Te Hā o Te Wai Mārepārepa

"The Breath of the Rippling Waters"

Mauri Monitoring Framework

Pilot Study on the Papanui Stream

Report Prepared for the

Hawke's Bay Regional Council

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(i) Ngā Mihi

Toi tü te Marae a Tane, toi tü te Marae a Tangaroa, toi tü te iwi

If you preserve the integrity of the land (the realm of Tane), and the sea (the realm of Tangaroa), you will preserve the people as well

Ka mihi rā ki ngā marae, ki ngā hapū o Tamatea whānui, e manaaki ana i a Papatūānuku, e tiaki ana i ngā taonga a ō tātau hapu, ō tātau iwi. Ka mihi rā ki ngā mate huhua i roro i te pō. Kei ngā tūpuna, moe mai rā, moe mai rā, moe mai rā. Ki te hunga, nā rātau tēnei rīpoata. Ki ngā kairangahau, ka mihi rā ki a koutou eū mārika nei ki tēnei kaupapa. Tena koutou. Ko te tūmanako, ka ora nei, ka whai kaha ngāwhakatipuranga kei te heke mai, ki te whakatutuki i ngā wawata o kui o koro mā,arā, ka tū rātau hei rangatira mō tēnei whenua. Tena koutou, tena koutou, tena koutou katoa

Thanks to the many Marae, hapū, from the district of Tamatea for their involvement and concerns about the environment and taonga that is very precious to their iwi and hapū. Also acknowledge those tūpuna that have gone before us. Thank and acknowledge the commitment, contribution and support of the people involved in research and document compilation in putting together this report. This report is written in the hope that our Mokopuna and succeeding generations will be able to fully exercise their rights as true kaitiakitanga of Aoteraroa.

Translation of:

"Te Hā o Te Wai Māreparepa" - The breath of the rippling waters

*"This is a reference to **wai** being a living thing. That it can be inflicted with sickness and disease and it requires our attention and care to restore it back to its original form. **Te wai urutapu** is the natural state of water in its most purist form. It is very delicate and vulnerable to contamination. Thus with one teaspoon of sugar we can easily change its state to that of non-pure. Some contamination is much more subtle and we need to carefully listen to **te hā** the breath of the wai to understand the impact of the activity surrounding particular bodies of wai. **Māreparepa** are the ripples on the surface of the **wai**. I was told by my elders that when you throw a stone into the wai that the ripples will move outwards and touch every part of the bank. The strength of water is so great that any contamination, deterioration or loss of water, like the ripples, will touch every part of society, your community, your eco-system, your economy and your own wellbeing."*

(We are grateful to Tipene Heperi for gifting the name and translation)

Acknowledgements

Our team wish to acknowledge the following for providing their aroha, time, support and feedback throughout the pilot study and field trips:

Te Whatuiāpiti Marae and Hapū – Nikora Kupa, James Kenrick, Ian Pene, Erin Sandilands, Pam Kupa-Sheeran, Darryl Miller and to all the whanau who participated in the Wananga and field trips.

Te Rongo-A-Tahu Marae and Hapū – Ahi Heperi, Tipene Heperi, JB Heperi-Smith and to all the whanau who participated in the Wananga and field trip.

Rakautatahi Marae and Hapū – Hiraina Tamihana, June Nepe Apatu and to all the whanau who participated in the Wananga and field trip.

(ii) Executive Summary

Te Hā o Te Wai Mārereparepa meaning the breath of the rippling waters is the name given to the mauri monitoring framework developed through a pilot study commissioned by the Hawke's Bay Regional Council (HBRC). The aim was to develop a mauri monitoring framework which may have universal merit and potential to be useful for other marae and hapū. A research team was formed and led by Brian Gregory (Project Leader), Dr Benita Wakefield (Senior Researcher), Marge Hape (Project Coordinator) and Joanne Heperi (Researcher).

The pilot study was localised to one of the mana whenua marae and hapū located within the Papanui stream sub-catchment: Ngāi Te Whatuiāpiti marae and the hapū is Ngāti Whatuiāpiti Tuturu o Kahungunu. Opportunity was created to also trial the mauri monitoring framework through Te Rongo-A-Tahu marae and hapū.

This kaupapa Māori research project is based in te reo Māori me ona tikanga so that Māori world views and ways of being are acknowledged and validated. The emergence of kaupapa Māori research has encouraged the development of marae, hapū, iwi and community based research approaches which focus on issues of direct importance to Māori. It is essential that Māori develop initiatives for change that are located within distinctly Māori mātauranga – tikanga based frameworks.

Through the pilot study, a conceptual mauri monitoring framework started to emerge, taking shape and form to articulate various indicators identified for each of the four interlinking mauri health states:

- **Te wai urutapu:** refers to the natural state of water in its purest health form. The meaning and significance of the term represents the standards and benchmarks set within Te Ao Māori world views and is articulated through mātauranga. The indicators for this mauri health state will identify the key Māori cultural values of importance to marae and hapū; provide an understanding of the interconnections between the spiritual and natural world; determine bench mark standards for achieving the optimal mauri health state, and seek to develop taonga classifications.
- **Parirau o te mauri:** refers to the changing health state from optimal health to un-wellness or contamination. It recognises rippling shifts and changes in the health state of mauri that can equally, have a rippling effect to all related components. As a result, the whole system is likely to be affected. The transitional mauri indicators include: identifying both historical and contemporary cause-effect relationships changing and shifting the mauri health state; defining the concept of attributes and preference for enhancing mauri based on the issues that are of concern to marae and hapū. It sets the context for determining their goals and management priorities. A holistic approach must be taken to consider the effects on both people and their natural environment most at risk.
- **Te mahi o haurongo:** refers to the action of doing the restorative work. There will be clear and culturally appropriate measures and bench mark standards for improving and enhancing the mauri. The restorative action indicators include: integrative approaches that ensure mātauranga Māori is given equal weighting alongside western-science knowledge and practices; strategic management plans are developed and implemented taking into consideration certain factors (i.e., resources, technology, time, specialist knowledge, skilled workforce etc.).

- **Te Aroturuki Kaupapa:** refers to monitoring for the direction of the programme. Reviewing progress to restore, enhance and to sustain the health state of mauri and well-being of people. Mana whenua may need to re-assess and recognise there are underlying factors. The monitoring indicators include: continually monitoring, reviewing and assessing progress through various integrative approaches which are working towards common goals and realistic outcomes that can be achieved at this time; monitoring and following up on health risks and any other issues arising; maintaining accurate records on data collection; and accepting new goals, measures or priorities that might require new management plans.

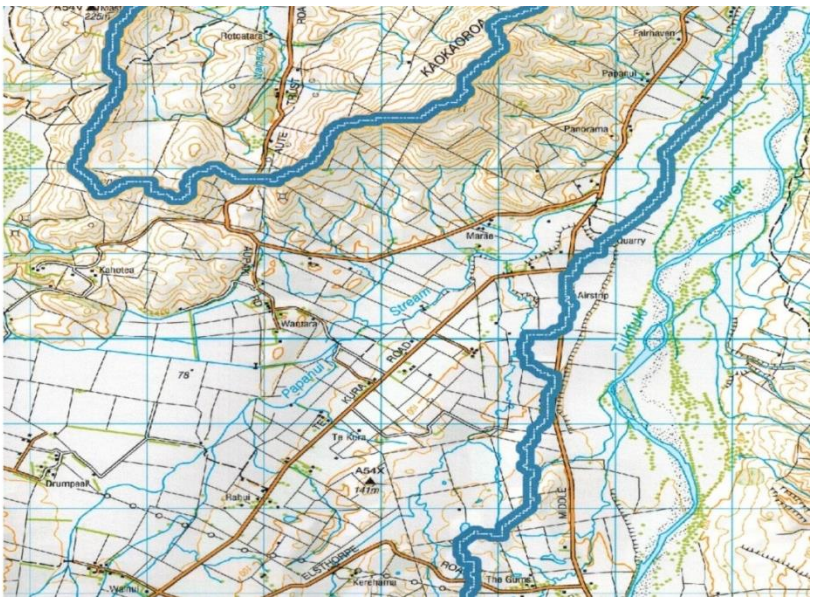
The philosophical underpinnings of 'Te Hā o Te Wai Māreparepa' represents the rippling waters spreading outwards and connecting with everything by its powerful force and might. Implementing the mauri monitoring framework will require the process to have a similar tenacity and potency to influence, energise, and motivate people into action. We have developed a seven step Wai māreparepa process for strengthening whanaungatanga and relationships with people and their natural world that will ensure whanau, marae and hapū have the capacity to achieve their aspirations, goals and visions.

Te Rongo-a-Tahu marae and hapū have been developing a restoration project and there was an opportunity to gain their approval and support to trial the mauri monitoring framework.

In the final section are the conclusions of the pilot study which has sufficient merit and universal appeal for other marae and hapū to be useful. The outcome is a cultural monitoring framework grounded in mātauranga, Māori cultural values providing the mechanism, practises and approaches to support marae and hapū to achieve their goals and aspirations for enhancing and sustaining the mauri life force within freshwater management.

The HBRC commissioned this pilot study in response to the government's reforms being proposed on freshwater management and resource management. Councils will need to manage land use and water in an integrated way and involve Māori marae, hapū and iwi in freshwater decision-making. The mauri monitoring framework has the capacity to be innovative in creating solutions which can integrate alternative approaches, methods and practices to achieve common goals and aspirations.

Figure 0.1 Location map of the Papanui stream



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(iv) Glossary

Aotearoa	New Zealand	*Ariki*	Chief
Atua	Supernatural Gods	*Atua Kaitiaki*	Spiritual Guardians
Awa	River, Lake	*Hapū*	Sub Tribe, Pregnant
Heke	Migration	*Hinengaro*	Mind, Intellect
Hui	Meeting	*Io*	Supreme God
Ira Atua	Spiritual Realm	*Ira Whenua*	Physical Realm
Ira Tangata	World of People	*Iwi*	Tribe
Kai	Food	*Kaitiakitanga*	Guardianship
Kaka	Net	*Karakia*	Prayer, Incantation
Karengo	Sea Weed	*Kaumātua*	Esteemed Elder
Kaupapa	Project	*Kei mua*	Behind
Kei muri	Front	*Kete*	Basket
Kōhanga	Seeding, Nurturing	*Koura*	Crayfish
Maunga	Mountain	*Mahinga Kai*	Food Source
Mana	Dignity, Honor	*Manaakitanga*	Hospitality
Manamotuhake	Authority	*Manawhenua*	Local people
Māori	Indigenous People	*Mara Kai*	Cultivated Areas
Mataitai Kaimoana	Seafood, Shellfish	*Mātauranga*	Traditional Knowledge
Mauri	Life Force	*Mokopuna*	Grandchild
Ngahere	Native bush	*Pakeha*	European
Papatūānuku	Earth Mother	*Rāhui*	Temporary Closure
Rangatira	Chief	*Rohe*	Boundary
Rongoa	Medicinal Herbs	*Takiwā*	Region
Tangata	People, Humanity	*Tangata Whenua*	People of the Land
Taonga Tuku Iho	Treasures	*Tapu*	Sacred, Prohibition
Te Ao Māori	Maori Worldview	*Te Ao Marama*	World of Light
Te Ao Pakeha	Western Worldview	*Te Reo Rangatira*	Maori Language
Tihei Mauriora	Sneeze of Life	*Tikanga*	Protocol, Customs
Tinana	Body	*Tinorangatiratanga*	Self Determination
Tipuna	Ancestor	*Tohunga*	Spiritual Leader
Tūrangawaewae	Footstool	*Urupa*	Burial Site
Wāhi Tapu	Sacred Sites	*Wai*	Water
Wairua	Spirit	*Waka*	Canoe
Wananga	Seminar	*Whakapapa*	Genealogy
Whakataukī	Maori Proverb	*Whānau*	Family
Whanaungatanga	Relationship	*Whenua*	Land, Placenta

1. Overview

1.1 The Papanui stream

The Papanui stream flows through the rohe of mana whenua from the four marae: Mataweka, Tapairu, Pukehou, and Te Whatuiāpiti. The mana whenua are primarily concerned with the protection of cultural values and to improving the mauri of their waterways. This includes the three lakes known as 'Ngā Puna a Tara' within Pukehou, which have been in private ownership for many years. The Papanui stream source flowed from the springs and as an outlet of Lake Roto-a-Tara. Over the years the stream has been modified, re-diverted, narrowed and deepened, and most alarmingly, shrunk in size and water velocity and polluted to the point of being 'mauri-mate (life force is not lost but is virtually non-existent)'. The HBRC acknowledges the Papanui stream now has a 'poor quality' grading.[1]

1.2 Pilot to develop a mauri monitoring framework

In October 2013, the HBRC commissioned Brian Gregory (Project Leader), Dr Benita Wakefield (Senior Researcher), Marge Hape (Project Coordinator) and Joanne Heperi (Researcher),[2] to pilot a research project.

1.2.1 Key aim

The key aim was to develop a mauri monitoring framework with universal merit and potential to be utilised by marae and hapū. A pilot study was established with the approval of the mandated mana whenua marae and hapū located within the Papanui sub-catchment and includes:

- Ngāi Te Whatuiāpiti marae and the hapū is Ngāti Whatuiāpiti Tuturu o Kahungunu;
- Pukehou marae and the hapū are Ngāti Pukututu, Ngāi Te Rangitekahutia, Ngāi Te Hurihangaiterangi and Ngāi Te Whatuiāpiti;
- Mataweka marae and the hapū are Ngāi Te Whatuiāpiti, Toroiwaho, Rangitāne, Te Hauapu;
- Tapairu marae and the hapū is Ngāti Mārau;
- Pourerere marae and the hapū is Ngāi Te Oatua;
- Kahuranaki marae and the hapū is Ngati Rangikoianake.

1.2.2 Objectives

i) To ensure the mauri monitoring framework is culturally appropriate and responsive to Māori perspectives, assessments, and understanding of ecosystems, the natural world.

ii) To investigate mātauranga – tikanga based assessment tools that could be incorporated into the mauri cultural monitoring framework and to trial their usefulness.

iii) To develop a procedure for defining the concept of mauri attributes and preferences that will provide the context for identifying the issues of concern for marae and hapū and to setting goals and management prioritises.

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[1] Te Taiwhenua o Tamatea. (2013). *Cultural Impact Assessment of the Ruataniwha Water Storage Scheme: Addendum Report on Zone M.* Report Prepared for the Hawkes Bay Regional Council. HB.

[2] Hereafter referred to in the report as the 'mauri team.'

iv) To determine integrative approaches that is complementary, holistic and has the capacity to enhance and to sustain the mauri of all natural resources, ecosystems, and the health and wellbeing of people.

v) To articulate a process grounded in kaupapa Māori cultural values, protocols for strengthening whanaungatanga relationships which will ensure Māori aspirations and desired outcomes are achieved.

1.3 Kaupapa Māori approaches

The pilot study was firmly grounded in Māori cultural values, protocols, customs and language so that Māori world views and ways of being are acknowledged and validated. Our approach to this is articulated within kaupapa Māori research. It has been defined as 'the philosophy and practice of being Māori.'[3] There has been an emergence of kaupapa Māori research[4] in Aotearoa over the past 25 years. This has encouraged the development of marae, hapū, iwi and community based research approaches, which focus on issues of direct importance to Māori communities. There is a growing body of literature regarding kaupapa Māori theories and practices that assert a need for Māori to develop initiatives for change that are located within distinctly Māori mātauranga - tikanga based frameworks[5].

1.4 Qualitative methods

Kaupapa Māori principles have guided the development of the research focus to pilot a study on the development of a mauri monitoring framework. The pilot is appropriately localised to mana whenua (mātauranga, traditions and history) marae and hapū located along the Papanui stream. However, the kaupapa Māori approaches and practices developed from the study may have universal merit for other hapū and marae to consider.

1.4.1 Wananga

The study was qualitative, utilising kaupapa Māori tikanga through wananga (formal learning involving activities, workshops, presentations and field trips to particular sites along the Papanui stream). The wananga was videoed and later transcribed for mana whenua participants to review, amend and adjust as required. Copies of the original video tapes and transcripts alongside any notes taken were given to mana whenua.

There were several wananga and hui (i.e., meetings, fieldtrips, presentations) held over the last year outlined below:

- pre-consultation hui held in September/ October 2013;
- wananga held at Tapairu marae on 22 & 23 November 2013;
- consultation hui with Te Whatuiāpiti marae committee held in March 2014;
- wananga held at Te Whatuiāpiti marae on 29 & 30 March 2014;
- consultation hui with Te Whatuiāpiti marae committee held in April 2014;
- field trip site visits with Te Whatuiāpiti whanau on 17 May 2014;

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[3] Smith, G. H. (1992). Tane-nui-a-rangi's legacy: Propping up the sky. Kaupapa Māori as resistance and intervention. Paper presented at NZARE/AARE Joint conference, Deakin University Australia. Published in, *Creating space in institutional settings for Māori*, Auckland: International Research Institute for Māori and Indigenous Education, University of Auckland.

[4] Glover, M. (1997). *Kaupapa Māori health research: A developing discipline.* Paper presented at Hui Whakatipu, Auckland.
Cram, F., Pihama, L. & Barbara, G. P. (2000). *Māori and genetic engineering*. Auckland: International Research Institute for Māori and Indigenous Education.

[5] There are numerous examples referenced in this report to illustrate the evidence of Matauranga –assessment based frameworks emergimg.

