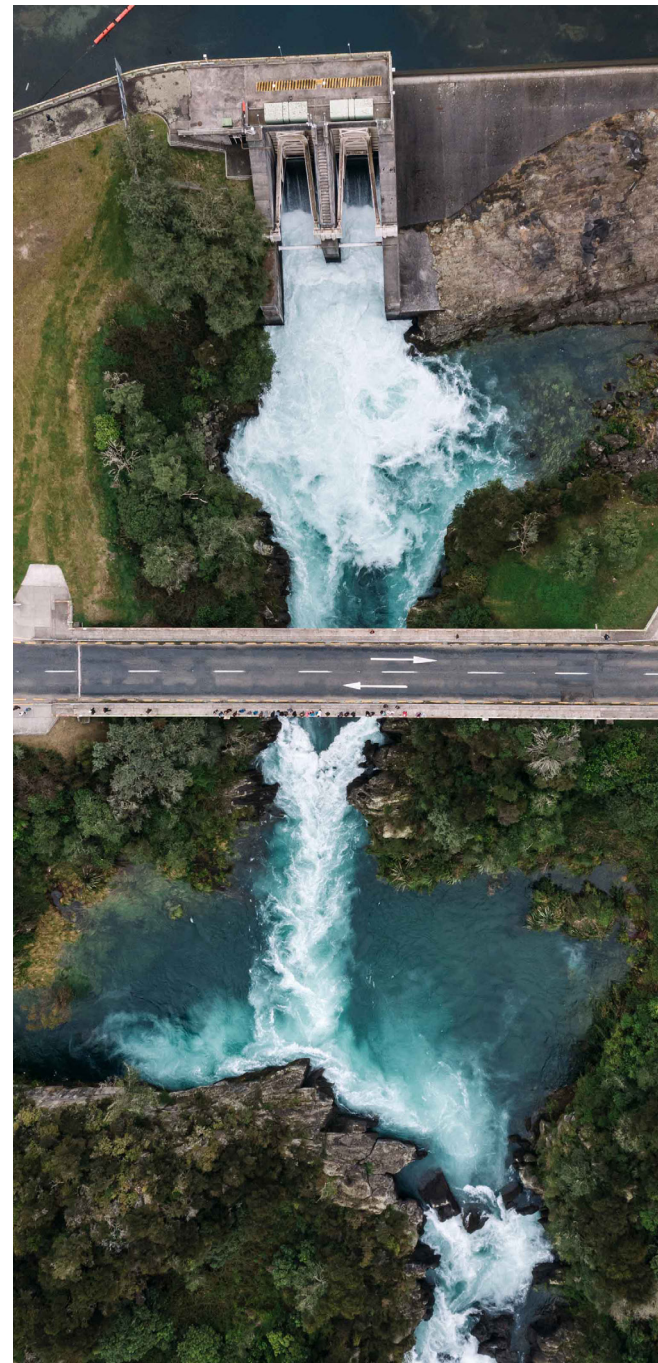
Issue 2I

Structures alter river flow, form and function

Dams, weirs, culverts, fords, stop banks, and floodgates are examples of structures used to dam, divert, or control water in our rivers. These structures can change natural water levels, flows and patterns. This alters the habitat available for fish, for example, by removing fast-flowing habitats found in riffles and rapids and creating uniform slow-flowing lakes behind dams. The changes to flow patterns mean that spawning or migration cues can be affected. Water temperature can also be modified by damming rivers. By confining waterways to defined channels, this can alter the volume of water, the rate of flow, natural flow variations, and the relationships between other waterways.

If a river is not able to travel unobstructed mai uta ki tai (from the mountains to the sea), this impacts its mauri (essence/life force).

The ancestral path of our waters, as our tūpuna knew them, has experienced irreversible change, with the natural form of the awa now existing only in our memories. The river was first modified in 1926, when work was carried out to narrow the pūau. The diversion of the awa and construction of the control gates began in 1941 to raise water levels, benefiting the hydroelectric power stations being developed downstream.



Aratiatia Dam

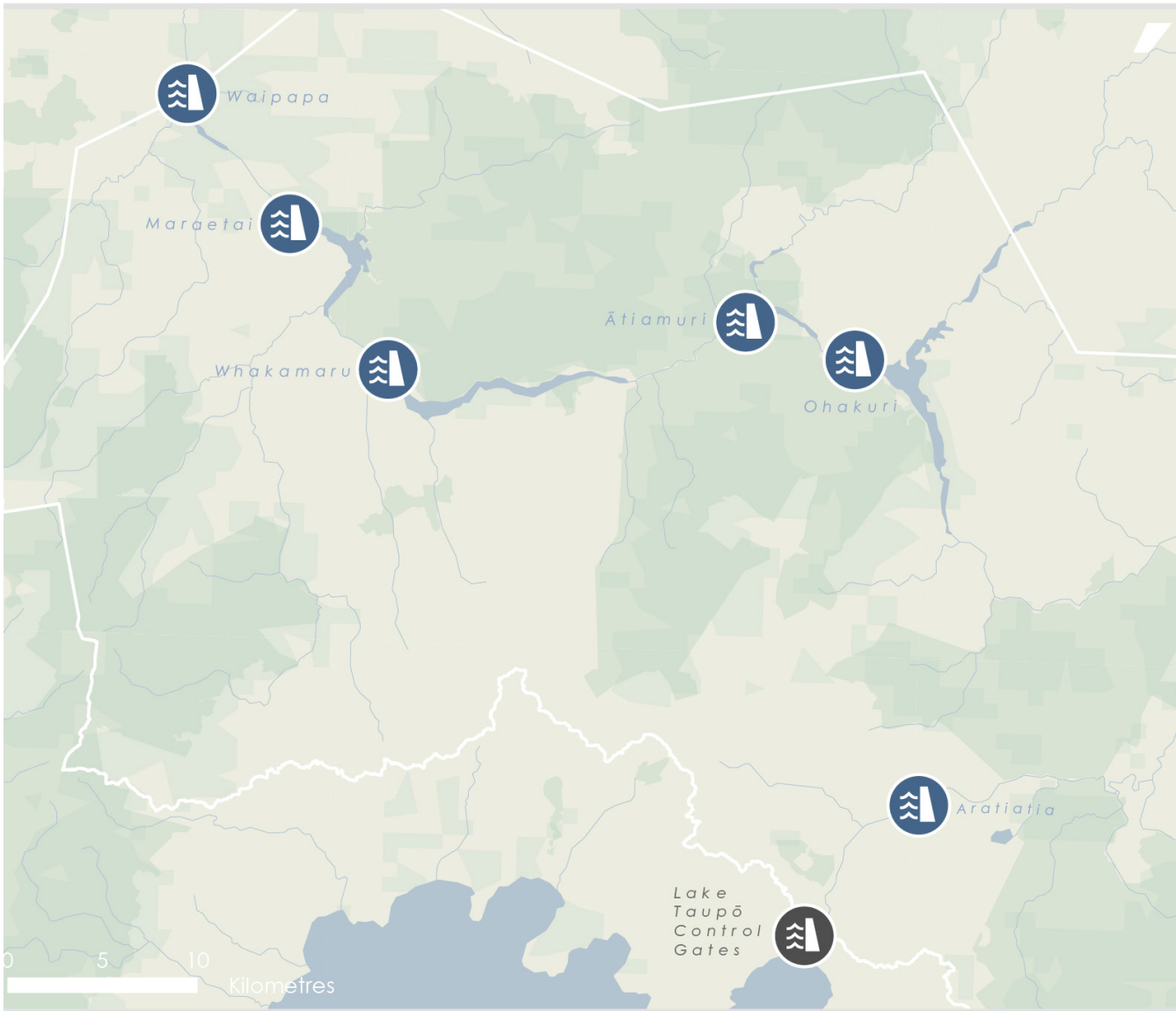
The Waikato Awa was diverted to accommodate the flood control gates at the pūau, and those gates serve as a painful and persistent reminder of how we were powerless to protect our ancestral waterway.