- consultation hui with Te Whatuiāpiti marae committee held in June 2014;
- mauri team hui held with Garth Harmsworth and HBRC staff on 4 & 5 July 2014;
- wananga held at Te Whatuiāpiti marae on 13 August 2014;
- field trip site visits with Te Whatuiāpiti whanau held on 29 August 2014;
- consultation hui with Te Whatuiāpiti marae committee held in August 2014;
- field trip site visits with Te Whatuiāpiti whanau held on 19 September 2014;
- field trip site visits with Te Whatuiāpiti whanau on 10 October 2014;
- Mauri team hui with HBRC Helen Codlin on 14 November 2014; and,
- wananga held at Rakautatahi marae on 15 November 2014.

It must be noted that initially wananga was planned be held at all four marae located along the Papanui stream. However, the pilot study was going to extend over a year and it soon became apparent that engaging effectively with all four marae and hapū to trial the four mauri health states, was not going to be realistic. A decision was made in February/ March 2014, to approach Te Whatuiāpiti marae and hapū and to seek their consent for the study to focus specifically on sites located within the Papanui stream flowing through their rohe. Te Whatuiāpiti marae had expressed a strong connection and relationship with the Papanui stream and were keen to be involved in the pilot study. The shift in focus was supported by Tapairu, Mataweka and Pukehou marae who expressed their hope that the mauri monitoring framework to emerge from the study would support their aspirations to restore and enhance the mauri of other waterways within their rohe (i.e., for Tapairu and Mataweka was the Waipawa and Tukituki Rivers and for Pukehou were the three lakes known as 'Ngā Puna a Tara').

The mauri team held the final wananga at Rakautatahi marae to assist the HBRC in linking the Papanui stream project with the Porangahau stream project as part of Plan 6 (currently the project is in its developmental stage). Members of the mauri team were also involved in another project through the Ngā Whenua Rahui fund from the Ministry of Conservation, to improve the mauri of the Porangahau stream and had been trialling aspects of the pilot study.

1.4.2 Key participant interviews, documentation

There were semi structured interviews held with Kaumatua, mana whenua and other participants associated with each wananga. These interviews were digitally recorded and transcripts were produced for whanau to comment, amend and make any adjustments. We also accessed literature through public documents, reports, internet and Māori manuscripts. All the data was collated and written into progress reports and the final report, produced for the HBRC.

1.4.3 Advisory

In the last year, members of the mauri team have been reporting to other groups (ie, Te Taiwhenua O Tamatea, the steering group formed for the Papanui stream, Te Whatuiāpiti marae committee, Kaumatua), for feedback, advice, transparency and accountability.

Throughout the length of the pilot study, the mauri team had solicited the support of Garth Harmsworth, a well-respected Māori environmental scientist with many years of experience and expertise within freshwater. Garth had been working closely with Dr Benita Wakefield on a number of marae and hapū initiated freshwater projects to improve the mauri of several waterways within Tamatea (Central Hawke's Bay). Garth attended most of the wananga and facilitated an 'in-house mauri team debrief hui' held mid-way through the pilot study to evaluate progress on the development of the mauri monitoring framework.

Garth was very generous and forthcoming in sharing his knowledge and expertise within fresh water management. Garth (and his other colleagues within Manaaki Whenua, notably Dr Shaun Awatere) have accumulated a critical mass of research around mātauranga - tikanga based assessment models. They have also articulated and advocated for Treaty-based collaborative management partnerships which give equal weighting to Māori aspirations, approaches and ways of knowing with science knowledge and approaches. Garth agreed to co - author the final report with the other members of the mauri team and has certainly influenced the shape and form of the mauri monitoring framework to emerge.

1.5 Wai māreparepa process

The philosophical underpinnings of 'Te Hā o Te Wai Māreparepa' represents the rippling waters spreading outwards and connecting with everything by its powerful force and might. Implementing the mauri monitoring framework will require the process to have a similar tenacity and potency to influence, energise, and motivate people into action. The Wai māreparepa process[6] for strengthening whanaungatanga and relationships with people and their natural world will ensure whanau; marae and hapū have the capacity to achieve their aspirations, goals and visions. There are seven steps outlined below:

Whaka mihi: – acknowledgement is given to the mana whenua **who** are connected to the whenua, awa **where** the proposed research study is likely to be located. This first phase will identify the mandated mana whenua to gain their consent and approval or rites of passage to heal and restore the mauri.

Whaka karakia: - affirming through whakapapa the inter-connections between the spiritual realm and the natural world. This phase recognises **how** mana whenua are intimately intertwined with their natural world articulated through mātauranga localised to their place of belonging, tūrangawaewae.

Whaka puaki: – recognising **why** mana whenua have reciprocal responsibilities as the kaitiaki to protect, enhance and to sustain the mauri, life force capacity of all living things, taonga. This phase requires attentive listening, sensitivity and understanding of **what** the concerns and issues are for mana whenua.

Whaka tangi: – giving full expression or voice to the emotional, spiritual, social, mental and physical dimensions – embodied in the four corner stone structure of a house[7] that can be weakened when one dimension shifts or changes. This phase must ensure a holistic approach to understand **how** the diminishing mauri life force is inter-twined with the health and wellbeing of people.

Whaka rata: – represents a meditative, thoughtful, contemplative time for mana whenua. This phase requires time to consider carefully and to make informed decisions on **what** the plan for change will involve by accessing the collective wellspring of wisdom, gathering information, guidance, grounded in Te Ao Māori, mātauranga, tikanga.

Whaka hohourongo: – mana whenua take decisive action that might include reconciliatory, remedial, corrective measures. This phase allows opportunity to form collaborations and integrative approaches, values and perspectives that will support the desired outcomes being sought.

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[6] The stages have been adapted from the Poutama model developed by Paraire Huata in the 1990s as part of Te Ngaru Learning programme.

[7] Reflecting the four dimensions of Te Whare Tapa Whā health model developed in the 1980s.
Durie, M. (1998). *Whaiora: Māori health development* (2nd ed.). Auckland: Oxford University Press.

Whaka oho: – There is a recognition of the positive changes towards (or away from) the desired outcomes sought. In this phase lessons are learnt, a reality check on the current situation is reviewed to reveal a time to modify or alter the direction or action which might mean that new goals are established to start the seven step process again (articulating the where, what, why, how, when).

Figure 1.1 Location of Te Whatuiāpiti marae

Next is an outline of section two on the mauri monitoring framework.

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2. Outline of the Mauri Monitoring Framework[8]

2.1 Introduction

Through the pilot study, a conceptual mauri monitoring framework started to emerge, taking shape and form to articulate various indicators identified for each of the four interlinking mauri health states:

- **Te wai urutapu:** refers to the natural state of water in its purest health form. The meaning and significance of the term represents the standards and benchmarks set within Te Ao Māori world views and is articulated through mātauranga. The indicators for this mauri health state will identify the key Māori cultural values of importance to marae and hapū; provide an understanding of the interconnections between the spiritual and natural world; determine bench mark standards for achieving the optimal mauri health state, and seek to develop taonga classifications.
- **Parirau o te mauri:** refers to the changing health state from optimal health to un-wellness or contamination. It recognises rippling shifts and changes in the health state of mauri that can equally, have a rippling effect to all related components. As a result, the whole system is likely to be affected. The transitional mauri indicators include: identifying both historical and contemporary cause-effect relationships changing and shifting the mauri health state; defining the concept of attributes and preference for enhancing mauri based on the issues that are of concern to marae and hapū. It sets the context for determining their goals and management priorities. A holistic approach must be taken to consider the effects on both people and their natural environment most at risk.
- **Te mahi o haurongo:** refers to the action of doing the restorative work. There will be clear and culturally appropriate measures and bench mark standards for improving and enhancing the mauri. The restorative action indicators include: integrative approaches that ensure mātauranga Māori is given equal weighting alongside western-science knowledge and practices; strategic management plans are developed and implemented taking into consideration certain factors (i.e., resources, technology, time, specialist knowledge, skilled workforce etc.).
- **Te Aroturuki Kaupapa:** refers to monitoring for the direction of the programme. Reviewing progress to restore, enhance and to sustain the health state of mauri and well-being of people. Mana whenua may need to re-assess and recognise there are underlying factors. The monitoring indicators include: continually monitoring, reviewing and assessing progress through various integrative approaches which are working towards common goals and realistic outcomes that can be achieved at this time; monitoring and following up on health risks and any other issues arising; maintaining accurate records on data collection; and accepting new goals, measures or priorities that might require new management plans.

[8] The mauri monitoring framework has been adapted from the Haumanu Taiao Ihumanea framework developed in collaboration with Ngati Kuri hapū, Ngai Tahu and Dr Benita Wakefield which spanned 10 years in its inception, development, implementation and eventually, the focus of a co - authored PhD.

Wakefield B.W & Kahu. M. (2008). *Haumanu Taiao Ihumanea: Collaboration study with Te Tai O Marokura.* PhD. Lincoln University.

The following sections of the report are outlined below:

3. First mauri health state: Te Ao Māori, mātauranga, tikanga (Part A) and the pilot study (Part B);
4. Second mauri health state phase two: shifting and changing the health state of mauri (Part A) and the pilot study (Part B);
5. Third mauri health state: remedial action plans informed by mātauranga (Part A) and the pilot study (Part B);
6 Fourth mauri health state: reviewing progress to restore and enhance the mauri (Part A) and the pilot study (Part B);
7. Application of the pilot study to Te Rongo-a-Tahu marae and hapū; and,
8. Conclusions of the pilot study.

Next is the section outlining the first mauri health state.

3. Te Wai Urutapu: The First Mauri Health State

3.1 Introduction (Part A)

Te wai urutapu represents the natural state of water in its purest health form. The first mauri health state provides an understanding of the inter-relationships between Māori and their natural world articulated through mātauranga Māori, traditions, oral histories and creative narratives. Other core Māori values and key environmental concepts are described which form the basis for the Māori perspectives, assessments, and understanding of ecosystems, the natural world. Finally, mātauranga indicators identified for the first mauri health state are outlined.

3.2 Te Ao Māori

Te Ao Māori, Māori world view of creation narratives provides an explanation and understanding of the inter-relationships between Māori and their natural world. A central tenet of the Māori world view is whakapapa literally translated as laying one thing upon another, the genealogical descent of all living things. Māori views of 'time past' is associated with the front (kei mua), of mātauranga, traditional knowledge passed down through the generations providing the source of inspiration and creativity. Notions of 'time future' lie behind (kei muri) and where the potential of all living things is yet to be realised.

Whakapapa between the supernatural realm and the natural world are both part of a unified whole. There is a distinctive unifying, infinite life force inherent within all living things connecting everything within each other, the universe and creation. This infinite life force is commonly referred to as the **mauri** manifest in the natural world with its source from the supernatural, spiritual realm.

3.3 Mātauranga

The term has many definitions that cover belief systems, epistemologies, values, and knowledge both in a traditional and contemporary sense. Mātauranga Māori can be defined as the knowledge, comprehension or understanding of everything visible and invisible existing in the universe.[9]

The concept of mātauranga has been defined in reports such as WAI 262.[10] The Wai 262 claim defined mātauranga Māori as "the unique Māori way of viewing the world, encompassing both traditional knowledge and culture." Through this claim, the claimants were seeking to preserve their culture and identity, and the relationships from which their culture and identity are derived. Mātauranga Māori, which involves observing, experiencing, studying, and understanding the world from a Māori cultural perspective, is often equated with wisdom.

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[9] Best, E. (1942). *Forest law of the Māori*. Wellington, Dominion Museum.
Buck, P. (1950). *The coming of the Māori, by Te Rangi Hiroa*. Wellington, Māori Purposes Fund Board.
Marsden, M. & King, M. (1975). *God, man and universe: a Māori view Te Ao Hurihuri: the world moves on*. Wellington, Hicks Smith & Sons. Pp. 191–219.
Mead, H. M. & Grove, N. (2001). *Ngā pepeha a ngā Tipuna*. Wellington, Victoria University Press.
Mead, H. M. (2003). *Tikanga Māori: living by Māori values*. Wellington, Huia Publishers.
Ngā Kaitūhono. (2012). *Conversations on Mātauranga Māori.* Wellington, New Zealand Qualifications Authority.

[10] Waitangi Tribunal. (2011). *Report of the Waitangi Tribunal on Indigenous Flora and Fauna and Cultural Intellectual Property Claim (Wai 262).* Wellington, Waitangi Tribunal.

Mātauranga Māori recognises the inter-relatedness and connections of all living things and provides a context for articulating localised tribal traditions, oral histories and cultural values.

The extent to which changes have occurred in the way Māori now view the world from the way of their ancestors can utilise mātauranga Māori in a contemporary context to analyse and consider aspects of our modern world in order that alternative approaches, new ways of being and thinking might need to be constructed. Mātauranga Māori in the form of creation narratives offers a philosophical explanation from which a conceptual mātauranga - tikanga based monitoring framework can be developed to articulate how the balance might be restored to improve, to enhance and to sustain the mauri, life force capacity of all living things.

3.4 Core Māori values

Many holistic planning frameworks based on mātauranga Māori, tikanga, and Māori values have emerged since 1990. The mauri monitoring framework we have developed has the potential to synthesise mātauranga Māori and science together to monitor culture and the environment. Core Māori values form the basis for this framework which is determined by mana whenua to make sense of, experience and to articulate in a way which fully expresses their intimate connection with the spiritual and natural world.

Cultural values are embedded in Te Ao Māori and provide the concepts, principles and lore, Māori are likely to use in everyday life (in varying degrees) to form the tikanga. They can be exercised through kaitiakitanga responsibilities strengthening their connections and relationship to the natural world. Māori values can therefore provide a basis to identify what is valued, a geographic reference or spatio-temporal context of that value, and the information to establish what is significant and how to prioritise such values (ie, natural resources, soils, significant cultural sites, significant biodiversity habitats and species, iconic cultural flora and fauna species).[11]

3.5 Key Māori environmental concepts

Māori environmental concepts[12] are derived from Māori values and mātauranga Māori. They form the basis for Māori perspectives, assessments, and understanding of ecosystems.

Some of the key environmental concepts are:

- Whakapapa – The connection, lineage, or genealogy between humans and ecosystems and all flora and fauna. Māori seek to understand the total environment or system and its connections through whakapapa. Their perspective is holistic and integrated.
- Kaitiakitanga – sustainable resource management, an active rather than passive relationship with the natural environment.

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[11] Awatere, S. & Harmsworth, G. (2014). *Ngā Aroturukitanga tika mō ngā Kaitiaki: Summary review of mātauranga Māori frameworks, approaches, and culturally appropriate monitoring tools for management of mahinga kai*. Report prepared for the University of Waikato.

[12] Marsden, M. (1989). *Resource management law reform: Part A, the natural world and natural resources, Māori value systems & perspectives, Part B, water resources and the Kai Tahu claim*. Wellington, Ministry for the Environment.
Barlow, C. (1991). *Tikanga whakaaro: key concepts in Māori culture*. Auckland, Oxford University Press.
Kawharu, M. (2000). Kaitiakitanga: a Māori anthropological perspective of the Māori socio-environmental ethic of resource management. In, *Journal of the Polynesian Society*. 109(4): 349–370.
Harmsworth, G., Dixon, L. & Awatere, S. (2011). Review paper*: Improved reporting tools – Māori cultural monitoring approaches throughout Aotearoa*. Lincoln, Landcare Research.

- Mana – having authority or control over the management of natural resources.
- Ki uta ki tai – a whole of landscape approach, understanding and managing interconnected resources and ecosystems from the mountains to the sea (the Māori concept of integrated catchment management).
- Taonga tuku iho – intergenerational protection of highly valued taonga passed from one generation to the next in a caring and respectful manner.
- Te Ao Tūroa – intergenerational concept of resource sustainability.
- Mauri – an internal energy or life force derived from whakapapa, an essential essence or element sustaining all forms of life. Mauri provides life and energy to all living things, and is the binding force that links the physical to the spiritual worlds (ie, wairua). It denotes a health and spirit that permeate all living and non-living things. All plants, animals, water, and soil possess mauri. Damage or contamination to the environment is therefore damage to or loss of mauri.
- Ritenga – the area of customs, protocols, laws that regulate action and behaviour related both to the physical environment and to people. Ritenga includes concepts such as tapu, rāhui, and noa, which were practical rules to sustain the well-being of people, communities, and natural resources. Everything was balanced between regulated and deregulated states where tapu was sacred, rāhui was restricted, and noa was relaxed or unrestricted access.
- Wairua, Wairuatanga – the spiritual dimension, a spiritual energy and dimension as a concept for Māori well-being.

3.6 Describing mātauranga indicators

The first mauri health state seeks to describe the following mātauranga indicators:

- Identity of key Māori cultural values, mātauranga of importance to mana whenua.
- Understanding the inter-connections of Māori with their natural world.
- The capacity to establish the bench mark and standards for achieving the optimal mauri health state.
- Developing taonga classifications (i.e., utilising the ki uta ki tai concept) and itinerary list.

Pilot Study on the Papanui stream for the first mauri health state

3.7 Introduction (Part B)

The first mauri health state is applied to the pilot study on the Papanui stream to introduce the mana whenua: – Te Whatuiāpiti marae and hapū. There is a discussion on the cultural values of importance to mana whenua reflecting their perceptions, understanding and connections to the spiritual and natural world.

For the Wai māreparepa process there is an outline of whaka mihi and whaka karakia.

Pepeha

Ko Kauahehei te maunga

Ko Papanui te awa

Ko Whatuiāpiti te marae

Ko Takitimu te waka

Ko Ngai Te Whatuiāpiti raua ko Ngati Kahungunu nga iwi

Kauahehei is the mountain

Papanui is the stream

Whatuiāpiti is the marae

Takitimu is the waka

Ngai Te Whatuiāpiti and Ngati Kahungunu are the tribes

Figure 3.1 Images of the marae

3.8 Te Whatuiāpiti marae and hapū relationship to the Papanui stream

Wai māreparepa - whaka mihi: process of acknowledgement is given to the mana whenua **who** are connected to the whenua, awa **where** the pilot study is located. Approval and support is obtained and mana whenua are involved in establishing shared goals and desired outcomes.

A pre-consultation series of hui was held with mana whenua from the four marae and hapū located along the Papanui stream to discuss the proposed mauri pilot study and to gain their consent and support to develop a mauri monitoring framework for the Papanui stream. It was important to involve mana whenua to ensure their aspirations and vision for the Papanui stream was incorporated into the desired outcomes being sought which was to improve, enhance and to sustain the mauri.

The pilot study was refined to the rohe of Te Whatuiāpiti marae and at the first wananga held with whanau there was a discussion on cultural values and their relationship to the Papanui stream.

3.9 Ngā Atua

Wai māreparepa - whaka karakia: process affirms whakapapa inter-connections between the spiritual realm and the natural world. This phase recognises **how** mana whenua are intimately intertwined with their natural world articulated through mātauranga localised to their place of belonging, tūrangawaewae.

Mana whenua expressed their connections to the spiritual realm of Ngā Atua:

> *Who is the guardian of the water – Hinewai. All those plants you see in there, the rimurimu…The turrets and shells you find in there are Parawhenuamea, the Atua of all deluge. So when there is flooding she takes the food from Papatūānuku and Tane and Tuparemaunga and flushes it all out to feed her children in the sea as well as in the rivers. She's trying to feed her children the pāua, the kina, the pūpū those are all her children, and the rimurimu that's in the sea, as well as the waitai and the waiMāori as well. Flooding is a good thing; it flushes all this 'nutrients in here out to sea. The Para is all the nutrients off the land. Parawhenuamea married Kiwa who is Tane and Tangaroa's brother. And he's in charge of Moana-nui-a-kiwa which is the sea. Takatowai is part of Parawhenuamea too. Takatowai married Tuamatua and had Rākāhore which is all the stones. Takatowai the mother is all the stuff that goes through all the rocks, it seeps through the stones, touches all the rocks and stones. She's actually the moisture that goes through the land and cleans out the land as well and comes into the waterways, so by the time it reaches the waterways it's been through all her children. She married Tuamatua, the eldest of Tanes children….There used to be Patiki in here* [Papanui stream by the bridge on Te Aute Rd] *, the Patiki I know are the Maoka, not the sea Maoka but the spotted ones, and they are much nicer. Same type so Tangaroa is here too. Kiwa is here because of Parawhenuamea. But he also married Hinemoana. Hinemoana is from the sea but her children came up here too in the Keawai. The keawai are the freshwater crayfish. Parawhenuamea and Kiwa are the Kakahi, the bivalves, little mussels and whatever. The Moreana, that's Tangaroa. They're the goldfish, carp, and bony things but lovely bottled. Tangaroa's also the mokomoko, the lizards here.*

Table 3. 1: (below) provides an outline of the Ngā Atua related to each domain and examples of their attributes to mauri.

Table 3. 1: Ngā Atua domains and attributes to mauri

Ngā Atua Domains	**Examples: Ngā Atua**	**Examples: Attributes to Mauri**
Tane	Tuatea, Tuauri, Aronui	- the three kete of knowledge, light, darkness, pursuit
	Whatukura:Rehutai, Hukatai	- Sacred stones that hold the mauri of freshwater Different gravel and flora growing off the rocks
	Rākāhore	- Coastal cliffs Rocks that separate earth (Papa and Wainuatea)
	Tini o Poto	- Insects
	Parawhenuamea	- The Para – refers to all the vegetation that comes off the mountains
Tangaroa	Hinetutehoanga	- The rocks, sand and stones mainly found in the sea
	Hinetuakiri	
	Hinonepu	
	Takatowai	- Fresh water
	Arawaru	- Kuku, pipi, kākahi (two shell)
	Kaianga	- Pāua, pūpū (one shell)
	Parawhenuamea	- Are all the nutrients from the vegetation on the mountains that goes into the rivers feeding the invertebrates etc
	Ihorangi	- Guardian of all the fish
	Hinemoana	- Guardian of all the sea weed
	Hinewai	- Guardian of freshwater
Tumatauenga	Tini o Peketua	- Different types of scourges (i.e., plagues)
	Wahi tapu	- Sacred sites(i.e., healing springs, areas for special rituals)
	Pa kainga	- Settlements, village
Tawhirimatea	Tini O Raumano	- Different types of winds
	Ihorangi	- Rain and snow
	Ngā momo ua katoa	- Different types of rain
	Tutekapua	- Different types of cloud
	Hinepukohurangi	- Guardian providing a protective barrier (ie, mist, dew)
Ruaumoko		- Earthquakes and volcanos
Haumiatiketike	Aruhe	- Fern root
	Kōwaowao	- Hounds tongue fern
	Mouku	- Henning chickens fern
	Huruhuruwhenua	- Shining spleen wart
	Puha	- Spinach
Rongomātane	Kumara	- Sweet potato
	Taewa (Riwai): Tutaekuri	- Māori potatoes

3.10 Core cultural values

There were core cultural values articulated by whanau and examples are given below on kaitiakitanga, mahinga kai, mātauranga:

> *There are the little weenie turret shell things - Parawhenuamea, and the little bivalves, the little mussels. They usually grow and we see them on the weed that flows in the river. Our kokopu would feed from that weed as well and the eels flow through it. You kill that [*the Parawhenuamea and] *you kill everything else in it…How do you know when it's a good time to get a nice eel? The moon, certain animal behaviour, insect behaviour, our cloud formation shows us when –* [mātauranga] *which has been handed down from generation to generation.*
>
> *We talk about how the Atua talk, and if we bring all those Atua into perspective as to how they communicate, it's through these plants, it's through the insect behaviour, the cloud formations, the moon etc.…They all have a mauri and it all connects. We are Kaitiaki of everything! We are the generation that has to find this tool, and we have to work together. That's my understandings and my view of the waterways. And when it comes to the tuna - the cycle of that eel out to sea and comes back making it's way back up our streams, and they can travel overland. And so the Atua, when I hear the Atua being explained and the mauri behind it and how they connect and talk - then I look at the scientific research point of view and the Atua perspective, they're actually doing the same thing.*
>
> *Pou-tahi is the first stage and the Atua for our Pou-Tahi is Papatuānuku. There is the mātauranga side we learn; there is the Atua in terms of Papatuānuku, Io and the creation of the universe - Te Kore, Te Pō, Te Ao. What we need to remember is Te Kore, Te Pō; Te Ao is something that happens all the time. We go from a state of confusion, through to Te Ao Marama. In terms of our mātauranga Māori, having a deeper understanding of mātauranga Māori gives us a deeper understanding of our world view and when we talk about our world view, it comes from Io…Tane and the kete of knowledge that he brought to this physical world that we live in. In terms of our knowledge, how it was handed down, our tipuna personified things. When we talk about Io who gave the mauri, every living thing has a mauri, a rock or kōhatu, our people know that has a mauri, and if that mauri dies, the rock or the kōhatu disintegrates. So we know that everything has a tangible life force.*

Ki uta ki tai – represents a whole-of-landscape approach, understanding and managing interconnected resources, ecosystems, taonga species - a Māori perspective of integrated catchment management. Table 3.2 (below) provides examples of mātauranga: taonga tuku iho from the mountains to the sea.

Table 3. 2: Examples of taonga species list (Ki uta ki tai – mountains to the sea)

Maunga	Ngahere	Awa	Ngā Ika
Kauhehei Pukehou Kahuranaki Kauhehei Ngā Kaihinaki Pukeiti Pukekaihau	Tipu Aruhe Harakeke Kiekie Puha Manu: Kākāpō Kakī Tui Piwakawaka Rakau: Akatorotoro Kahikatea	Tukituki Waipawa Papanui Te Roto a Tara Te Roto a Kiwa Te Roto a Poukawa Puna Wai	Tuna Patiki Inanga Koura Kokopu Kaeo Paraki Waikoura

3.11 Feedback from whanau for the first mauri health state

- The conversations shared by whanau on mātauranga was very interesting and enlightening with many appreciating the learning on Ngā Atua Kaitiaki.
- It was important for the mana whenua of Te Whatuiāpiti marae and hapū to identify mātauranga that was embedded in their history and relationship to the Papanui stream.
- The whanau participating in the wananga had felt their wairua, wellbeing and whanaungatanga – connection to the awa and to each other, had been strengthened.
- The whanau enjoyed the field trips to the wahi tapu sites and the stories shared at the bridge (like the kaitiaki wahine guarding the area).
- Whanau were excited to be involved in the pilot and were looking forward to more wananga on mauri.
- The wananga had raised people's awareness on the standards and benchmarks needing to be set for restoring the mauri to its most pristine health state.
- Whanau commented on the Wai Māreparepa process of whaka mihi and appreciated the mauri team engaging with the marae and hapū from the beginning of the pilot study and the opportunity for whanau to strengthen relationships with their awa and with each other.

Figure 3.2 Te Whatuiāpiti whanau and the bridge on the Papanui stream

Next is the section outlining the second mauri health state.

4. Parirau o Te Mauri: Second Mauri Health State

4.1 Introduction (Part A)

Parirau o te mauri refers to the shifts and changes in the mauri health of immediately related components. As a result, the whole system is eventually affected. A holistic approach must be taken to understand how shifts and changes in the mauri state can impact on the health of people. This holistic approach is used to identify where a problem originates and to determine what is or is not achievable, in practical terms. We use taonga wai to provide an illustration of how Māori understood and classified the changing mauri health states of wai and were able to identify their key issues and concerns. Finally the transitional indicators for this health state are outlined.

4.2 Transitional shifts in mauri life force, life vitality

Traditionally, all activities and relationships were bound and governed by tapu, mana and noa governed by an elaborate system of ritenga. The process used by Māori to guide resource use reflected this belief in the interrelationship of all parts of the environment. Within a more contemporary context there have been significant shifts and changes in the health state of mauri. There are cause and effects on the environment and health of Māori which has disrupted the balance of the whole system.

4.3 Holistic approach

A framework based on mātauranga Māori concepts could ensure agreed aspirations or outcomes to restore the mauri. A set of principles and practices to maintain the goal of mauri maintenance often recognises four health states:

- taha tinana – a material state, the body;
- taha hinengaro – a mental state;
- taha wairua – a spiritual state; and,
- taha whanaungatanga – a related or associative state.

There are many variations of these concepts. Taken together, these health states help Māori understand the natural environment in a very holistic sense. They also provide a balanced perspective of the world. The first state, tinana, is what we are exposed to through our senses, smell, touch, vision, and hearing. The second state, hinengaro, is the mental state of improving knowledge and understanding, and thinking holistically about the natural environment, based on the premise that everything is interconnected and that thinking has to be able to understand the complete picture. The third state, wairua, is spiritual. It is strongly tied with people's values, relationships, beliefs, attitudes, and feelings about a place or the natural environment as a whole. The final state, whanaungatanga, emphasises association with the natural environment, and the relationships between people. This state is critical for understanding the relationship between people and the natural environment, learning from a long period of co-existence with the natural environment, and understanding the effect human activities have on the environment.[13]

[13] Awatere, S & Harmsworth, G. (2014). *Ngā Aroturukitanga tika mō ngā Kaitiaki*: Summary review of mātauranga Māori frameworks, approaches, and culturally appropriate monitoring tools for management of mahinga kai.

4.4 Wai, water health states of the mauri

From the first mauri health state the bench mark or standard is established through mātauranga, of taonga classifications (ie, ki uta ki tai), to understand, communicate knowledge about, regulate, restrict, and manage parts of their natural and spiritual environment. These have been represented through an understanding of cultural values.

In respect to water, this taonga is useful to illustrate how well Māori fully understood that water was a fundamental requirement for survival, and were conscious of the links between water and its mauri health state. Mātauranga gathered on the different classification of taonga wai within the first mauri health state recognised there were several degrees of water purity and that separate sources of water were used for different purposes. Mātauranga, traditional knowledge on taonga wai has been adapted to reflect the shifts and changes to the mauri health state of wai in more contemporary times:[14]

Wāhi tapu – traditionally referred to sites or places of ritual constraint or prohibition. Waahi tapu has been defined as a place sacred to Māori in the traditional, spiritual, religious, or mythological sense and generally used to acknowledge sacred sites.

Wāhi taonga – Often includes sites of importance, including pa sites, tracks, kainga, marae, rock carvings, mahinga kai, cave areas, archaeological sites, tohu, traditional occupation sites, rock formations, significant stands of forest or trees, etc.

Urupā – burial sites.

Mahinga kai – areas and locations where food of any sort is gathered, grown or hunted, including forests, swamps, lakes, rivers, cultivatable soils, etc.

Waiora – is the purest form of water, such as rainwater. It is the spiritual and physical expression of Ranginui's (sky father) long desire to be reunited with Papatūānuku (earth mother). Pure water is termed "te waiora a tane" and to Māori it contains the source of life and well-being. Contact with Papatūānuku gives it the purity as water for human consumption and for ritual. Traditional water could only remain pure without being mixed and was protected by ritual prayer. Traditionally waiora had the potential to give life, sustain well-being, and counteract evil.

Waitohi – areas of pure water.

Waitapu – sacred water used in rituals. Rituals used running water, sometimes termed wai matua o Taupapa (virgin water as it flows from the earth). Water was applied using certain plants, not human-made vessels.

Waipuna – generally pure spring water that comes from the ground (eg, hillside or underground springs).

Wai Māori – water becomes wai Māori when it comes into unprotected contact with human beings (eg, running streams, lakes). It therefore becomes normal, usual or ordinary, and no longer has any particularly sacred associations. Wai Māori is often used to describe water that is running or unrestrained, or water that is clear or lucid. Wai Māori has a mauri (which is generally benevolent) and was controlled by ritual.

Waitai – used to describe any water that is tidal, influenced or related to the sea (the domain of Tangaroa) and includes waves, surf, estuaries, tidal channels, river mouths

[14] Douglas E.M.K. (1984). *Waiora, Waikino, Waimate, Waitai: Māori perceptions of water and the environment*. Hamilton, Centre for Māori Studies and Research, University of Waikato.

(eg, salt water). It is used to distinguish seawater from fresh water (wai Māori, waiora). Waitai was water returned to Tangaroa. Māori often thought in cycles and processes of generation, degradation, and rejuvenation. It had uses for seafood (kaimoana), bathing, and healing.

Wai mātaitai – significant estuarine or brackish waters.

Waiwera – hot water used for healing purposes, bathing, recreation.

Wai whakaheke tūpāpaku – water burial sites.

Waikino – literally means bad or impure water (e.g. stagnant pools). Often associated with past events, polluted or contaminated water.

Waimate – water that has lost its mauri, or life force. Mate is associated with death, and Waimate may have been used in places of contamination and tapu, historic battles, dead, damaged or polluted water, where water has lost the power to rejuvenate itself or other living things. Waimate, like Waikino, has the potential to cause ill fortune, contamination or distress to the mauri of other living things or spiritual things including people, their kaimoana or their agriculture. The subtle difference between Waikino and Waimate seems to be based on a continued existence of mauri (albeit damaged) in the former, and its total loss in the latter. Waimate also has geographical meaning – to denote sluggish water, a backwater to a mainstream or tidal area – but in this sense the Waimate retains its mauri.

Traditionally, each body of water was considered to have its own source of life, its own mauri. If the mauri of one body of water came into contact with another, both were placed at risk and the ecosystem equilibrium was disturbed.[15] The mixing of water or the separation or division of natural systems can markedly affect and decrease the mauri in many places. Rivers or streams flowing into one another, into a lake, or into a harbour or estuary, are often assessed with different mauri. That mauri is assigned either to specific parts of a river, stream, or lake, or applied to the whole ecosystem. Māori environmental concepts therefore focus on keeping specific parts of the natural environment pure, unpolluted, and connected. These concepts recognise that mauri can be sustained and enhanced to some extent through the actions of kaitiakitanga. This holistic approach is used to identify where a problem originates and to assist Māori to determine what is or is not achievable, in practical terms to restore and improve the mauri health state.

4.5 Transitional mauri indicators

The indicators to describe the transitional shifts and changes in the mauri health state are:

- Identifying both historical and contemporary cause-effect relationships shifting and changing the mauri health state.
- The concept and attributes of mauri are determined to investigate the issues and concerns (i.e., loss of flora, fish stock numbers of tuna are critically low etc.).
- A holistic approach is taken to determine the detrimental effects on the health and well-being of people.

[15] Durie, M. (1998). *Whaiora: Māori health development* (2nd ed.). Auckland: Oxford University Press.

- The priority areas most at risk for both people and their natural world are identified to be applied to the next Mauri health state.

Pilot study on the Papanui stream for the second mauri health state

4.6 Introduction (Part B)

The second mauri health state is applied to the pilot study on the Papanui stream to discuss the importance of mana whenua articulating for themselves the concept and attributes of mauri. There were some initial assessments undertaken to articulate perceptions of environmental change affecting activities such as, access to mahinga kai for harvesting, uses with particular waters and recreational uses. Mana whenua identified their key issues, concerns and priority areas.

For the Wai māreparepa process there is an outline of whaka puaki and whaka tangi.