Ever since, the river has been subject to continual disturbance and control.

Today, there are eight hydro dams and lakes within the Upper Waikato Fisheries Area – Aratiatia, Ohakuri, Ātiamuri, Whakamaru, Maraetai, Waipapa, Arapuni and Karāpiro. Of these, all but Arapuni and Karāpiro are in the Ngāti Tūwharetoa Area of Interest (see Fig. 9).

Controlling the flow of the Waikato River: Progress of Diversion Scheme near Lake Taupo





9. Location of Hydroelectric Dams along the Waikato Awa in the Ngāti Tūwharetoa rohe

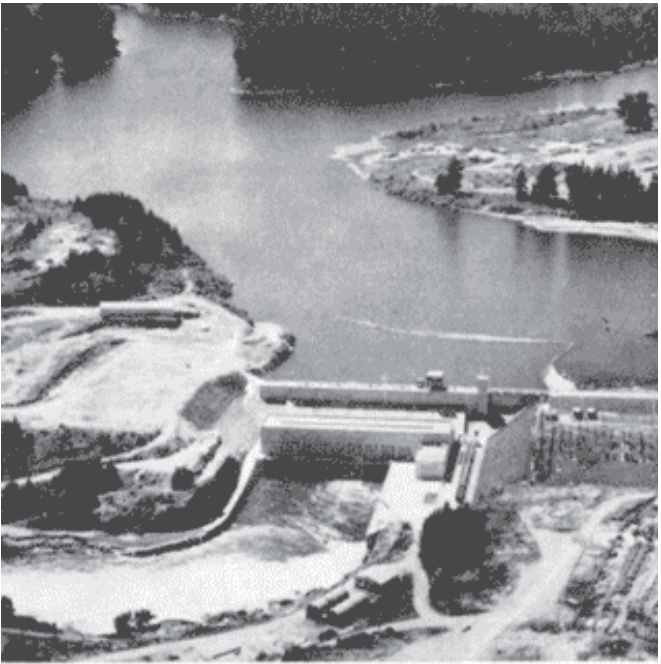


The actions of the Crown remain a source of immense distress and mānāe (hurt) for Ngāti Tūwharetoa. Whānau recall the coercion of the once-wild and meandering river into a new path in pursuit of the economic benefits that hydroelectricity promised. The kōrero of a Te Hikuwai hapū member reflects this loss:

“
We draw strength from the water, we are healed by these waters and so when the lake hurts, we hurt. And it's a cumulative pain, a historical pain and trauma.
”

The remedy for healing the awa and our people, and restoring the mauri which nourishes our wairua, is not straightforward. There are whānau that believe that an uninhibited flow of the water, free of built obstacles, should be the ultimate aspiration if the mauri of the awa is to be restored. But at the least, there is consensus amongst the iwi that steps should be taken to restore the natural character, form and function of the Waikato River, wherever possible, to uphold the mana of the wai, and to support Ngāti Tūwharetoa's cultural connection to, and customary use of, the awa.

Atiamuri Dam and Powerhouse, Waikato River. 1966. Te Ara - the Encyclopaedia of New Zealand.



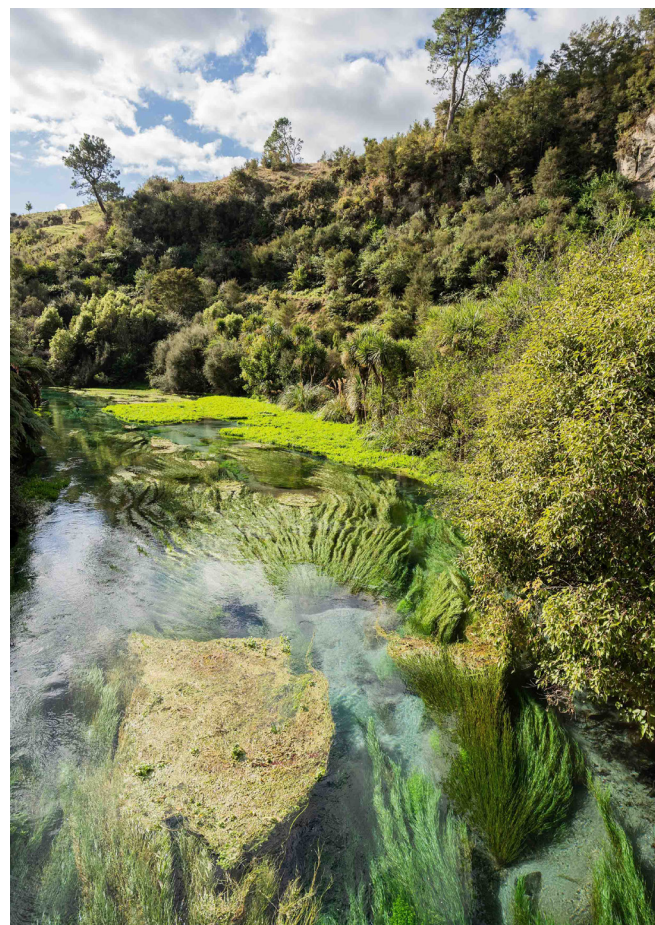
Issue 2J Erosion and sedimentation

Erosion along the banks of the river, and sediment entering the wai are serious issues for Te Awa o Waikato. The channelisation of waterways can increase the volume and rate of flow, leading to increased erosion and sedimentation. Land use activities near stream margins such as earthworks and soil disturbance, vegetation clearance and agricultural activities also contribute to erosion and the subsequent discharge of sediment to our awa.

Sediment is a serious contaminant in our waterways for a number of reasons. It can cover the spaces between rocks that fish, kōura and stream insects use to live in and hide amongst, and smothers places where fish lay their eggs. Sediment can block the sunlight from reaching the stream bed, preventing the growth of 'good' algae, which stream insects rely on as a source of kai. It can also make it difficult for visual feeders like īnanga to find their food. When sediment enters our streams, it carries nutrients into the water. It can result in reduced oxygen levels in the stream bed, and even damage the gills of aquatic creatures.

Sediment has profound impacts for Ngāti Tūwharetoa. When it's muddy and conditions are poor, it can be tricky for whānau to access