4.7 Concept and attributes of Mauri

There was a discussion with whanau on the concept of mauri and to start defining what the attributes of mauri might be:

> ***Mau*** *– meaning the continuing, lasting established and fixed state,* ***Ri*** *– means to screen, bond, protect and* ***u*** *– means fixed, to arrive at or to reach land….Mauri is a life force, energy which is potent, vibrant, creative…essence, that's what we need to protect. It is huge, can't always put a physical thing on it. Happenings along that stream…preserve that and the Mauri that is there, but has been tampered with… Obligation to ensure that the Mauri is upheld – lots of contributing factors. Ensure that the essence is maintained, need to put some outcome measures as to what does that look like going forward… Whanau responsibility to uphold the Mauri…For me mauri is very personal, I have a relationship with everything which is intimately tied and connected to my wellbeing so when I see our taonga polluted my wairua, wellbeing is diminished…therefore every living thing whether it be a plant, animal, fish or insect – it has an energy which must be protected….we are the kaitiaki over all these living things that have a mauri and we must protect it for our mokopuna to be able to use and enjoy.*
>
> *When the mauri was healthy there was plenty of kai in the Papanui River (it was a deep river then, not the stream it is now)…we could get an abundance of kai for tangi, hui –big drums of watercress, koura, tuna…the mauri of a stream is reflected in how much kai is abundant and plentiful…mauri connects me to that tree or fish in the water so we are all related coming from the same source…*
>
> *Kei e ora te wai, kei te ora te whenua, kei te ora te tangata – if the water is healthy, the land and people are nourished….for me water is everything, it feeds and nourishes us and we cannot survive without clean water…*

The mauri team used Table 4.1 (over-page) to illustrate what the attributes of mauri might mean for whanau and to understand how the mauri might be enhanced and restored. The Table was presented by Garth Harmsworth within his power-point presentation at a wananga held with whanau showing the attributes of mauri which he had adapted from the HBRC Tukituki Choices report (2011).

Table 4.1: Attributes of mauri

Attributes of mauri	How mauri can be enhanced/restored
- Water depth, minimum flow	- Increase minimum flow, maintain flows
- Mahinga kai quality and availability Abundance/presence/scarcity of taonga species	- Improve habitat for species such as tuna, native fish, taonga
- In-stream nutrients	- Reduce nutrient load from point source discharge and diffuse pollution sources
- Native fish species (abundance/presence/absence/scarcity)	- Ensure in-stream water quality parameters– e.g., phosphorus, toxicity, nitrates – can support and sustain native species populations and desired condition
- Natural flow and flow variability	- Ensure water takes do not significantly alter river and stream flow levels and improve flow variability by reducing the length of time flows are at or near minimum flow
- Health of Waipuna (freshwater springs) and aquifer quantity and quality	- Ensure groundwater abstraction is sustainable and mitigations are implemented to minimise nutrient leaching
- Wetland health	- Ensure water takes do not drop the water table too low as to adversely affect wetlands, retain and restore culturally significant wetlands
- Inter-connections between awa and people (marae/whānau/hapū/iwi)	- Strengthen and support connections between people and waterways through cultural activities such as: increase understanding of mātauranga cultural health monitoring, customary rights, customary activities, mahinga kai, and recreation

4.8 Shifts and changes in mauri

Wai māreparepa – whaka puaki: process recognises **why** mana whenua have reciprocal responsibilities as the kaitiaki to protect, enhance and to sustain the mauri, life force capacity of all living things, taonga. This phase requires attentive listening, sensitivity and understanding of **what** the concerns and issues are for mana whenua.

Mana whenua reflected on their role as Kaitiaki and responsibility to protect, enhance and sustain the mauri of all living things, taonga tuku iho entrusted to them to ensure their survival for future generations to access and use. Having an understanding of mauri that was defined by the marae and hapū provided the basis for whanau to consider what were their aspirations, goals, (bench mark measures) for improving the mauri of the Papanui stream:

We take our role as kaitiaki seriously and I have taught my moko how to only take enough tuna, koura from the river and pāua, mussels, pipi, karengo from the sea for a feed for your whanau…but I see people taking under sized pāua,… the cows polluting our streams, the farmers taking too much water out of the stream, their stock trampling the banks and wrecking the areas where inanga spawn… well clean up the awa, fence off the stock.

My vision is that my moko can go down to the stream and get a feed of tuna, koura and watercress…we need to clean up the awa so that the tuna and other taonga will be healthy again…we want to be able to exercise our Kaitiaki role to protect and to look after all our taonga…the council needs to be consulting with us and involving us in decision-making and to managing the Papanui stream…that we reclaim our traditions, knowledge that has been lost on the stories around the awa so we can pass that down to the next generation…we need jobs so that our kids will come back to the area because there are hardly any whanau living here now…we need resources to be able to clean up the awa and to stop the farmers from polluting our stream

With the farmers and agriculture, access to mahinga kai stopped us connecting people with the awa – being able to access places again. The Mauri has become weak and it means the wairua of people has been affected….We couldn't get into the stream, it was gungy, murky and it was supposed to be fence off…It's only been 30 years ago when those awa were ok…the change in the way that the land has been farmed…the intensive farming on the land has made such a great change in the mauri of the awa…the amount of pollution that come off the farms…there are regulations but it's not doing any good…pollution, industrial waste and the mess that comes through the dairy industry…there are no eel, tuna, up by the bridge in the stream…we have struggled for many years to keep our stream health and plentiful…cattle in the stream….the level and quality of the water is so shallow now….there is algae all over the stream…used to be able to row a waka on the Papanui stream…now the water hardly comes up to your knees…

4.9 Issues and concerns for mana whenua

Wai māreparepa – whaka tangi: giving full expression or voice to the emotional, spiritual, social, mental and physical dimensions – embodied in the four corner stone structure of a house[16] that can be weakened when one dimension shifts or changes. This phase must ensure a holistic approach to understand **how** the diminishing mauri life force is inter-twined with the health and wellbeing of people.

Whanau expressed frustration, loss and some hurt when considering how the mauri life force had changed and shifted to the extent that in some areas along the stream, the mauri was almost non-existent:

We grew up along the Papanui stream at a time when the water was higher and could get a feed of koura, tuna…now I wouldn't take my moko down there it's just too paru and smells…I wouldn't touch the watercress in the water either. I feel sad for my moko who can't swim in the stream.

The mana of our marae is affected when we can't get tuna to feed our manuhiri…for tangi or hui at the marae…

The mauri of the awa is so bad in places….how does that make me feel especially when we could still get some koura like my dad and koro...now my boys don't know what it is to get koura because there is none around where we live anymore…they just see a polluted stream and don't understand the hurt I feel for them….they miss out on learning how to gather kai from their koro and don't learn how to care for the awa…they miss out on hearing the stories I grew up with…they won't have a memory of the awa when it was healthy…

[16] Reflecting the four dimensions of Te Whare Tapa Whā health model developed in the 1980s.
Durie, M. (1998). *Whaiora: Māori health development* (2nd ed.). Auckland: Oxford University Press.

4.10 Cultural assessment on the mauri health state

The whanau worked with the Mauri team to identify numerous sites along the Papanui stream which could be accessed to undertake a cultural assessment of the mauri health state for each site. The mauri team used the narrative bands in Table 4.2 (below) to assist the whanau to describe the health state mauri of the stream and surrounding habitats, vegetation giving a voice, narrative to how mana whenua were using their senses to feel, see, hear, taste, smell etc.[17]

Table 4.2: Narrative bands to describe the mauri

Pai rawa atu, ka rawe (excellent): mahinga kai enhanced or restored, and a full range of cultural values and practices exhibited and maintained
Ka pai (good): mahinga kai maintained (ecosystem functioning well), and a wide range of cultural values and practices are expressed, supported, and maintained
Āhua (fair): mahinga kai below acceptable iwi/hapū standards and a paucity of cultural values and practices are expressed and maintained
Kino, pārū, pōhara, (Poor): mahinga kai diminished/degraded and cultural values and practices not being sustained

Most of the sites assessed were considered to be in very poor health and received the lowest ranking of kino, paru, pōhara. There were a couple of sites considered to be slightly in better condition or Āhua – fair where whanau were still able to access tuna and watercress from the site.

The mauri team attempted to identify a site which might be considered 'Pai Rawa" as a bench mark of where the mauri was healthy and mahinga kai was enhanced. But, unfortunately, it was difficult to locate a healthy site.

Another assessment tool used to assist the whanau to determine the mauri of the stream was the SHMAK kit which provided a very practical set of tools to measure ph. level, water velocity, number of vertebrates, evidence of vegetation, water flows and other factors to enable the whanau to assess the mauri of the site. Through the band narratives and oral interviews gathered from whanau the key issues and concerns were:

- loss of vegetation along the embankments of the stream;
- flows were well below what is sustainable for tuna and other taonga to survive and thrive;
- a decline in mahinga kai quality, size, diversity and numbers of taonga species;
- tuna habitat was significantly degraded;
- river banks and margins had been degraded through stock trampling and further eroding the soil;
- The mauri of the stream had been severely impacted by agricultural run-off, sewage and sludge from the oxidation pond and landfill;

[17] The 4 main bands are consistent with the National Objectives Framework for freshwater management.

- The stream was degraded by the introduced species such as the willows and low water levels as a result of water abstraction.

4.11 Identifying Priority areas most at risk

Many of the whanau expressed a loss and anger at the mauri of the Papanui stream which had deteriorated to the point of being almost diminished in places. Particular priority was given to restoring the tuna, kōura, watercress and to improving water quality (flushing) and to increasing the water levels of the stream. There needed to be vegetation replanted along the streams to provide habitats for the tuna. The stream needed to be fenced off to stop stock in the water and the minimum standards of water take for irrigation needed to be higher to enable the fish life, fauna and flora to thrive again.

4.12 Feedback on the second mauri health state

- The whanau appreciated the questions around what the concept of mauri meant to them? Their responses were very personal and heart felt.
- The attributes of mauri outlined in the table developed by Garth helped the whanau to think about their aspirations, vision and goals for the Papanui stream.
- Whanau wanted a simple process for cultural monitoring and assessment and appreciated the bands narrative as a reference point to articulate for themselves how they felt about the mauri of the stream.
- The whanau enjoyed the SHMAK kit where the various tools were easy and fun to use. It also gave them a better understanding of what to observe in terms of changes to the mauri of the stream taking into account the water quality and other factors.
- Having Māori cultural values at the centre of any assessment was considered an important reference point which firmly empowered whanau to express their perceptions - Māori ways of knowing, observing and preferences.
- The whanau found this mauri health state useful in terms of gaining clarity on their key issues, concerns and priority areas most at risk.

Figure 4.1 Images of the diminishing mauri health state of the Papanui stream

Next is the section outlining the third mauri health state.

5. Te Mahi o Haurongo: Third Mauri Health State

5.1 Introduction (Part A)

Te mahi o haurongo refers to the action of doing the restorative work. The third mauri health state identifies culturally appropriate measures, bench marks or indicators for achieving the desired outcomes. The main issues, concerns and priority areas identified in the previous mauri health state could be applied to develop strategic management plans, remedial actions, control measures and standards for improving the mauri health state.

Various mātauranga – tikanga based assessment tools are explored to determine their usefulness. There is also a discussion integrating mātauranga and western science knowledge into environmental management plans and an outline of a co-planning framework. Finally, the restorative action indicators for this mauri health state are outlined.

5.2 Overview of mātauranga - tikanga based assessment tools

There are various mātauranga - tikanga based assessment tools that have evolved over the last twenty years or so. A number of marae/ hapū/ iwi are trialling, testing and refining cultural monitoring approaches and tools for their own use. Any cultural monitoring programme utilised must provide a balance taking into account mātauranga, cultural values alongside science knowledge for different parts of the ecosystem or environment. Cultural monitoring is based on recording and collating appropriate mātauranga Māori based and science knowledge – to organise, collect, analyse, interpret, and report indicators within appropriate tikanga-based monitoring frameworks. Once established, mātauranga - tikanga based monitoring is used to express Māori values, monitor change (spatially and temporally), respond to issues, inform planning and policy, plan actions, and underpin the long-term management of freshwater. Further, there is a discussion on integrating mātauranga with western monitoring approaches.

The expanded knowledge base which uses mātauranga and tikanga values alongside scientific knowledge, can be complementary and 'requires a high level of discourse.'[18]

Discussion and review of cultural monitoring frameworks and methods need to consider the following questions:

- How do Māori see their environment changing in time? What are Māori values? What are the attributes of mauri?
- How do Māori assess the state of health of the environment?
- What indicators do they use?
- How can the strong link between environmental change and Māori well-being be taken into account in environmental monitoring?
- How can Māori knowledge be used to underpin environmental monitoring?
- How can monitoring by Māori complement other approaches?

[18] Awatere, S. & Harmsworth, G. (2014). *Ngā Aroturukitanga tika mō ngā Kaitiaki: Summary review of mātauranga Māori frameworks, approaches, and culturally appropriate monitoring tools for management of mahinga kai*.

- How do Māori develop and set limits or baselines to protect, sustain, and enhance Māori values?

A range of mātauranga Māori and western science-based approaches for monitoring and reporting have been developed in New Zealand, many of which are complementary to science monitoring. The effectiveness of a cultural monitoring framework depends on whether it has been shaped by hapū and marae drawing on Māori ethics and principles.

5.2.1 Benefits

A significant benefit of mātauranga –tikanga based planning frameworks is the ease with which kaitiaki can connect with and makes sense to them. Kaitiaki can relate to an ideology grounded in mātauranga. Specifically, the potential benefits are outlined below:

- Provides a Māori perspective on how the environment is changing – based on Māori values;
- Identifies issues from Māori perspective;
- Measure progress towards Māori goals and aspirations;
- Uses mātauranga Māori and Māori values (relationship or connection to place)
- Uses indicators and assessment;
- Links environmental health to Māori wellbeing;
- Provides a basis for planning, policy and reporting;
- Necessary to plan, implement and monitor actions and activities and show progress to goals (ie, restoration projects, mahinga kai, capacity building).

The mauri team examined and utilised various monitoring tools for this third phase and provide a general description of the three key inter-relating mātauranga and tikanga based tools and models for cultural monitoring placing particular emphasis on Ngā Atua.

5.2.2 The cultural health index (CHI)

The CHI monitoring tool evolved from a study in the 1990s by Gail Tipa and Laurel Teirney on the Taieri River which led to the development of environmental performance indicators from a hapū/ iwi perspective.[19] The CHI tool creates an index of cultural values important to Māori to monitor changes in the mauri. It is made up of three interlinking components: status of the site, mahinga kai values, and stream health when combined, give a comprehensive assessment of the cultural health of the river/ mauri of taonga. A score measure for each component is applied to a specific site to give an overall assessment of the health/ mauri and to collect data for analysis to form the basis for action planning and restoration of mauri.

The CHI model has been adapted by marae and hapū to identify their cultural values of importance. The score system has been particularly useful in providing a quantitative systematic approach alongside an inventory of taonga species (i.e., mahinga kai) to assist marae/ hapū to diagnose issues, decide on priorities and devise remedial actions necessary for the enhancement, restoration and improvement in the mauri of taonga.

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[19] Tipa, G. (1999). *Taieri River Case Study.* Ministry for the Environment Technical Paper No 58, Environmental performance Indicators: Māori Indicators Case Study.
Tipa, G & Teirney, L. (2003). *A Cultural Health Index for Streams and Waterways; indicators for negotiating and expressing Māori values.* Technical Paper 75. Ministry for the Environment, Wellington.

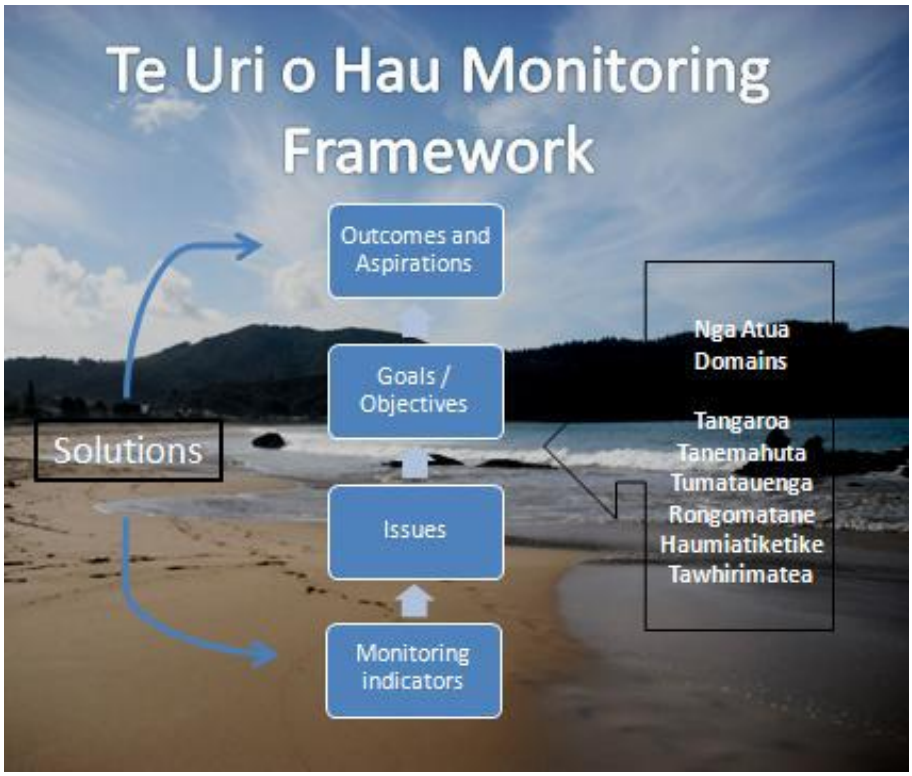
Applying the CHI follows a systematic approach:

- Mana whenua choose a stream and define the purpose and focus;
- Interviews with whanau using qualitative methods to collect data for analysis and a literature review might also be compiled from Māori manuscripts on the history etc..;
- Sites to be assessed are selected and confirmed by mana whenua;
- Field assessments are undertaken by team members to complete the score sheet;
- Other tools such as, the Electric fishing and /or netting might be used to identify fish species in the waterway;
- Data is collated and entered (i.e., examples might include GIS, State of the Takiwa data system);[20]
- CHI scores are calculated to inform mana whenua and assist in identifying priorities for remedial action.

5.2.3 The Te Uri O Hau framework

The framework developed for the Kaipara Harbour sought to link indicators to outcomes and aspiration[21] (see Figure 5.1 below):

Figure 5.1 Te Uri O Hau (Kaipara



[20] Pauling, C. (2007). *State of the Takiwa.* Te Runanga o Ngai Tahu, Christchurch.

[21] Te Uri o Hau Environs Holdings Trust 2012. *Assessing the mauri of the Kaipara: Phase 2 – developing a monitoring framework for Te Uri o Hau*. Whangārei, Environs Holdings Ltd.

5.2.4 The Ngā Atua domains framework

The framework was developed from Tiakiana Te Taiao from the Nelson-Motueka region[22] which had been adapted from The Te Eri O Hau model to provide a description of mauri indicators and descriptors. Within the Ngā Atua domains framework, each Atua domain represents an ecosystem from Tangaroa (estuarine and river ecosystems) to Tane Mahuta (terrestrial ecosystems).[23] The Ngā Atua domain indicators were adapted from the CHI model and examples of atua indicators are described in Figure 5.2 and Table 5.1).

Figure 5.2 Ngā Atua Kaitiaki domain framework

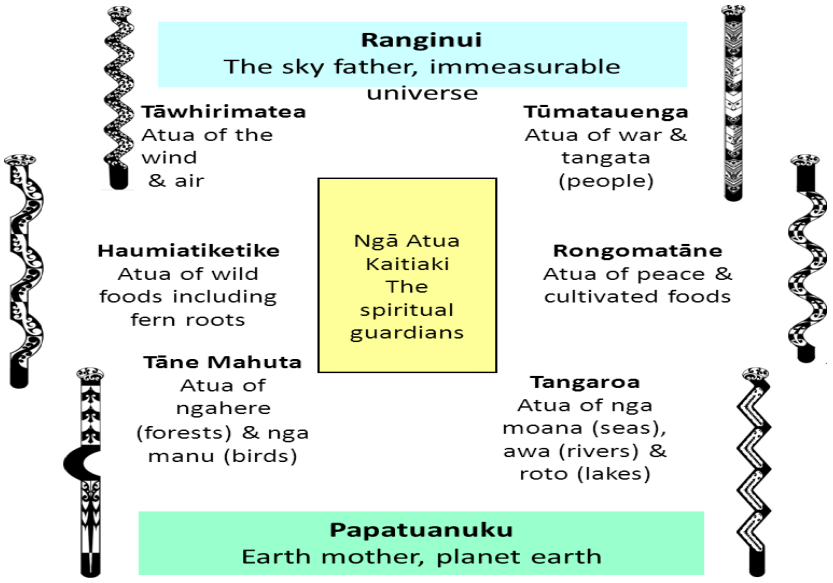


Table 5.1: A list of indicators to complement the Ngā Atua domains framework.

Tangaroa

- Water Clarity
- Water Flow
- Water Quality
- Shape and form of river, riverbank condition, sediment
- Insects
- Fish

Tāne Mahuta

- Riparian vegetation
- Catchment vegetation
- Bird life (species)
- Ngahere/Taonga
- Pests

Haumia tiketike

- Mahinga kai
- Rongoa

Tūmatauenga

- Human activity, Use of river
- Access
- Cultural sites

Tāwhirimātea

- Smell
- Mauri / Wairua
- Feeling, taste, wellbeing

[22] Walker, D. (2009). *Tiakina te Taiao: Iwi Estuarine Indicators for Nelson.* Nelson City Council.

[23] Harmsworth, G., Dixon, L. & Awatere, S. (2011). Review paper*: Improved reporting tools – Māori cultural monitoring approaches throughout Aotearoa*. Lincoln, Landcare Research.

The CHI model and the Ngā Atua domains framework, have the potential to be used particularly when evaluating whether a change in management processes (e.g. water extraction or the improvement or decline in water quality) or infrastructure investment has on the health state of mauri.

The mauri team acknowledge there are more models that have been developed since 1990. We encourage mana whenua marae, hapū to explore these other models further to make informed decisions in the development of appropriate cultural monitoring tools that will assist in developing environmental management plans informed by mātauranga for achieving the desired outcomes to improve, restore and enhance mauri.

Next we discuss the potential benefits of integrating mātauranga and tikanga Māori monitoring framework and approaches with Western knowledge and approaches within a management plan.

5.3 Integrating mātauranga with Western monitoring approaches

Monitoring is only part of the planning process between values identification and progress towards outcomes. However, monitoring methods can be used to identify key attributes, indicators or management variables which might involve both mātauranga Māori and community – scientific based approaches which are complementary.

The CHI and the Ngā Atua domain assessment tools combine a blend of mātauranga Māori, traditional concepts, and western science to provide Māori with ways to assess and articulate cultural values and perspectives and to help assess mauri health state. Importantly, there needs to be both qualitative narratives and quantitative scoring system approaches used. Together there is greater potential to provide a more comprehensive and fuller understanding of the connections and deep emotions Māori have for their taonga especially when changes in the mauri health state of taonga is interwoven with the health and well-being of people. Table 5.2 (below) outlines an understanding of mātauranga and western knowledge.

Table 5.2: Te Ao Māori and Te Ao Pākehā

Te Ao Māori	**Te Ao Pākehā**
Iwi/hapū based	Individual, group based, industry
Perspectives – world view (cultural lens)	Perspectives – world view
Issues	Issues
Aspirations	Aspirations
Values, concepts, practices (e.g., Kaitiakitanga, manaakitanga, whanaungatanga)	Values: human, economic, social, ecological, intrinsic, recreation
Policy, goals, objectives	Policy, goals, objectives
Iwi/hapū management plans	Regional plans, Unitary plans
Kaitiaki plans	District plans
Research methods: e.g., Kaupapa Māori research, science	LTCP
Monitoring, evaluation: Tohu – Cultural indicators	Research methods, western science methods, specialist methods
	Monitoring, evaluation: environmental performance indicators

Garth Harmsworth[24] has identified three environmental monitoring approaches that have the potential to be complementary and are outlined in Table 5.3 (below):

Table 5.3: Three environmental monitoring approaches that are complementary

Mātauranga Based	**Community – Scientific Based**	**Scientific Based**
Māori indicators giving full Expression to Māori values, Connections and relationships Examples:	Community based indicators - low level of technical input, skill but scientifically robust, and part-value based, cost effective, relatively simple and short duration Examples:	requiring higher levels of technical input and skills robust sampling strategies analysis and interpretation may be time consuming. Examples:
Taonga Lists	Hydrology	Chemistry, water quality
Key sensitive taonga indicators	Soils/ nutrients	nutrients, hydrology
Te Mauri	intactness of wetland	water table modelling
Knowledge on users and preparation	connectivity/ buffering or	botanical mapping
Of taonga	fragmentation	classification of plants
Land uses, point	introduced plants	ph
Discharges, modifying and impacting	animal damage	bacterial counts
On cultural values and uses	modification to catchment	giardia
	Hydrology	cryptosporidum
	Water quality within catchment	GIS applications
	Other land use threats	satellite imagery
	Key undesirable species	studies of fish, macro-
	% catchment in introduced vegetation	invertebrates,
	Animal access	macrophytes

5.4 Co-planning framework

There is an opportunity to explore the potential for co-planning framework which affirm and assert mana whenua rights for Rangatiratanga in the exercise of their Kaitiakitanga responsibilities.

The mātauranga and Māori tikanga based frameworks described in this section require the recognition by policy analysts and planners of a dual planning framework and that Māori planning can co-exist with western planning frameworks. Failure to do so will most likely lead us down a path of co-option where Māori values, concepts and ideas are co-opted into the dominant framework and given new meanings.

[24] Harmsworth, G. (2005). *Integrated Catchment Management: the value of building partnerships with indigenous groups.* ICM-AGM, Nelson.

As marae and hapū within Hawkes Bay negotiate their Treaty of Waitangi claim and settlement agreements, they will be seeking a Treaty – based relationship with the HBRC whom have already made some progress towards achieving this outcome. The mauri team have included a template for collaboration co-management which might assist the HBRC as they chart a course moving forward. The co-planning Treaty-based framework has been operating in Waikato effectively for several years (see Appendix One).

5.5 Restorative action indicators

The indicators to describe the restorative actions for this mauri health state are:

- Integrative approaches taken will ensure mātauranga Māori is given equal weighting alongside western-science knowledge and practices.
- Strategic plans that are developed will consider a diverse range of factors (i.e., resources, technology, time, specialist knowledge, skilled workforce, availability of new knowledge, issues associated with global warming – droughts etc.)
- The management plans developed must uphold the mana and well-being of Māori, to strengthen their kaitiaki role, empower and mobilise whanau to take action for change.

Pilot study on the Papanui stream for the third mauri health state

5.6 Introduction (Part B)

The third mauri health state involves the development of strategic remedial and restorative actions that seek to achieve the desired outcomes. The time constraints on the pilot study could not realistically achieve all the restorative action indicators for this mauri health state.

There is a discussion on the cultural monitoring tools that were used by the whanau to assist them to clarify and account for the mauri health state at this time. Information was provided and explored on alternative approaches for the whanau to consider in developing their strategic management plan grounded in mātauranga, cultural values.

Wai māreparepa - whaka hohourongo phase is discussed.

5.7 Cultural monitoring tools

In the second mauri health state whanau were introduced to the band narratives and SHMAK kit to help clarify their key issues, concerns and priority areas most at risk. In this mauri health state the mauri team introduced a range of cultural monitoring tools all embedded in mātauranga – tikanga and offering a mix of qualitative methods (using the senses to observe changes in the mauri health state) and quantitative methods (score sheets ranking the current mauri). This included:

- Ngā Atua domains Framework
- CHI model
- The Te Uri o Hau framework

  (All three tools are described in Part A)

- The Mauri Compass* [25]
- Mauri of Waterways kete*[26]
- Te Mauri Model* [27]
- The mana whenua framework Te Koharo O te Ngira* [28]
- Cultural Flows*[29]

(* see Appendix Two for a more comprehensive description of these frameworks)

5.8 Field trip – cultural monitoring assessment forms

There were several field trips to the sites selected for this pilot study. Of the cultural monitoring tools presented, there was particular emphasis on the CHI model and the Ngā Atua Domain framework and their assessment forms outlined below:

5.8.1 State of the Takiwa assessment form

The first form was designed by Craig Pauling as part of the State of the Takiwa programme developed by Te Runanga O Ngai Tahu. The site assessment form had combined the CHI score sheet and the SHMAK kit score sheet into one form. The score ranking was 1 – being immense pressure through to 5 – indicating minimal pressure. Information was recorded on:

1) Entry details including: the site location, date of visit, person recording the data;
2) Questions on: the pressure of the site; degree of change; suitability for harvesting mahinga kai; significance to wahi tapu values; actions needed to improve the health of the site; overall health of the site.
3) An assessment of abundance requiring whanau to tick a box indicating few, some or lots alongside their notes and observations on the species identified for each site including: native plants; native birds; native fish species; other natural resources introduced plants and animals.

(see Appendix Three for a copy of the State of the Takiwa assessment form)

Whanau responded well to the questions asked and were able to give an individual score which was collated together to give an average low ranking of 2 indicating the whanau considered the site to be under immense pressure and that the over-all health state mauri of the site was very poor. Through observations made whanau wrote down the types of taonga species, native plants, bird life, flora, invertebrates, and other features (ie, water quality, water levels, evidence of stock in the water, overgrowth of vegetation, types of exotic plants etc.). The taonga lists developed and produced for previous environmental cultural assessment reports (i.e., work commissioned by the HBRC for the proposed Ruataniwha

[25] Ruru, I. (2014). Concept Paper on: *The Mauri Compass.* Te Runanga O Turanganui a Kiwa.

[26] Jefferies, R & Kennedy, N. (2009). *Māori outcome evaluation: a Kaupapa Māori outcomes and indicators framework and methodology.* Hamilton. The International Global Change Institute (IGCI). The University of Waikato.

[27] Morgan TKKB 2007. *Waiora and cultural identity: water quality assessment using the mauri mode*l. AlterNative 3(1): 44–69.

[28] Tāmaki Regional Mana Whenua Forum. (2007). *Te Kōhao o te Ngira: mana whenua response to the draft long-term sustainability framework for the Auckland region.* Auckland Regional Council.

[29] Tipa, G & Nelson, K. (2012). Identifying cultural flow preferences: Kakaunui River Case Study. *In Journal of Water Resources Planning and Management* 138(6): 660-670.

Water Storage Scheme and the cultural values report produced for Plan 6) were used as a reference point for whanau to update and amend the list.

Some whanau had not visited particular locations along the Papanui stream since they were younger and were shocked at the shifts and changes in the mauri. For example, what was no longer there like vegetation cleared, no evidence of tuna and koura in the stream and other flora.

5.8.2 Ngā Atua domain assessment form

The second form introduced was on the Ngā Atua domain score sheet developed by the Kaitiaki working party group involved in the Te Tiakina Te Taiao Iwi estuarine indicators for the Nelson project. The form includes details on the

1) General details of the Estuary name, catchment, site number, site status, site type, return status, name of iwi monitor.

2) Each Ngā Atua domain had a series of question to be answered and a score ranking:

- Tangaroa domain: included: the estuary edge, the channel condition, water clarity, seawater/ freshwater interface, estuarine habitats, shellfish, fish species.
- Tane Mahuta domain included: estuarine vegetation, edge vegetation, estuarine habitats, bird and reptile life, pest plan/ animals, taonga.
- Tumatauenga domain included: use of estuary and margins (wet and dry).
- Tawhirimatea domain included: smell of estuary, sound of estuary.
- Haumia/ Rongo domains included: rongoa species, mahinga kai species, mahinga kai today, mahinga kai traditional.
- Wairua/ mauri section on the over-all health which included: feeling in puku, CHI score, action points.

(see Appendix Four for a copy of the Ngā Atua domain assessment form)

The mauri team would have preferred the whanau to develop their own descriptions for the Ngā Atua domains and their indicators. For example, there are mātauranga localised to Te Whatuiāpiti marae and hapū, and provided in the first mauri health state. There is the Atua kaitiaki Hine wai - the guardian of fresh water and the Atua kaitiaki Parawhenuamea - the guardian for all nutrients (sourced from the vegetation on the mountains) that goes into the rivers to feed the fishery, invertebrates etc. The mātauranga for Te Whatuiāpiti marae/ hapū could be adapted to the Ngā Atua domain framework and used to assess the mauri health state which would be more meaningful and relevant for the whanau.

Unfortunately, the time constraints of the pilot study made it unrealistic to develop their own Ngā Atua indicators. The mauri team decided to use the form developed by the Kaitiaki working party group involved in the Te Tiakina Te Taiao project. It did give whanau an opportunity to review the form and to evaluate the merits of the Ngā Atua tool.

The whanau found the Ngā Atua indicators developed to assess the mauri health state easy to relate to and could be aligned with their Māori world view and perceptions of the spiritual realm.

5.9 Integrating mātauranga with western knowledge

The mauri team provided information developed by Garth Harmsworth on how mātauranga cultural values might work alongside western knowledge. There was some agreement amongst the whanau that there was a need for HBRC in particular, to recognise and give equal weighting to Māori concepts and perceptions, cultural values – Ta Ao Māori, Kaitiakitanga, wahi tapu, mauri, and other important mātauranga and tikanga.

Whanau were critical of the narrow focus of data collected on the Papanui stream which gave more priority to science and western values such as, levels of nutrients in the water, fauna and flora, water quality, minimum flows and other quantitative information gathered. The narrow focus on bio – environmental indicators did not take into account Māori world views and concepts of mauri considered the energy life force that was connected to the health and wellbeing, mauri-ora/ wairua of people. There needed to be qualitative methods used to express stories and narratives on Atua spiritual realm in particular, traditions and history, the deeper meanings, emotions – spiritual, social, mental and physical elements – to provide a more holistic approach in developing strategic management plans for the Papanui stream.

Te Whatuiāpiti marae were aware of the steering group formed to include the Te Taiwhenua O Tamatea representatives, farmers and HBRC working collaboratively together to improve the health mauri of the Papanui stream. The marae were seeking to exercise their kaitiakitanga responsibilities and expressed a strong desire to be part of the steering group. One of the mauri team members Brain Gregory was also a Te Taiwhenua O Tamatea representative on the steering group and had agreed to raise the matter with HBRC staff who were very supportive and acknowledged that other landowners had also expressed an interest in joining the steering group.

5.10 Feedback from whanau on the third mauri health state

- The whanau enjoyed the field trips and the insights they gained from observations using their senses to get ‘a feeling in the puku.’
- Whanau found both forms easy and simple to complete and would have liked to develop their own Ngā Atua indicators which expressed their connection and relationship to the stream.
- The combination of monitoring tools used (i.e., band narratives, SHMAK kit, Atua domain framework and the State of the Takiwa assessment form) gave weighting to Māori ways of knowing and affirmed their intimate knowledge of the natural world.
- The use of qualitative methods (ie, band narratives, oral histories collected and observations recorded on the two assessment forms used) and quantitative methods (ie, SHMAK kit, score sheets to give an overall health ranking) had the potential to provide a holistic and more comprehensive understanding of the mauri health state.
- The whanau were very responsive to the emphasis on mātauranga and tikanga based cultural monitoring assessment tools used.
- In joining the steering group Te Whatuiāpiti marae and hapū could recognise the opportunity to influence the development of an integrative strategic management plan that gave equal weighting to western approaches with mātauranga and tikanga.

Figure 5.3 Images of Whanau out on the Papanui stream






Next is the section outlining the fourth mauri health state.

6. Te Aroturuki Kaupapa: Fourth Mauri Health State

6.1 Introduction (Part A)

Te Aroturuki Kaupapa refers to monitoring for the direction of the programme. The fourth mauri health state is continually reviewing progress to restore mauri and the health and well-being of people. There is a discussion on the monitoring progress towards improvement and to identifying the monitoring indicators for this mauri health state.