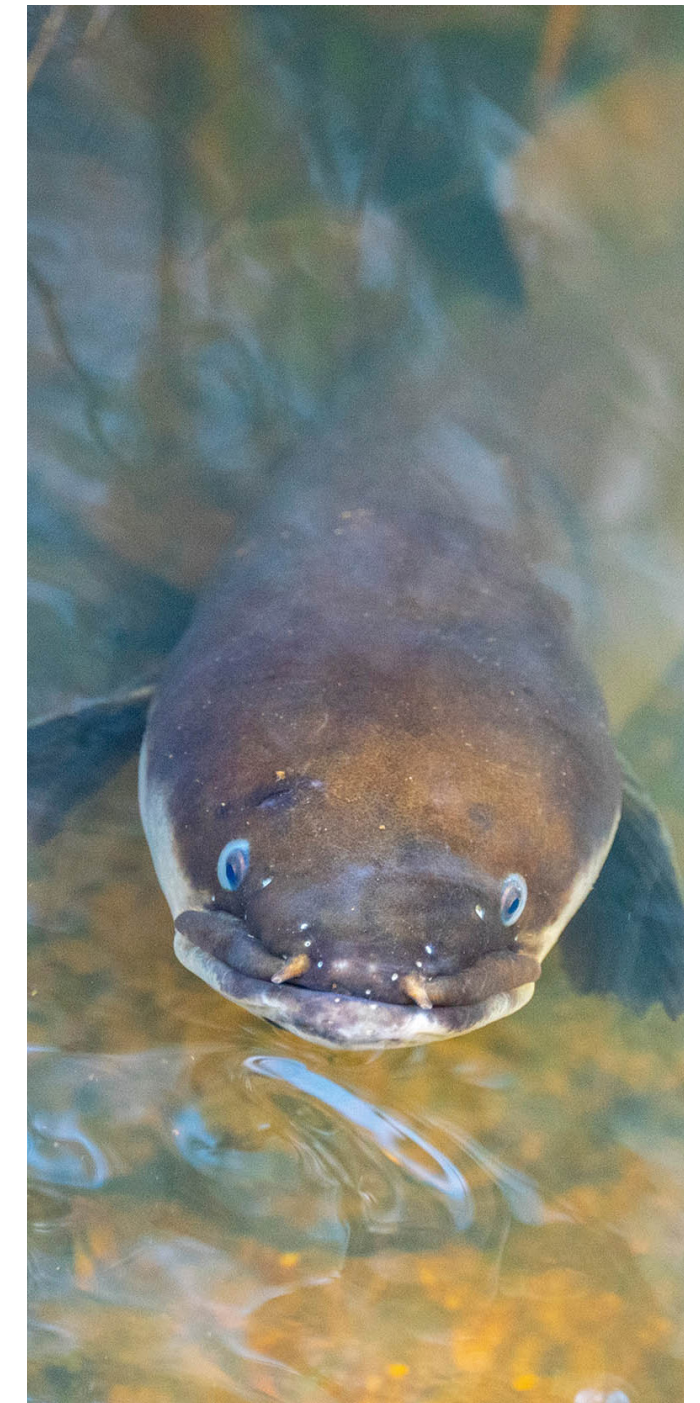
the awa, and this affects our connection, and our ability to do ritenga (rituals) such as ruruku. Sediment can reduce the clarity of the water, creating risks for people entering the water and kaukau (swimming) due to unseen obstacles. Hī ika (fishing) with methods such as rama tuna and rama kōura is more difficult, because these techniques require good visibility in order to find the kai.



Issue 2K Barriers to fish passage

When fish movement is delayed or blocked entirely, many species are unable to complete their lifecycle. This can result in a reduction of fish in a stream, or the species may even be lost from the stream entirely. Culverts, dams, weirs, and other artificial structures prevent migratory native fish from completing their life cycles. These barriers can disrupt ecological connectivity between habitats, and result in diminished populations.

Dams and other structures in the Waikato Awa block the upstream and downstream migration of fish species, such as tuna (eels). While there is a trap and transfer programme for elvers (juveniles), we could not find evidence of any organised transfer of tuna heke (adult eels migrating to breed) safely out of the dams, even though doing so is encouraged. This is a significant concern to Ngāti Tūwharetoa. Other fish species do not have a trap and transfer programme of any sort. This means that vast areas of habitat are cut off to them, which is also of great concern to Ngāti Tūwharetoa.





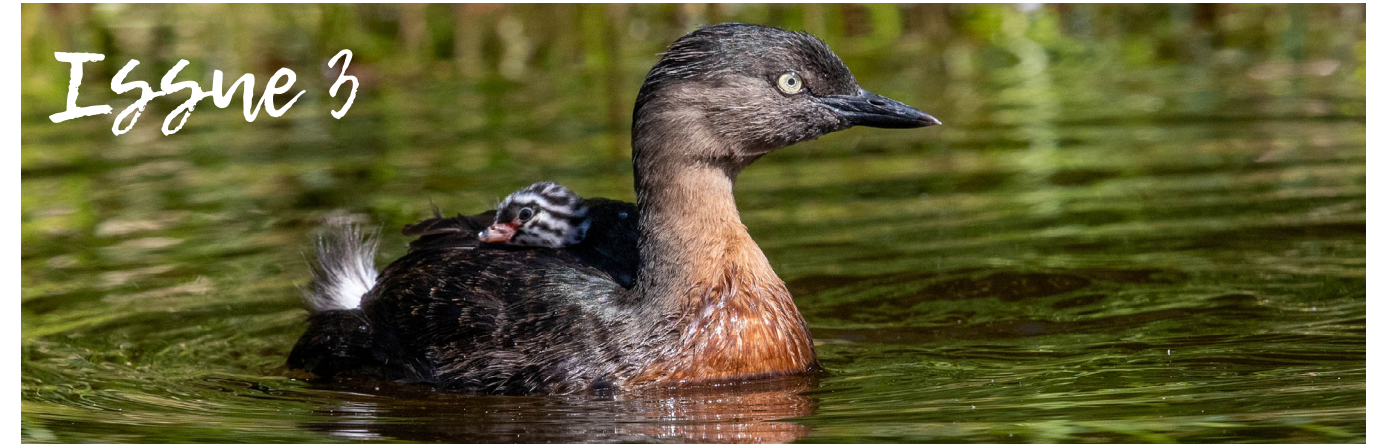
Issue 2K Climate change

Ngāti Tūwharetoa have serious concerns about the anthropogenic (human-induced) contribution to climate change, as well as the impacts that our changing climate has on our taiao and our people now, and into the future.

In Aotearoa, the average annual temperature has increased by 1.13 °C between 1909 and 2019. In the Waikato Region, long-term trends indicate a consistent decline in rainfall, and the frequency of drought and levels of evapotranspiration are predicted to increase. This can result in reduced base flows and affect the health and survival of aquatic species. A decrease in flows and water depth also threatens Ngāti Tūwharetoa's ability to carry out cultural practices dependent on the river.

The past impact of climate change on our Awa Tūpuna is evident, and future impacts are inevitable. The increased intensity, severity and frequency of extreme weather events that is predicted has the potential to increase flooding and worsen erosion, with consequences for nga tangata, te whenua, me te wai (our people, the land and the water).

Ngāti Tūwharetoa recognise that actions to mitigate the impacts of climate change are needed urgently, as well as measures to adapt and build resilience for our communities and freshwater environments.



Issue 3A Barriers to access

Ngāti Tūwharetoa are deeply concerned about the loss of access to our ancestral awa. Barriers to access impact the ability of our hapū and whanau to practice cultural and customary activities, which are central to our identity and support our wairua.

There are numerous legal and physical barriers which hinder our access. Many of the tributaries to the Waikato Awa, and the mainstem itself, are surrounded by privately owned land, often

used for agriculture. This poses a legal barrier to Ngāti Tūwharetoa's access to the wai. Where public access is available, or access is granted over private land, physical barriers often remain. This can create health and safety risks, as people cross unstable or unsafe terrain and traverse operational farms.

In many places, commercial use of the river is prioritised over recreational use (for example, restrictions due to the operation of the Huka Jet). On the other hand, the navigation of watercraft is enabled, at the cost of recreational uses such as kaukau (for example, access to the pūau is restricted, due to its classification as a 'navigable channel' under the Lake Taupo Navigation Safety Bylaw 2010).



The construction of hydroelectricity power stations and other structures means that many parts of the river are fenced off, with access prohibited due to security reasons and health and safety risks. Modifications to the river have resulted in changes to water levels and the subsequent loss of many historic access points through submersion or erosion. In some cases, alterations to the flow regime render access points unsafe for use due to increased water depth and velocity.





Issue 4A
Safety of kai is compromised

The Waikato River and its tributaries were once a thriving food basket from which Ngāti Tūwharetoa were sustained. Colonisation, along with the associated urbanisation, deforestation, agricultural intensification, and industrial growth, has taken a toll on the natural and physical resources of our rohe.