6.2 Monitoring progress towards improvement

This fourth mauri health state represents a time of reviewing and accepting progress towards (or away from) the desired outcomes sought. Progress on the changes are monitored and assessed to measure improvements in the mauri health state within the bio-environment and the health and well-being of people.

Monitoring is essential to any sustainable management regime, and the mana whenua are in an excellent position to monitor the changing health state of mauri within ecosystems and the environment, both because of their proximity and because they are directly involved and dependent on its resources.[30] Restoring the health state of mauri within the environment and people requires an enormous commitment of time, energy, human capacity and skills, resources and the right circumstances adaptable to change (such as technology, weather conditions).

The monitoring measures need to be manageable and reflexive to enable adjustment and changes in timeframes and other conditions. Restoring the health state mauri of the bio-physical environment is difficult to measure and needs to be viewed in a continuum that is dynamic and reliant on a number of conditions and circumstances. A number of taonga might need to be monitored and reviewed over time to determine whether changes in new technology, new knowledge or other conditions will increase the capacity of the resource to survive and thrive or be restored to its former optimum health state (such as watercress and mahinga kai).

6.3 Monitoring indicators

The monitoring indicators include:

- Continually monitoring, reviewing and assessing progress through various integrative approaches which are working towards common goals and realistic outcomes that can be achieved at this time taking into account various influences and factors.
- Monitoring and following up on health risks and any other issues arising.
- Maintain accurate records on data collection using various methods (i.e., GIS, cultural mapping. State of the Takiwa data system).
- Monitoring indicators that ensure a holistic perspective.

[30] Wakefield B.W & Kahu. M (2008). *Haumanu Taiao Ihumanea: Collaboration study with Te Tai O Marokura.* PhD. Lincoln University.

Pilot study on the Papanui Stream for the Fourth Mauri Health State

6.4 Introduction (Part B)

The time constraints on the pilot study meant that the previous restorative action indicators were not completed and that monitoring the progress of improvements to the mauri health state could not start until there is a strategic management plan produced and restorative actions are taken to improve the mauri. The mauri team were able to outline the fourth mauri health state and asked whanau to share their comments and feedback.

Wai māreparepa - whaka oho phase is discussed.

6.5 Feedback from whanau for the fourth mauri health state

Wai māreparepa - whaka oho: phase will monitor progress, recognising and accepting the current situation and making adjustments or identifying new goals to start the process again.

There was a general agreement that a reality check on marae and hapū aspirations, visions was needed. This mauri health state involves monitoring progress toward desired outcomes which could be influenced by a range of factors that needed to be taken into account such as, the timing, availability of technology, resources available and other factors that could potentially assist or hinder the desired outcomes being sought. It was also acknowledged that some taonga are forever lost or may never be fully recovered because of the changes in land use or though other influences like global warming, droughts etc.

The marae were firm about their kaitiaki responsibilities which was to protect, improve, enhance and to sustain the mauri of their taonga. There was a commitment to uphold the integrity of their role as kaitiaki so that future generations would have access to the taonga gifted from our tipuna, Ngā Atua and to enjoy the taonga passed down.

Figure 6.1 Image of Te Whatuiāpiti marae and whanau

7. Application of the Pilot Study to Te Rongo-a-Tahu marae and hapū

7.1 Introduction

The final wananga at Rakautatahi marae was held to assist the HBRC in linking the Papanui stream project with the Porangahau stream project which is currently being developed. The mauri team were keen to share the progress made on the mauri monitoring framework and to seek feedback comments and opportunities to discuss the pilot with mana whenua from both Takapau marae and hapū: Rakautatahi and Te Rongo-a-Tahu attending the wananga.

All seven steps of the Wai māreparepa process is outlined

7.2 Te Rongo-a-Tahu marae and hapū

(Wai māreparepa – whaka mihi process)

The mauri team met with Te Rongo-a-Tahu marae and hapū early on in 2014 to gain their consent for the wananga to be held at Rakautatahi marae and to allow the mauri team to present the mauri monitoring framework and the wai māreparepa seven step processes that had been developed.

Two members of the mauri team were involved in another project through the Ngā Whenua Rahui fund (Jojo Heperi and Marge Hape) to improve the mauri of the Porangahau stream. The two Coordinators had started the process of engagement with Te Rongo-a-Tahu and had been sharing the four mauri health states of the mauri monitoring framework as they were evolving and taking shape and form.

7.3 The first Mauri health state: Te Ao Māori, mātauranga

(Wai māreparepa - whaka karakia process)

Te Rongo-a-Tahu affirms their whakapapa connections to the whenua expressed through the following pepeha:

Pepeha

Ko Rangi – Ko Papa

Ka puta ko Rongo, ko Tane Mahuta, ko Tangaroa, ko Tumatauenga,

ko Haumietiketike, ko Tawhirimatea.

Tokona te Rangi ki runga, ko Papa ki raro.

Ka puta mai te ira tangata

ki te wheiao, ki te Ao Marama.

From Rangi – Papa came Rongo, Tane Mahuta, Tangaroa, Tumatauenga, Haumietiketike, Tawhirimatea.
Then Rangi was thrust above and thus created the heavens and, Papa below becoming the earth mother
Then came forth human kind to the world of light.

The whanau expressed their connections to the spiritual realm of Ngā Atua and other cultural values:

> *The knowledge of our tipuna is a gift from IO. Our Tipuna kept sacred the knowledge of the three baskets of knowledge, Te Kete Aronui, Te Kete Tuatea, Te Kete Tuauri. And then gave the knowledge to those who would hold sacred the knowledge and use it for the wellbeing of the people. Only through maintaining our tīkanga and instilling Te Taha Wairua can we ensure that our teachings are tika and pono.*
>
> *Our tipuna were connected with nature and the ngahere. This is evident by the names that they left. "Tawari" – an old papakainga and marae – "Pokaka" – a hill on the limestone ridge known as "Te Kai Hinaki a Whata", and "Puketotara" another of the hills on this ridge, all these names coming from trees. So the connection between our people and our environment is illustrated in our history which has been handed down to us. We now are inspired to make this knowledge not only something from our past but also of our future. We will make available to our children the forests that gave our tipuna shelter, food, rongoa and life as a lasting legacy to be sustained and maintained for all time.*

7.4 The second mauri health state: shifts and changes in mauri

(Wai māreparepa - whaka puaki process)

Through the Ngā Whenua Rahui project, the Co-ordinators asked the whanau to define for themselves the meaning of mauri and shared the table developed by Garth Harmsworth on the attributes for mauri. The outcome of this exercise led to a discussion on a tributary running off the Porangahau stream located behind Okahukura Urupa:

> *The stream is located at the back of Okahukura urupa, Takapau, where the ancient burial site is, continuing upriver where ancient healing springs once were, and from there to carry on upstream through the Takapau transfer dump, on into where it meets the Porangahau River. The stream has special significance for Te Rongo-a-Tahu because the many springs along the stream were used by our hapū for special rituals and other activities.*

(Wai māreparepa : whaka tangi process)

In more contemporary times the mauri of the stream had diminished and was polluted through stock in the water, overgrowth of vegetation and leachate from the old landfill further down from the Porangahau stream. The whanau expressed some sorrow at the current mauri health state of the stream and believed their mana, wellbeing and spiritual health was also affected.

(Wai māreparepa: whaka rata)

The Coordinators worked with Te Rongo-a-Tahu whanau to identify sites along the stream to undertake a preliminary cultural assessment using the SHMAK kit and the band narratives. There was information provided on a range of mātauranga - tikanga based assessment frameworks and cultural monitoring tools. The whanau were introduced to the Ngā Atua domain assessment form and the State of the Takiwa assessment form with the scores revealing the stream was indeed in a poor state of health.

7.5 The third mauri health state: restorative actions

From the initial assessment and monitoring of the stream located behind Okahukura urupa, the whanau had set a goal to improve the mauri of this particular stream and started to develop a restoration plan.

The restoration plan is described below:[31]

> *The long term goal is to continue riparian planting along the Porangahau River, creating a green corridor along the length of both waterways to provide habitat for native flora and fauna and regeneration of what was once the beginning of the 70 mile bush. The cultural revitalisation includes: tree planting, stream conservation and restoration, re-establishing indigenous trees and plants endemic to the Takapau area; protecting and restoring Māori features of the waterway, ancient burial sites, and ancient healing springs that lie along this waterway. We will be conducting research into these wahi tapu sites and the historical and cultural significance of other sites in this area, as well as researching and teaching cultural practices surrounding traditional Māori use of the waterways and environment. All information gathered will be collated, authenticated and fully archived safely and securely with back up storage. We have an obligation to our Mokopuna, the Whenua, the Wai, all aspects to work towards regenerating the native flora and fauna along the stream and river margins, and to advocate to adjoining landowners the significance and importance of conservation management in our environment. Southern Star Abbey are the landowners at the urupa and have given us their full support with this project. Brother John who has been propagating and planting out native seedlings along the Manawatu at the monastery is very keen to assist and be part of this Kaitiaki group. We will also utilise modern technology, science, research and practices to ensure that we are doing the best that we can possibly do. This project is connected to the re-building of a Marae in the Takapau Township and it is being led by "Te Rongo a Tahu Marae" committee. Takapau was the gateway into the bush known as "Te Tapere nui a Whatonga" which continued through to Pahiatua. It was known as "the seventy mile bush". This was felled by Scandinavian immigrants who came to New Zealand under the assisted migration policies of the 1870's. We hope to use our knowledge of this ngahere and new findings from research gained, as a template to re-establish new forests in the Takapau area, riparian planting around our water ways, eventually extending to the marae whenua and surrounding areas in and around Takapau.*
>
> *We are very supportive of the mauri monitoring framework which gives priority to mātauranga-tikanga based assessment processes. We hope the mauri team will consider our stream as an opportunity to implement the mauri monitoring framework and to assist our marae to achieve their vision to bring back, enhance and protect the mauri of the stream.*

In terms of implementing the restoration plan, Te Rongo-a-Tahu marae and hapū have applied to the Ngā Whenua Rahui Komiti from the Ministry of Conservation to secure funds to undertake a more comprehensive research study on the stream and other activities.

(Wai māreparepa - whaka hohourongo process)

But regardless, the whanau will continue to establish their nursery and to develop a co-management process with the Landowner, Leaseholder and other interest groups (i.e., Silver Fern, HBRC) with the goal to start clearing the vegetation and other activities before the end of the year.

The whanau discussed the importance of their rights as kaitiaki to protect, enhance and to sustain all the waterways within their rohe. Te Rongo-a-Tahu welcome the opportunity to participate in restoring the mauri of the Porangahau stream and to participate in the steering group or similar management structure that is likely to be established sometime in the future by the HBRC.

7.6 The fourth mauri health state: monitoring progress

Although the Wai māreparepa: whaka oho process was not able to be enacted at this time, the mauri team described the key elements of this fourth mauri health state to monitor progress, recognising and accepting the current situation and making adjustments or identifying new

[31] This was extracted from the application prepared for Ngā Whenua Rahui Komiti, Ministry of Conservation.

goals and to start the progress again. Te Rongo-a-Tahu marae and hapū are looking forward to completing this process when their restoration plan is implemented and when the HBRC start work on the Porangahau stream.

7.7 Feedback on the mauri monitoring framework

- The whanau participants attending the wananga held at Rakautatahi marae and who also, had supported the Ngā whenua Rahui project, were very keen for the work to continue and recognised the importance of cultural monitoring.
- The whanau acknowledged the importance of mātauranga – tikanga based cultural monitoring framework that was localised to marae and hapū relationship and connection to their awa.
- Whanau expressed a strong request for the environmental monitoring framework to be taught to tamariki attending the local schools in the area (ie,, Takapau and Norsewood) and to encourage and strengthen their connection to their whenua, awa.
- Whanau appreciated the knowledge and information shared by the mauri team and in particular, enjoyed the learning gained from Garth Harmsworth who was taken to the stream and gave some useful insights and advise on how they might develop their restoration plan.

Figure 7.1 Image of whanau, November wananga and site visits to the stream

The final section are the conclusions of the report and some thoughts for the HBRC to consider as they contemplate a pathway forward.

8. Conclusions

The government is currently intending to reform New Zealand's fresh water management system which will have implications for Māori marae, hapū, iwi and Māori communities nationwide. The National Policy Statement for Freshwater Management 2011 requires that councils set freshwater objectives for freshwater bodies that reflect national and local aspirations, and to set flow, allocation and water quality limits to ensure those objectives are achieved. It also requires councils to manage efficiently within those limits, avoid over-allocation and address existing over-allocation. Councils must manage land use and water in an integrated way and involve Māori marae, hapū and iwi in freshwater decision-making.

At regional and catchment level the councils will be seeking to work with marae, hapū and iwi to achieve a common understanding of the uses, values and challenges around local water bodies, and agree on common aspirations and actions. The HBRC has initiated this pilot study in response to the reforms for fresh water management and the RMA reforms. There is an opportunity for the council to develop more integrative approaches in freshwater management.

The mauri monitoring framework presented in this report provides the mechanisms, process and practical guidelines for the Council in the development of integrative approaches that need to incorporate Māori world views, perceptions and cultural values.

'Te Hā o Te Wai Māreparepa' - meaning the breath of the rippling waters, is the name given to the mauri monitoring framework developed. The mauri monitoring framework provides both a philosophical and practical analysis for how mana whenua marae and hapū can restore, enhance and increase the potent life force energy of mauri for people and their natural world.

Mātauranga – tikanga based assessment monitoring frameworks express Māori values of importance to mana whenua localised to their traditional lands where the marae and hapū is potentially at their most potent. This provides the appropriate mātauranga Māori knowledge and practises which can be integrated with science knowledge – to organise, collect, analyse, interpret, and report indicators to monitor the shifts and changes in mauri; to respond to issues, inform planning and policy, plan actions, and underpin the long-term sustainable management of their streams and other taonga.

The mauri monitoring framework has articulated a clear seven step Wai māreparepa process with the capacity to strengthen whanaungatanga and to influence, energise and to motivate mana whenua marae and hapū into action for change. The journey can be arduous, painstakingly long and enormously challenging for marae and hapū struggling with multiple layers and complexities in the modern world. However, there must be full expression or voice given to articulate the issues and concerns for Māori and to identify priorities and action with the power to revitalise and transform marae and hapū as they strive to achieve their aspirations.

The mauri monitoring framework has the capacity to be innovative in creating solutions which can integrate alternative approaches, methods and practices to achieve common goals and aspirations. There is sufficient merit for the mātauranga- tikanga based assessment framework to have universal appeal for other marae and hapū. The 'Te Hā o Te Wai Māreparepa' philosophy underpinning the framework is to create ripples and waves that connect everybody and every living thing and can be a driving force for action and change.

Appendix One

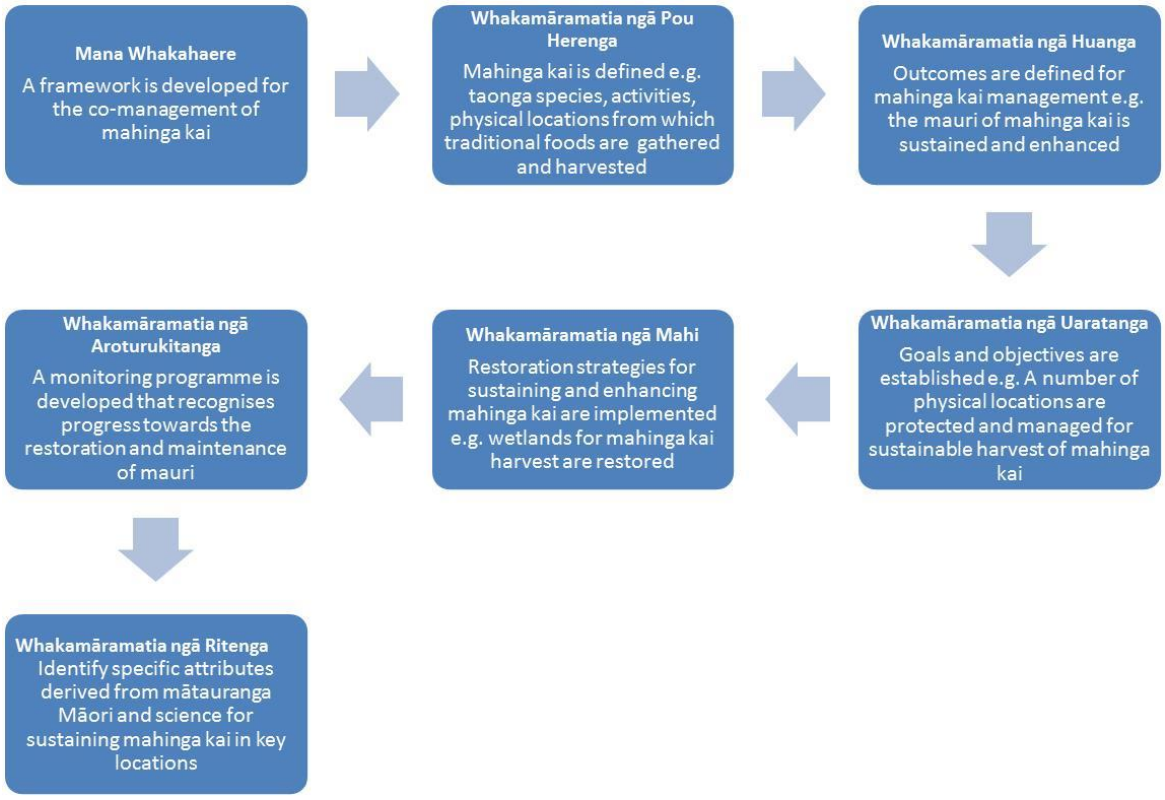
Developing a Template for Collaboration Co-Management

Introduction

Marae and hapū values can inform all aspects of policy and planning for improving restoring and enhancing the mauri of taonga in freshwater management. It is essential to create a robust, consistent, and replicable process to support the engagement of marae and hapū in the management, decision-making, planning, and policy development for freshwater ecosystems. This ensures mana whenua values and interests are identified and reflected in freshwater management.

Awatere et al.[32] identified six key steps to underpin collaboration and co-planning with marae and hapū (and iwi) in freshwater management and is outlined in Figure One (below):

Figure One: A generic tikanga-based framework for freshwater planning and management



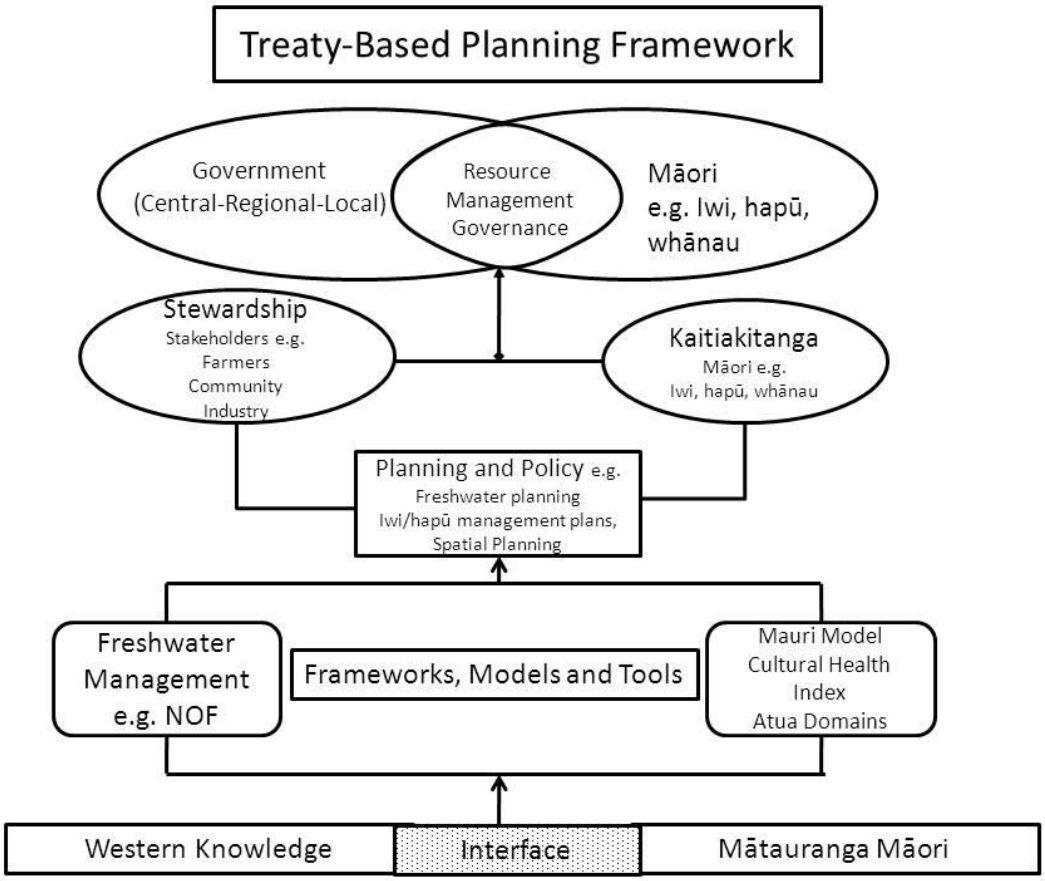
A more detailed description of each step (in the tikanga framework) is given below.

[32] Awatere, S., Harmsworth, G & Pauling, C. (2013*). Using mātauranga Māori to inform freshwater planning*. Lincoln, Landcare Research.

1. Mana Whakahaere: A Treaty-based planning framework is used for engagement and policy development

A Treaty framework for developing freshwater management policy for central/local government informed by mātauranga Māori is outlined in Figure Two:

Figure Two: Treaty based planning framework



At the core of the framework are key Treaty of Waitangi principles, including reciprocity (recognition of the essential bargain), rangatiratanga (authority, self-determination), shared decision-making, partnership, active protection, and ōritetanga (mutual benefit, the right of development and redress).

Reconnecting, rebuilding, and maintaining relationships between marae, hapū and local government are essential for helping local government recognise the relevance of mātauranga Māori in contemporary resource management. These are culturally appropriate tools that can be clearly understood, communicated, and applied are key to this uptake by local government, developers, and other stakeholders. The framework provides guidance on how Māori interests and values can help inform regional planning objectives and policies for freshwater management in local government plans.

Along with documentation of issues and objectives, policies informed by Māori interests and values will result in an integrating and holistic outcome, as sought by Māori. At the same

time the establishment of joint projects (with appropriate funding) between local government and hapū and marae that give effect to the relationship in tangible ways for both parties are essential.

2. Whakamāramatia ngā Pou Herenga: Tangata whenua values (Metaphysical and Physical) e.g. Whakapapa, Kaitiakitanga, Mahinga Kai and Manaakitanga are defined and reflected in engagement processes

Identifying and understanding key Māori values are important for involving hapū and marae in freshwater management and for ensuring mana whenua values and interests are identified and reflected in engagement processes. Māori values, derived from the traditional belief system, are part of the wider Māori knowledge system, and can be defined as instruments through which Māori make sense of, experience, and interpret the environment. Māori values can be represented in many forms:

- in the environment as places or sites of significance; the basis for recognising Māori treasures (taonga), such as iconic flora and fauna species, significant biodiversity, mahinga kai and environmental issues;
- in the language; through relationships between people or organisations; and the intrinsic cultural basis for controlling or modifying human behaviour, forming the principles and ethics by which we live and advance.

3. Whakamāramatia ngā Huanga: Shared outcomes are defined at the beginning of the engagement process

It is critical to define the desired outcomes at the beginning of the engagement process. An emerging definition for a Māori-defined outcome is "A desired or agreed end point, goal, vision, often within some time-frame – can be a Māori whakatauki (proverb)".

4. Whakamāramatia ngā Uaratanga: Goals and objectives are established

Involvement of hapū and marae in freshwater management is integral to meeting the Crown's responsibilities under the Treaty. Broader statutory obligations such as those in the National Policy Statement on freshwater management (2011) and the Resource Management Act (1991) are useful for helping to shape objectives for planning and policy. Some examples of objectives are:[33]

1. To restore/sustain/enhance the mauri of freshwater ecosystems in ways that enable provision for the social, cultural, and economic well-being of Māori, particularly in the following areas:
    a) Estuaries and harbours: protection of ecosystems and habitats used for cultural purposes and activities, including recreation, fishing and shellfish gathering, kaimoana, mahinga kai, cultural practice;
    b) Catchment ecosystems that sustain cultural values and life-supporting connectivity's and relationships to communities;

[33] Harmsworth, G., Dixon, L & Awatere, S. (2011). Review paper*: Improved reporting tools – Māori cultural monitoring approaches throughout Aotearoa*. Lincoln, Landcare Research.

c) Groundwater and aquifers, including all special cultural sites such as Waipuna – springs for sustainable cultural use and water supply;
d) Lakes, rivers and streams: protection of freshwater ecosystems and cultural values, food gathering, recreation, water supply, for distinct cultural and spiritual use and practice;
e) Wetlands: protection of wetland ecosystems for their distinct cultural values, use, and taonga;

2. To protect, manage, and enhance cultural sites and areas of cultural importance (e.g. wāhi tapu, wāhi taonga, mahinga kai).

5. Whakamāramatia ngā Mahi: Actions on the ground that demonstrate kaitiakitanga and progress hapū and marae towards their goals/objectives/aspirations through tangible projects

An increasing number of hapū, marae and iwi projects are being used to express values and achieve hapū, marae and iwi collective goals and objectives. These actions are used to reinforce mātauranga Māori, cultural activities, and uses within a region, tribal rohe or catchment and include examples such as restoration and enhancement of wetlands and mahinga kai, riparian planting, protection and maintenance of cultural sites, and long-term sustainability of taonga *spp*. and habitats (e.g. tuna, inanga, harakeke). Actions and projects are used to strengthen the inter-connection hapū and have with freshwater ecosystems and catchments. Many hapū, marae and iwi groups are increasingly developing collaborative projects with councils for agreed joint work programmes with defined goals, budgets, timeframes, and responsibilities. Step 6 monitoring can be used to assess whether these projects are making a difference and making progress towards stated or expected outcomes.

6. Whakamāramatia ngā Aroturukitanga

Step 6 is the stage at which monitoring approaches, tools, and methods such as the CHI, cultural flows, and Ngā Atua domain framework are developed and implemented. These can then be used to assess progress of hapū and marae goals and objectives (towards outcomes, aspirations) at step 6.

Appendix Two:

Mātauranga and Tikanga based Cultural Monitoring Frameworks

a) Mauri of Waterways Kete: the Mauri of Waterways Kete or monitoring framework is an extremely useful framework with potential application for improving and enhancing mauri. The kete was developed by Jefferies and Kennedy as part of the FRST programme, planning under a Co-operative mandate (PUCM). The aim of the Māori work stream in the PUCM project was to develop mātauranga Māori-based planning tools for uptake by hapū and marae within a resource management-planning regime. Because it is based on resource management planning processes and grounded in Māori values we believe the Kete is a tool that can be readily applied and used to improve the mauri health state.

Table One: Framework applied to the mauri of waterways for mahinga kai

Outcome	*Mauri of Mahinga Kai are in optimum health*	
Kaupapa	*Mauri*	
Tikanga	*Mauri of Mahinga Kai*	
Indices	**Indicators**	**Measures**
Extent to which local authorities protect mauri	Whether respondent agrees that Territorial Local Authority actively protects mauri Whether Territorial Local Authority documents contain provisions to protect mauri Whether Territorial Local Authority act to protect mauri	Ordinal Ranking, e.g. "Strongly agree" to "Strongly disagree" scale
Extent to which tangata whenua protect mauri	Whether respondent agrees that tangata whenua actively protect mauri Whether tangata whenua have management documents with provisions designed to protect mauri Whether tangata whenua act to protect mauri	Ordinal Ranking, e.g. "Strongly agree" to "Strongly disagree" scale
Extent to which other agencies protect mauri	Whether respondent agrees that other Government agencies actively protect mauri. Whether agency takes measures to foster understanding of mauri. Whether agency has strategies designed to protect mauri.	Ordinal Ranking, e.g. "Strongly agree" to "Strongly disagree" scale
Extent to which actions of the wider community affect mauri	Whether respondent agrees that actions of the wider community affect mauri Extent to which individuals and groups are informed about mauri and how it should be protected. Whether individuals and groups take active measures to protect mauri	Ordinal Ranking, e.g. "Strongly agree" to "Strongly disagree" scale
Physical evidence that mauri is protected	Whether respondent agrees that mauri is protected. Characteristics of the mahinga kai Characteristics of the mahinga kai and it's immediate environment Characteristics of mahinga kai inhabitants Presence of potential human threats	Ordinal Ranking, e.g. "Strongly agree" to "Strongly disagree" scale CHI Water Flow MCI, etc..

b) The cultural flows preference study has been developed by Tipa and Nelson to assess the impacts of stream flow on a number of attributes based on iwi/hapū preferences. Tipa and Nelson identified the following steps required to involve iwi/hapū in setting flow regimes:

1. Initiating the project by identifying the body representing Māori and secure mandates

2. Documenting the association: identifying mahinga kai/ecosystem attributes related to stream flow and iwi/hapū preferences

3. Cultural opportunity mapping: identifying sites of significance and assessing the impact of stream flows on these significant areas

4. Focusing the investigation: critically assess and identify iwi/hapū mahinga kai/ecosystem attributes that can be applied to an Environmental Flow Assessment (EFA) and those mahinga kai/ecosystem attributes that may be more suitable for assessment by alternative methods

5. Cultural opportunity assessments: to undertake assessments at sites to assess whether different levels of environmental flows sustain iwi/hapū attributes and provide the opportunities sought.

6. Analysis to inform decision-making: qualitative analysis and statistical analysis to identify flow thresholds, flow related issues, and management priorities.

The study identified a list of attributes for ecosystem and iwi/hapū well-being derived from stream flow. This is a key part of the process because it enabled iwi/hapū preferences for ecosystem health to be identified based on issues that were of concern to them. The process is useful because it also helps set the context for the modelling, resulting in quantitative data informed by mātauranga Māori. The process is ideal because it has avoided the explicit quantification of mātauranga Māori, instead outputs from a scenario model present data based on attributes derived from Māori ways of knowing.

Each attribute has an ordinal ranking system from 1 (little or no satisfaction), 4 (Moderate satisfaction) and 7 (very satisfied), which is determined by an iwi/hapū assessor. Some of the attributes include:

- Flow enables use of the site as a mahinga kai
- Flow protects mahinga kai species in and around this site
- Flow enables whanau to be proud of this site
- Flow enables use of the river for health and well-being purposes

There is significant potential for this method to be applied to assessing the mauri of fresh waterways such as the Papanui stream, particularly at the stage of identifying culturally appropriate measures or indicators for assessing progress towards outcomes. The method is also applicable to any awa where the regulating authority controls the flow of streams or rivers, like the Waikato River. The Cultural Flows method may be part of a suite of indicators that form a monitoring component of a mauri monitoring assessment planning process.

The Mauri Compass

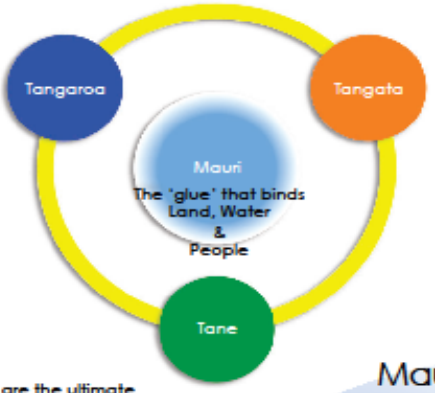
TE RUNANGA O TURANGANUI A KIWA

The Mauri Compass*

A Concept Paper showing the Mauri Compass* as an Evaluation Tool in a RMA Freshwater Context

Developer: Ian Ruru
Te Runanga o Turanganui a Kiwa Environment Policy Advisor

Problem Statement: As part of the development of the Regional Freshwater Plan, Council has identified that the issue of understanding the current state of Mauri of freshwater bodies is something which needs further research.
Mauri is a key value for which freshwater in the Gisborne Region and Waipaoa Catchment. Council aims to maintain mauri as part of its management of freshwater, and to work with iwi to restore Mauri where it has been diminished.
Local Iwi representatives have identified that tuna are an appropriate Sentinel (bio-indicator) of mauri in Waipaoa Catchment waterbodies.

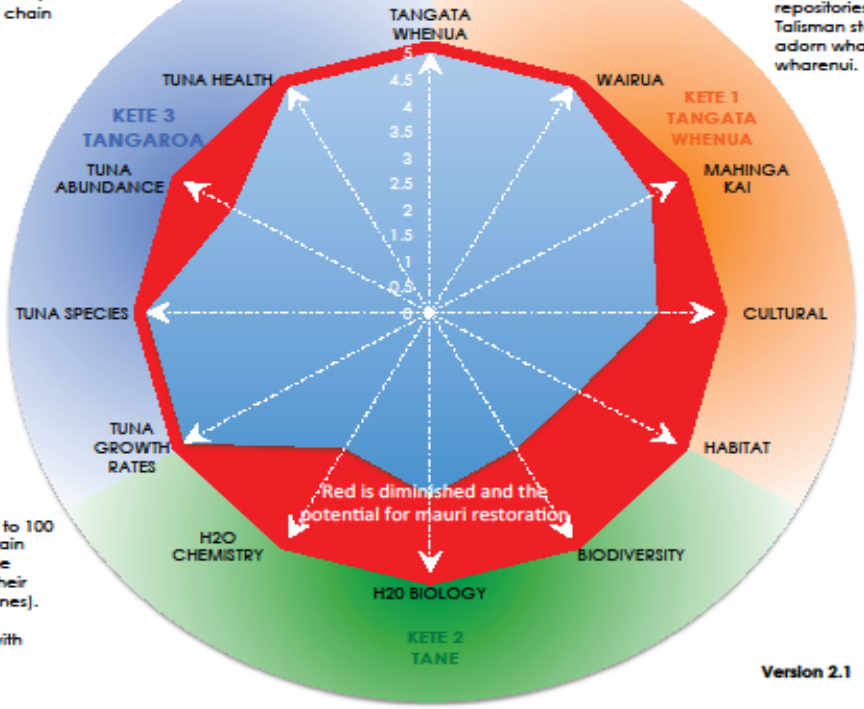


The "Whakapapa" of the Mauri Compass*
Toitu te Marae o Tane
Protect and Strengthen the Realm of Tane (Land)
Toitu te Marae o Tangaroa
Protect and Strengthen the Realm of Tangaroa (Water)
Toitu te Tangata Whenua
Only then will the People Flourish

Compass knowledge is stored inside the three Kete of Tangata Whenua, Tane and Tangaroa.
Kete 1 Tangata Whenua values, Wairua, Mahinga Kai, & Cultural recognition of tuna.
Kete 2 Tane: Land-based effects on the tuna environment.
Kete 3 Tangaroa: Focus on tuna health, abundance, species composition and growth.
"A COMPASS TO NAVIGATE...THE JOURNEY TO RESTORING THE MAURI...A PATHFINDER FOR KAITIAKI.

Tuna are the ultimate freshwater Sentinel, the 'Apex Predator', top of the food chain and bio-accumulator.