The quality of water in the Waikato Awa has declined to the point where many mahinga kai

species are unsafe to gather or consume, or are no longer abundant. The contamination of wai poses a threat to the health of our Awa Tūpuna. As a consequence, the ability of our people to undertake cultural practices tied to the harvest of kai, is eroded.

There are many places along the Waikato Awa and its tributaries, where our taonga species once thrived, but can no longer be found.



Issue 5A
Loss of cultural identity and connection

The cultural identity of Ngāti Tūwharetoa and our relationship to our Awa Tūpuna is not sufficiently visible in the landscape. In addition, our connection is often not recognised in the public domain, and the integration of mātauranga Māori in the planning, design and use of our spaces is often neglected.

Issue 5B
Lack of protections for wāhi tapu

Wāhi tapu and wāhi tūpuna along the Waikato Awa and its many tributaries are vulnerable to inappropriate land use, subdivision, and development.

Ngāti Tuwhaertoa are currently limited in our ability to protect our sites of cultural significance, and are concerned about the lack of formal protection.





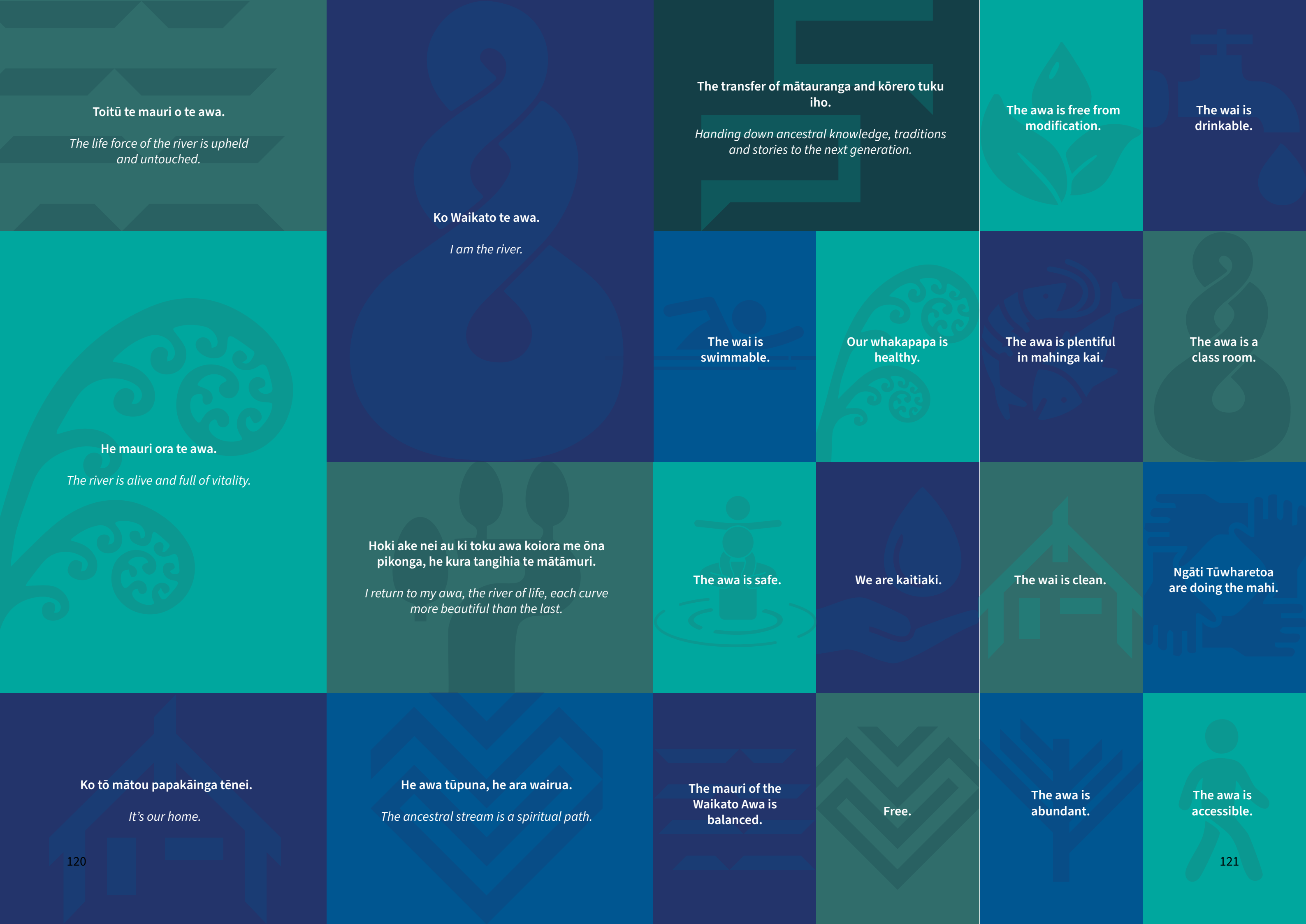
7.1 Ngā tūmanako

Ngā Kaihautū members were asked to describe their tūmanako (aspirations) for the Waikato Awa in only a few words. Their answers are summarised on the following two pages.

7 OBJECTIVES, POLICIES AND METHODS

our aspirations





Toitū te mauri o te awa.

*The life force of the river is upheld
and untouched.*

Ko Waikato te awa.

I am the river.

The transfer of mātauranga and kōrero tuku
iho.

*Handing down ancestral knowledge, traditions
and stories to the next generation.*

The awa is free from
modification.

The wai is
drinkable.

He mauri ora te awa.

The river is alive and full of vitality.

The wai is
swimmable.

Our whakapapa is
healthy.

The awa is plentiful
in mahinga kai.

The awa is a
class room.

Hoki ake nei au ki toku awa koiora me ōna
pikonga, he kura tangihia te mātāmuri.

*I return to my awa, the river of life, each curve
more beautiful than the last.*

The awa is safe.

We are kaitiaki.

The wai is clean.

Ngāti Tūwharetoa
are doing the mahi.

Ko tō mātou papakāinga tēnei.

It's our home.

He awa tūpuna, he ara wairua.

The ancestral stream is a spiritual path.

The mauri of the
Waikato Awa is
balanced.

Free.

The awa is
abundant.

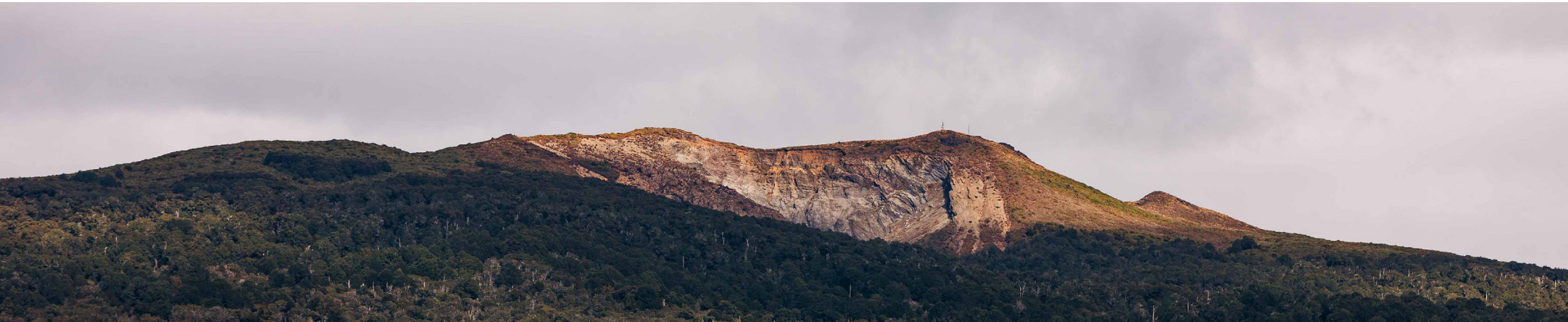
The awa is
accessible.

7.2 Ngāti Tūwharetoa objectives and policies

The objectives in this Fisheries Plan were informed by, and give effect to, Te Ture Whaimana and the Ngāti Tūwharetoa Iwi Environmental Management Plan (IEMP).

Objective 1

NGĀTI TŪWHARETOA EXERCISE TINO RANGATIRATANGA OVER THE WAIKATO AWA



Policy 1.1

Ngāti Tūwharetoa are kaitiaki for the Waikato Awa, which includes its protection, restoration, and monitoring.

Policy 1.2

As kaitiaki, Ngāti Tūwharetoa, are actively involved in planning and decision-making for the Waikato Awa.

Policy 1.3

Ngāti Tūwharetoa are properly resourced to fulfil their role as kaitiaki.

Method 1A

Cultural values assessments or cultural impact assessments are required by the consenting authority for all decisions affecting the Waikato Awa.

Method 1B

When procuring expertise, services or labour, councils will prioritise contracts with Ngāti Tūwharetoa iwi, hapū and whanau.

Method 1C

Ngāti Tūwharetoa will work with councils to identify opportunities for the transfer of functions, powers and duties in relation to the management of the Waikato Awa, including protection, restoration, and monitoring.

Method 1D

Ngāti Tūwharetoa will enter into agreements with councils to enable the transfer of functions, duties and powers in relation to the management of the Waikato Awa to Ngāti Tūwharetoa.

Method 1E

Ngāti Tūwharetoa will work with councils to establish agreed protocols in relation to:

- i. consultation and engagement with Ngāti Tūwharetoa on resource consents
- ii. The role of Ngāti Tūwharetoa in plan-making, which includes (but is not limited to) plan-drafting, engagement and/or decision-making.

Councils will implement and resource any agreed protocols.

Method 1F

Ngāti Tūwharetoa will investigate representation on decision-making bodies involved in the management and protection of freshwater fisheries, including:

- i. Fish and Game
- ii. Regional Council
- iii. Department of Conservation (DOC), and
- iv. Ministry of Primary Industries (MPI).

Method 1G

If Ngāti Tūwharetoa determine they want representation at the decision-making tables of Fish and Game, Regional Council, DOC, and the MPI, those entities will enter into negotiations to establish and resource that representation.

Method 1H

Ngāti Tūwharetoa will investigate representation on decision-making bodies for hydroelectricity generators, so as to increase involvement in the management of structures, geothermal discharges, fish passage and flow regimes along the Waikato Awa.

Method 1I

Ngāti Tūwharetoa and councils will enter into funding agreements that will enable Ngāti Tūwharetoa to:

- i. be actively involved in, and enter partnerships, on projects, plans and processes in relation to the Waikato Awa
- ii. increase their capacity to engage in resource management processes that impact the Waikato Awa and other waterbodies within the rohe
- iii. build knowledge and expertise in freshwater, fisheries and resource management (including eDNA sampling)
- iv. conduct freshwater monitoring and assessments (including cultural monitoring)
- v. restore the health and well-being of the awa.

Objective 2

THE MAURI OF THE WAIKATO AWA IS PROTECTED

Policy 2.1

Protect and enhance the ecosystem health of the Waikato Awa.

Policy 2.2

The water quality in the Waikato Awa is improved and enhanced over time.

Policy 2.3

The Waikato Awa is healthy and thriving and can sustain and nourish the wairua of tangata whenua.

Policy 2.4

The natural character, form, flow and function of the Waikato Awa is preserved and restored.

Policy 2.5

The abundance and health of freshwater habitats in the Waikato Awa is increased and enhanced.

Policy 2.6

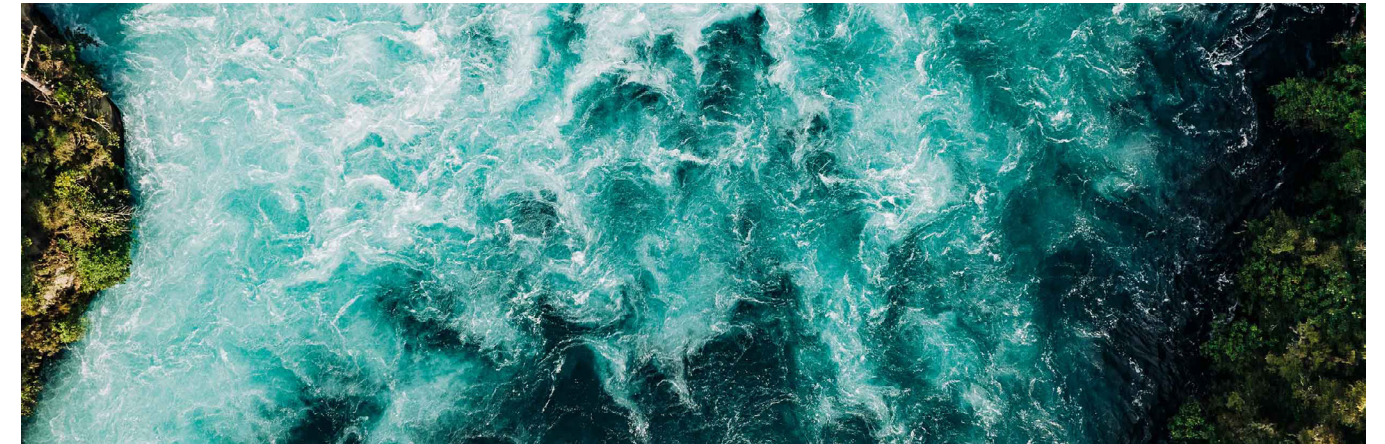
Barriers to fish passage are removed, and native species are able to complete their life cycles.

Policy 2.7

Pest fish are managed to avoid adverse effects on native species.

Policy 2.8

Our understanding of what species are present in the Waikato Awa, and their health and abundance, improves over time.



Method 2A

When considering resource consents for earthworks and soil disturbance adjacent to the Waikato Awa or other waterbodies in the rohe (which include streams, lakes, and wetlands), the District Council must impose conditions that require riparian planting along the margins of such freshwater environments.

Method 2B

The position, extent and species used in riparian planting must be informed by, and be appropriate to, the slope and soil characteristics of the particular environment.

Method 2C

Ngāti Tūwharetoa will work with the regional council to identify water quality targets to ensure the mauri of the wai is protected and enhanced, and the regional council will amend its plans to reflect this.

Method 2D

The Regional Council will amend its plans to prohibit the discharge of wastewater to the Waikato Awa, and provide for land-based treatment and disposal of wastewater.

Method 2E

The Regional Council will review all resource consents for stormwater discharges to the Waikato Awa, and include conditions that require:

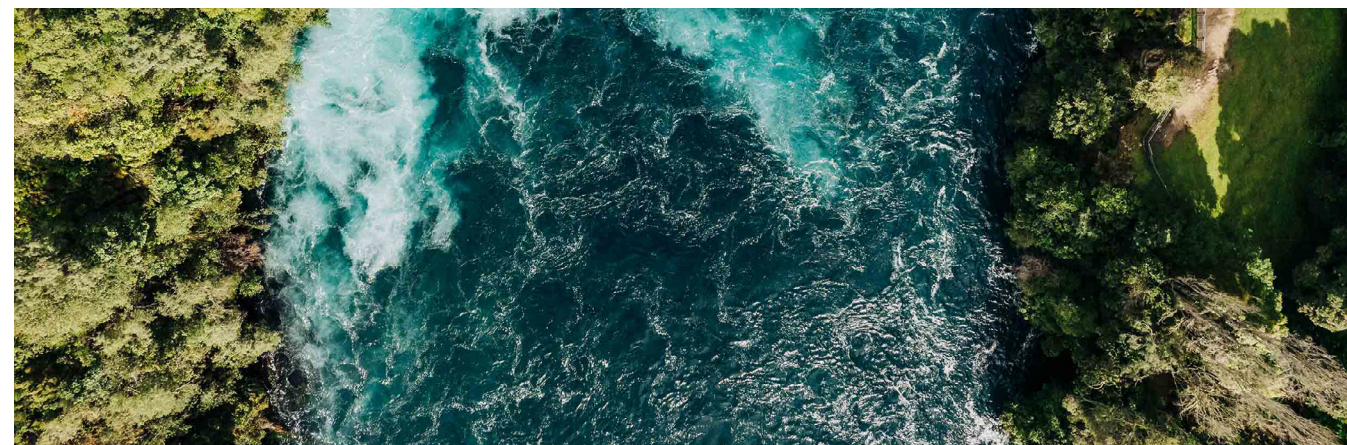
- discharges to water to be hydrologically neutral
- water quality at receiving environments meets the ANZECC Guidelines (or achieves a higher standard, where applicable)
- low-impact design stormwater management (such as wetlands, swales, and ponds) are used to achieve the above, wherever practicable.

Method 2F

Ngāti Tūwharetoa work with councils and landowners to identify and implement culturally appropriate sediment and erosion control measures along the Waikato Awa.

Method 2G

Where the Waikato Awa has been dammed, modified, diverted, channelised or otherwise altered, Ngāti Tūwharetoa work with councils and consent holders to identify opportunities to restore the river to its natural state.



OBJECTIVE 2

Method 2H

When considering resource consents for structures or works in the bed or on the banks of the Waikato Awa, councils will:

- i. prioritise natural and low-impact design options, and
- ii. avoid 'hard' engineering structures where practicable.

Method 2I

Ngāti Tūwharetoa will work with councils to identify opportunities to increase the extent of existing wetlands, and establish new wetlands along the Waikato Awa.

Method 2J

Ngāti Tūwharetoa will work with councils to identify opportunities to remove invasive plant species from the bed, banks and margins of the Waikato Awa.

Method 2K

The Regional Council will review existing resource consents for structures in the Waikato Awa and include conditions that require fish passage to be provided for.

Method 2L

When considering resource consents for structures or works in the Waikato Awa, the regional council will include conditions that require fish passage to be provided for.

Method 2M

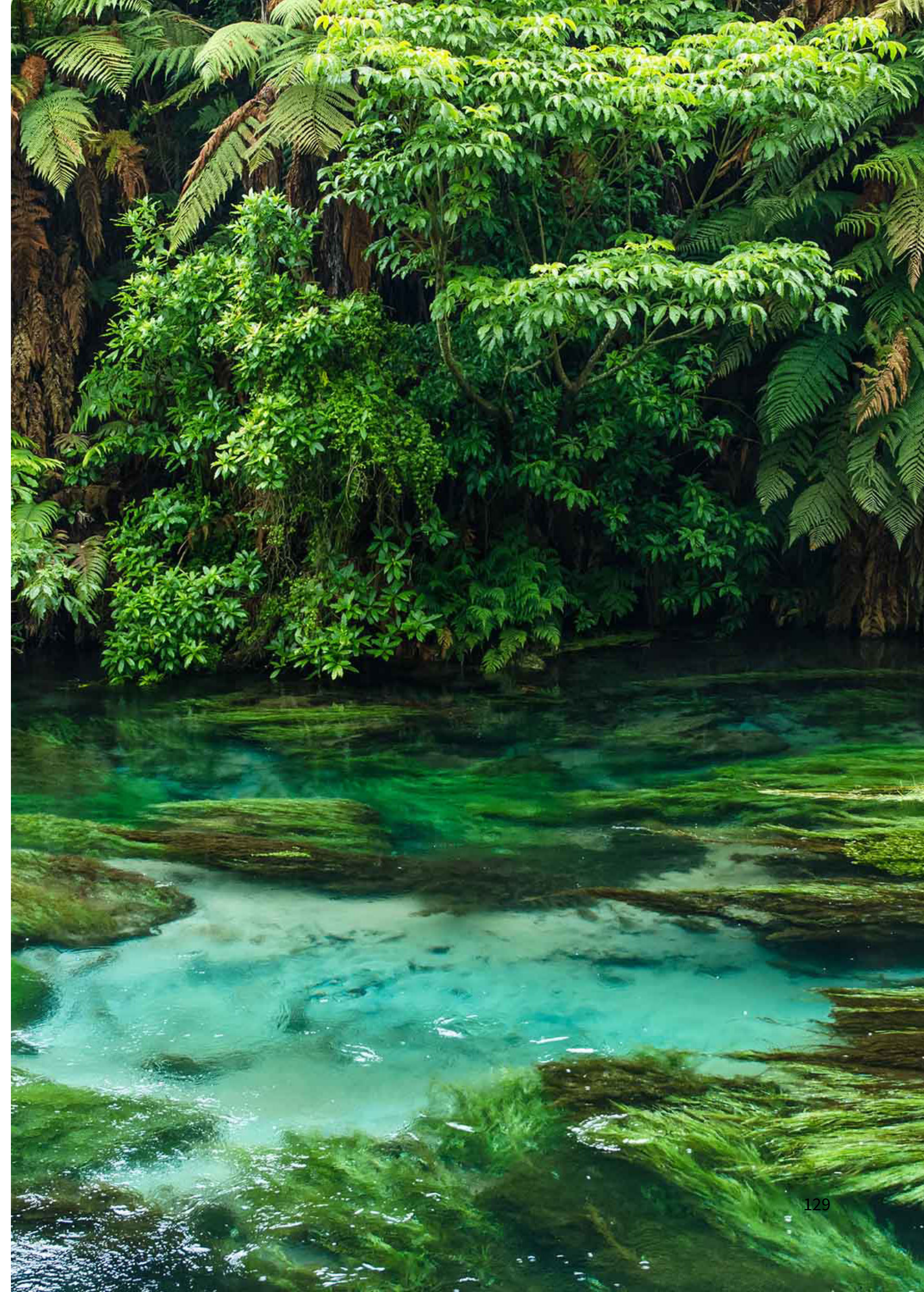
Ngāti Tūwharetoa and Regional Council will undertake fish passage assessments in the Fisheries Area to identify where upgrades are required and work with public agencies and landowners to remove fish passage barriers.

Method 2N

Ngāti Tūwharetoa will work with councils, DOC, MPI and Fish and Game to improve pest management along the Waikato Awa, including by resourcing tangata whenua to carry out surveys, and identify and implement culturally appropriate pest control methods.

Method 2O

Ngāti Tūwharetoa increases the quantity and frequency of eDNA sampling along the Waikato Awa, to build a better understanding of the species present in our fishery.



Objective 3

NGĀTI TŪWHARETOA ARE ABLE TO ACCESS OUR ANCESTRAL WATERS IN TE AWA O WAIKATO

Policy 3.1

There is an abundance of free, safe, widely-known opportunities to access Waikato waterbodies.

Policy 3.2

Public use of waterbodies is prioritised over private and commercial use.

Policy 3.3

Legal and physical access to, along, and within the awa is improved and increased over time.

Policy 3.4

Ngāti Tūwharetoa will have safe, legal and practical access to wāhi tapu and wāhi tūpuna in and around the Waikato Awa.

Method 3A

Council will ensure that public access points to waterbodies are well sign-posted and the public are aware of them.

Method 3B

When the council is considering resource consents for activities on the surface of the water, decisions ensure public access is prioritised.

Method 3C

Regional Council will review the navigation bylaws to ensure safe public access for swimming, fishing and cultural practices are prioritised.

Method 3D

When councils, LINZ, DOC or any other public agency are leasing out public land, they must provide for safe, public access to that land.

Method 3E

Ngāti Tūwharetoa will work with councils to purchase land adjacent to waterbodies to facilitate access.

Method 3F

When the District Council is considering subdivision consents adjacent to waterbodies, they must require esplanade reserves as part of that consent.

Method 3G

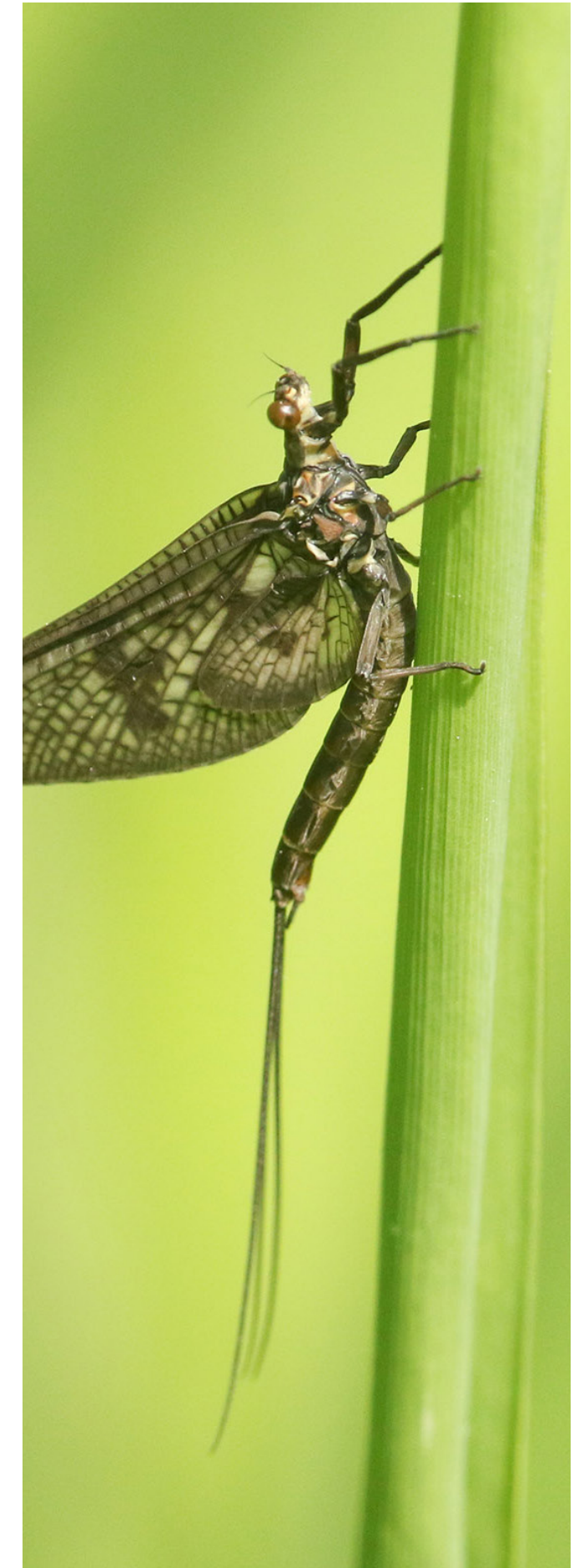
Ngāti Tūwharetoa will partner with landowners to negotiate safe, easy and culturally appropriate access to waterbodies.

Method 3H

The Regional Council will review existing resource consents for activities that affect flow regimes in the Waikato Awa, and include conditions that ensure safe access to significant sites and the ability to undertake cultural and recreational practices.

Method 3I

When considering resource consents for activities that affect flow regimes in the Waikato Awa, the Regional Council will impose conditions that ensure safe access to significant sites and the ability to undertake cultural and recreational practices.



Objective 4

THE NGĀTI TŪWHARETOA CUSTOMARY FISHERY IS PROTECTED AND ENHANCED

Policy 4.1

There is an abundance of habitat for native species in the Ngāti Tūwharetoa fishery.

Policy 4.2

Ngāti Tūwharetoa have a good understanding of the health of our customary fishery.

Policy 4.3

Healthy populations of native species in the Ngāti Tūwharetoa fishery are increased over time.

Policy 4.4

Data on commercial takes of species in the Ngāti Tūwharetoa fishery is recorded and publicly available.

Policy 4.5

Ngāti Tūwharetoa are able to undertake the customary gathering of kai for cultural purposes.



Method 4A

Ngāti Tūwharetoa will investigate the use of by-laws under the Fisheries (Ngāti Tūwharetoa, Raukawa, and Te Arawa River Iwi) Amendment Regulations 2025.

Method 4B

Ngāti Tūwharetoa will monitor species in our fishery, collecting information on population size, species diversity, life cycles, migration and mortality.

Method 4C

Ngāti Tūwharetoa will work with the Regional Council to improve the trap and transfer of migratory species along the Waikato Awa. The Regional Council will provide additional resources and funding to enable trap and transfer to take place at an increased number of sites, and at a greater frequency.

Method 4D

Ngāti Tūwharetoa will work with the Regional Council to undertake monitoring of native species in our fishery, and identify and implement measures and initiatives to restore their health and populations.

Method 4E

Ngāti Tūwharetoa will work with councils, DOC and research institutes to investigate the benefits of captive breeding programmes for native species, for the purpose of:

- i. conservation and restoration
- ii. producing a supply of these species specifically for kai.

Where benefits are shown, these programmes are implemented.

Method 4F

Ngāti Tūwharetoa work with the Regional Council, DOC and Fish and Game to investigate appropriate areas along the Waikato Awa to exclude trout where their presence is proven to have an adverse effect on native species, in order to create refuges for native species.

Method 4G

Ngāti Tūwharetoa will work with the Regional Council, DOC and landowners to identify opportunities to establish pātaka kai.

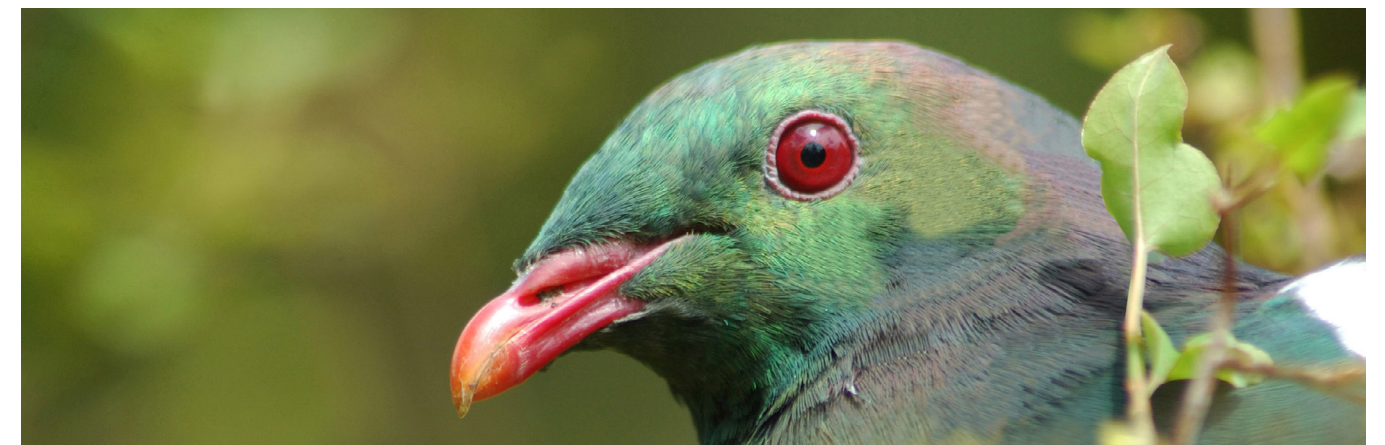
Method 4H

Ngāti Tūwharetoa will work with MPI and commercial fisheries operators, to ensure that adequate, good quality data is collected and made publicly available for all catches.

Method 4I

Ngāti Tūwharetoa will work with Fish and Game to identify and implement measures to ensure that Ngāti Tūwharetoa are able to harvest trout for cultural purposes. This includes:

- i. providing fishing licences at no cost (or at a discounted rate), and
- ii. increasing the daily bag limit for trout.



Objective 5

THE RELATIONSHIP OF NGĀTI TŪWHARETOA WITH THE WAIKATO AWA AND ITS TRIBUTARIES IS RECOGNISED AND PROVIDED FOR

Policy 5.1

The cultural identity of Ngāti Tūwharetoa, and relationship to the Waikato Awa, is visible and celebrated.

Policy 5.2

Ngāti Tūwharetoa are able to undertake traditional practices and customary activities along the Waikato Awa.

Policy 5.3

The mana of the Waikato Awa is upheld and protected.

Policy 5.4

Wāhi tapu and wāhi tūpuna are protected from inappropriate subdivision, land use and development.

Method 5A

Ngāti Tūwharetoa will work with councils to establish signs to educate the public on the presence and importance of the Ngāti Tūwharetoa fishery.

Method 5B

Ngāti Tūwharetoa will work with the District Council to identify where signage, artwork and design can be used to educate and celebrate Te Ao Māori and our connection to the Waikato Awa.

Method 5C

Ngāti Tūwharetoa will work with LINZ to identify and establish processes to reinstate traditional Māori names for tributaries of the Waikato Awa, informed by the advice of Ngāti Tūwharetoa.

Method 5D

Councils will use traditional Māori names for the tributaries of the Waikato Awa and other waterbodies within the rohe, regardless of their legal name.

Method 5E

Ngāti Tūwharetoa will work with councils, landowners, and developers to daylight streams, both named and those with no recorded name.

Method 5F

Ngāti Tūwharetoa will identify and map wāhi tapu, traditional access points, and culturally significant sites.





8 REPORTING

and review

a living doc

This Fisheries Plan is a living document and will be updated as and when needed.

To ensure the delivery of this plan, progress of the implementation of the policies and actions will be assessed and reported on, by Ngā Kaihautū at their monthly hui.

Progress reporting and review will also take place at the Ngāti Tūwharetoa AGM.



9 REFERENCES

our information sources

REFERENCES

This Upper Waikato Fisheries Plan is informed by, and relies on the information, data, knowledge, mātauranga māori, experiences and stories from a number of sources.

These include submissions, books, journal articles, cultural values and cultural impact assessments, historical records, research documents, commissioned assessments, government reports and guidance materials,

Waitangi Tribunal reports, deed of settlement and supporting documents, and resources and records held by Ngāti Tūwharetoa, hapū and marae.

The plan is also informed by kōrero from hui, wananga and site visits that were organised as part of its development.



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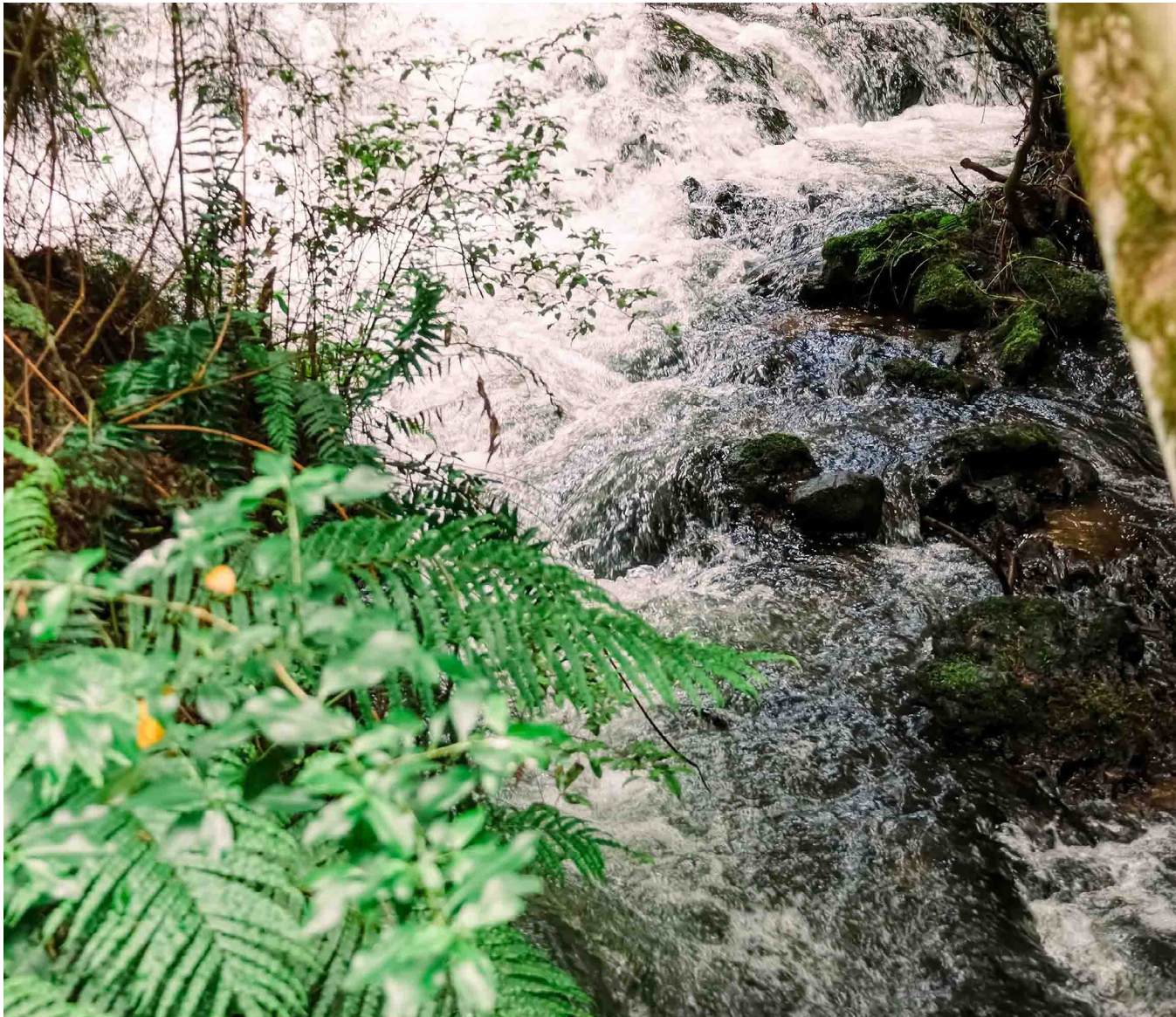
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10 APPENDIX

supporting information

Appendix

Objectives of Te Ture Whaimana

The restoration and protection of the **health and wellbeing** of the Waikato River.

The restoration and protection of the **relationship of Waikato River iwi** according to their tikanga and kawa, with the Waikato River, including their economic, social, cultural and spiritual relationships.

The **integrated, holistic and coordinated** approach to management of the natural, physical, cultural and historic resources of the Waikato River.

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.

The recognition and avoidance of **adverse cumulative effects**, and potential cumulative effects, of activities undertaken both on the Waikato River and within its catchments on the health and wellbeing of the Waikato River.

The recognition that the **Waikato River is degraded** and should not be required to **absorb further degradation** as a result of human activities.

The protection and enhancement of **significant sites, fisheries, flora and fauna**.

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.

The promotion of **improved access** to the Waikato River to better enable sporting, recreational, and **cultural** opportunities.

The application to the above of both **mātauranga Māori** and latest available scientific methods.



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