Mauri Compass* for a theoretical Water Body



Culturally, tuna are from Hawaiki and Pa Tuna were repositories for Mauri Talisman stones. Tuna adorn whakairo and wharenui.

Tuna live for up to 100 years and contain the history of the catchment in their otoliths (ear stones). **Tuna** are a USB Memory Stick with fins.

Version 2.1

The Mana Whenua Framework Te Kōhao o te Ngira

An example of a mātauranga Māori-based planning framework is Te Kōhao o te Ngira, a Mana Whenua-based framework that aims to guide all decision-makers in the Auckland Region – Mana Whenua (rohe and takiwa level) and Government (central, regional & local level) – in responding to regional changes, thereby supporting the collective sustainability of the region (Tāmaki Regional Mana Whenua Forum 2007). Te Kōhao o te Ngira is a regional Mana Whenua perspective of sustainability, drawn from the collective worldviews of hapū and iwi across the region who have lived here mai rā anō (for a long time).

Te Kōhao identifies aspirations and reflects a Mana Whenua vision for Tamaki Makaurau, of the past and of the future. The Mana Whenua-based framework provides for:

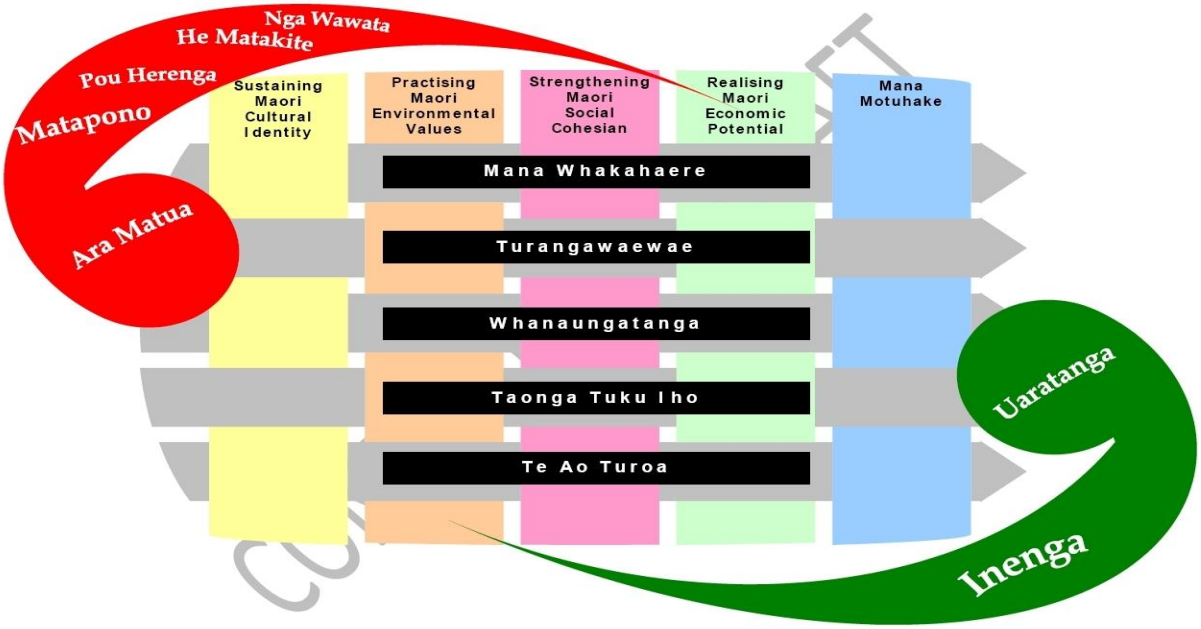
- **Ngā Wawata (Aspirations)** of Mana whenua, underpinned by their relationships with land, people and the wider environment
- **He Matakite (Vision)** of an abundant and prosperous region
- **Ngā Pou Herenga (Values)** that underpin and drive the framework
- **Ngā Mātāpono (Guiding Principles)** that guide decision-making and underpin the relationships between people; between people and the land; between people and the environment
- **Ngā Ara Matua (Key Directions)** that identify priority areas for Mana whenua that will help focus relationships and initiatives aimed at the long-term sustainability for both the region and Mana Whenua
- **Ngā Uaratanga (Long-Term Goals)** that support Mana Whenua (takiwa and rohe) and government (central, regional and local) to develop responses
- **Ngā Inenga (Indicators and Measures)** [to be developed] to monitor progress and success against the priority areas and goals

Ngā Huanga (Outcomes) inclusive of the four areas of well-being from a Mana Whenua perspective, where mana motuhake espouses the positive and inclusive outcome of all strategies and initiatives.

We believe this culturally appropriate planning framework can be adapted for the Mahinga Kai project. The framework was developed by Mana Whenua in Tāmaki Makaurau, including Mana Whenua with whakapapa ties to Waikato/Tainui, so the key directions – (Mana Whakahaere (decision-making authority), Turangawaewae (rights to access), Whanaungatanga (sustainable communities), Taonga Tuku Iho (intergenerational equity), and Te Ao Tūroa (sustainable environment) – ought to have resonance. Furthermore, it has relevance for Waikato/Tainui, given that the name of the framework, Te Kōhao o te Ngira, refers to the proverb by the first Māori King, Pōtatau Te Wherowhero;

> Kotahi te Kōhao o te Ngira e kuhuna ai te miro ma, te miro pango te miro whero. A muri kia mau ki te whakapono, kia mau ki nga ture, kia mau ki te aroha (*There is but one eye of the needle through which must pass the white thread, the black thread and the red thread. Hold fast to faith, hold fast to the laws, hold fast to the love*).

Te Kōhao o te Ngira



Te Mauri Model

The model was initially developed by Morgan (2007) for engineering purposes but has also been used in many other situations and has wide application.

The method demonstrates how the principle of mauri can be used to understand the inter-relatedness or inter-connectedness of all living things, and to measure sustainability and well-being. The model is a framework and assessment method developed to integrate across the dimensions of economic, social, cultural, which are successive subsets of the environment. These are redefined from an indigenous perspective to measure the impacts of the mauri in 4 key indigenous aspects: ecosystems (environmental), hapū (cultural), whānau (economic), and communities (social). The model's aim is to assist decision-making, understand the impacts on the intrinsic values of ecosystems, and show the inter-relatedness between sustainability dimensions. It therefore helps improve resource management and socio-cultural outcomes by:

- measuring impacts on cultural, social, economic and environmental dimensions from an indigenous perspective
- integrating te ao Māori values and knowledge into western models of sustainability
- analysing both institutional and environmental performance

The assessment methods are used to assess the impacts from certain (anthropogenic) activities or practices on the mauri by giving scores and weightings for each of 4 key ***aspects*** or ***subsets:***

- Mauri of the whānau (family, economic)
- Mauri of the community (social)
- Mauri of hapū (cultural)
- Mauri of the ecosystem (environment)

The relative importance of aspects can be addressed independently by users and decision-makers choosing a weighting applied to each aspect before scoring is completed and hierarchies developed. Impacts on the mauri can be regarded as:

- Strong
- Weak
- Exhausted

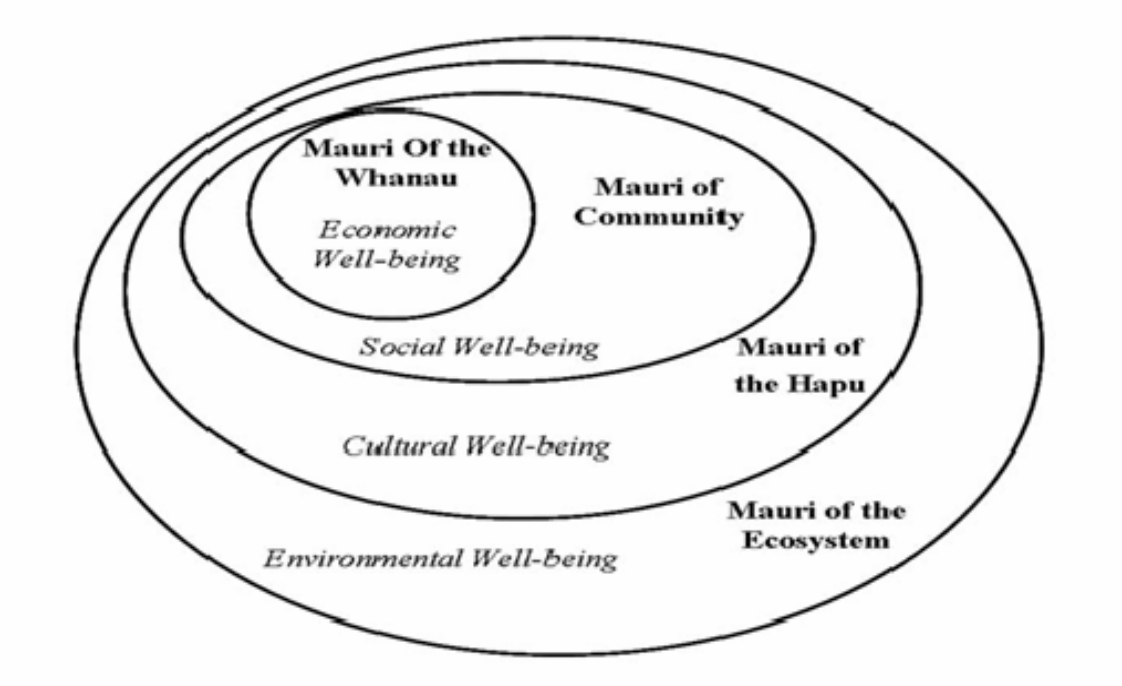
Six ratings of mauri are given for each aspect:

- Highly sustainable – 5
- Viable practice enhancing the mauri – 4
- Contributing to mauri – 3
- Neutral – 2
- Diminishing the mauri – 1
- Significantly diminishing the mauri and the resource – 0

The resulting effect of activities and practices on the mauri will be seen as –2, destroyed mauri (*mauri mate*); –1, diminishing mauri (*mauri noho*); neutral; +1, maintaining mauri (*mauri mahi*); +2, enhanced mauri (*mauri ora/kaha*). Evaluation methods identify whether an option/development/practice is:

- enhancing
- diminishing
- neutral

Figure One: Te Mauri Model



Appendix Three:

The State of the Takiwa Assessment Form

State of the Takiwā **Visit Form** **Site Code** ____

Use a separate form for Questionnaire **Visit Code** ____

VISIT DETAILS Site Name: ____ No. in Group: ____

Visit date: __/__/____ Time: __:__ am / pm Hours at Site: ____

Visitor Name: ____ ☐ First visit here? ☐ First evaluation here?

From: ____ Visit Purpose: ____

Weather Centre

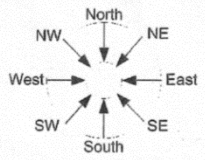
1. Temperature:
Enter 'C here ____ 'C
or
indicate approximately on scale below

Hot	25'C or more
Warm	20
Mild	15
Cool	10
Cold	5
Freezing	0'C or less

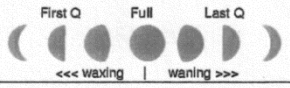
2. Cloudiness (circle one)
Clear sky
Mainly clear
Streaky
Partly cloudy
Heavy
Breaking
Overcast

3. Precipitation (circle one)
None
Mist or fog
Drizzle
Light
Moderate
Heavy
Hail
Snow

4. Wind If wind, circle its direction
(circle one)
None
Minimal
Light
Stiff or breezy
Gusty
Strong



5. Moon: Circle the shape or tick if not applicable: ☐



6. Tide: Draw a circle on the sea-level curve, or tick if not applicable: ☐

7. Extra comment on weather:

Heritage/Archeological Details Are there any signs of traditional use? Yes No

Describe signs / list observations

Site Issues or Pressures

Site Actions or Responses

Recent Flow Conditions
Circle the number best describing the past 6 weeks:

5 Stable flow
4 Brief flooding (less than 2 days)
3 Several brief floods
2 Prolonged flooding (5 days +)
1 Prolonged low flows

Recent Land Use Conditions (Up to 1 km upstream and within 500m of banks.)
List any disturbances to the stream that are noticed or known (last 6 weeks). eg stock in channel, wastes, chemicals, stormwater, weed clearance, earthworks, etc.

Photos taken? Yes No Direction facing, Photo 1: ____ Photo 2: ____ Photo 3: ____ Photo 4: ____

Use camera on 35mm or equivalent. Preferably take four photos, facing North, East, South and West, from the GPS reference point. Also consider Upstream, Downstream and of any s

Describe these photos:

OFFICE USE ONLY Entered into Takiwā database by: ____ Date: __/__/____

Site previously mapped : ☐ **Photo filed:** ☐ Filename: .....

Site mapped: ☐ TUMONZ/GIS code: .....

WINZ Report: RE500_VisitForm Wednesday, 5 May 2010 10:33 p.m. Page: 1 of 1

State of the Takiwā **Site Definition Form** **Site Code** _____

Site Name _____ Defined by _____ on __/__/____

Assessment type: (tick one) ☐ New site ☐ Update

Region of NZ _____ *eg Otago* Catchment/Feature _____ *eg Waiau River*

Zone (tick one) ☐ Mountains ☐ Hills ☐ Upper Plains ☐ Mid Plains ☐ Lowland Plains
☐ Urban ☐ Coastal/marine ☐ Other. Specify: .....

Ecosystem Types ☐ Alpine ☐ Native forest ☐ Exotic forest ☐ Tussock/dryland ☐ Farm/agrisystem
☐ River/Stream ☐ Lake/Wetland ☐ Estuary/Lagoon ☐ Coastal/Dune ☐ Marine
☐ Other. Specify: .....

Ownership: ☐ Private ☐ Council ☐ DOC ☐ Maori ☐ LINZ
☐ Crown ☐ Unknown ☐ Other. Specify: .....

Mana Whenua _____

Site Description (100m radius. Including site issues, pressures and general notes):

Legal Protection: ☐ Informal/none ☐ Reserve ☐ NZAA site/silent file ☐ Legal covenant ☐ Conservation
☐ Other. Specify: .....

Settlement Site: ☐ Nohoanga ☐ Topuni ☐ Tribal property ☐ SA ☐ Unsure

SITE-SIGNIFICANCE DETAILS Is this a traditional site? Yes No Unsure Are there any signs of traditional use? Yes No

Significance of site: ☐ Urupa ☐ Pā/Kāinga ☐ Mahinga kai ☐ Wāhi Pakanga ☐ Other

Please explain site significance / List any observations:

Traditional Abundance List species and resources traditionally known to be present at this site.

NGĀ MANU / BIRD SPECIES	Abundance
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots

NGĀ IKA / FISH SPECIES	Abundance
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots

NGĀ RAKAU / PLANT SPECIES	Abundance
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots

OTHER TAONGA / Natural Resources	Abundance
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots
	Few Some Lots

Geographical Position Area (sq m) _____ Altitude (m) _____ Map No (if 260 series) _____

East _____ North _____ Accuracy/Offset (m) _____

Photos taken? Yes No Direction facing, Photo 1: _____ Photo 2: _____ Photo 3: _____ Photo 4: _____

Use camera on 35mm or equivalent. Preferably take four photos, facing North, East, South and West, from the GPS reference point. Also consider Upstream, Downstream, etc.

Describe these photos:

OFFICE USE ONLY Entered into Takiwā database by: _____ Date: __/__/____

Photo filed: ☐ Filename: .....

Site mapped: ☐ TUMONZ/GIS code: .....

State of the Takiwā **Site Assessment - General** **Site Code** ____

A Visit form is also needed **Assessment Code** ____ **Visit Code** ____

ENTRY DETAILS Site Name: ____ Visit date: __ __ / __ __ / __ __ __ __

Visitor Name: ____ Number of people represented: ____

A. SITE ASSESSMENT DETAILS For each question, please circle the appropriate number, then explain it in the box following.

1. How would you describe the pressure on this site? Immense presure 1 2 3 4 5 Minimal pressure

   Details (including recreational access, surrounding landuse, discharges, etc.):

2. What is the degree of modification/change at this site? Extreme modification 1 2 3 4 5 Low modification

   Details (including drainage, burning, discharges, abstractions, developments):

Questions 3, 4, 5 and 6 consider suitability for harvesting mahinga kai *(Q3, 4 & 6 are shared with CHI questions.)*

3. Do you consider access to this site is sufficient to harvest mahinga kai? Not able to gather 1 2 3 4 5 No restrictions

   Details:

4. Would you harvest mahinga kai at this site? Definitely no 1 2 3 4 5 Definitely yes

   Details:

5. Tick if site is wāhi tapu: ☐

6. Would you return to this site in the future? Yes No

   Details:

7. What actions are required to improve the health of this site? Tick relevant boxes.

   ☐ Better management by landowner, council, etc.
   ☐ Consideration of ownership/purchase by tribe/rūnanga.
   ☐ Protection / Access arrangement for significant sites with landowner
   ☐ Interpretation / Signage
   ☐ Restoration of native species
   ☐ Pest / weed control

   Anything else:

8. How would you describe the overall health of this site? Very unhealthy 1 2 3 4 5 Very healthy

   Details (including any problems, pressures, issues, smells etc. noticed):

Next page for Abundance questions ...

State of the Takiwā

SHMAK Assessment

Site Code

SHMAK Assessment Code

Visit Code

ENTRY DETAILS Site Name:

Visit date: __ __ / __ __ / __ __ __ __

Visitor Name:

Number of people represented: __ __

From:

A. STREAM HABITAT

Please enter answers in boxes. You can do the calculations and circle the scores if you want, or leave that task to be done automatically later in the database.

A1 Habitat Quality

1. Flow velocity Time an object travelling down the centre of the stream (do 3 times): ____ ____ ____ seconds

Distance travelled: ____ metres Divide distance by the average time of ____ seconds

... to get an average velocity of ____ m/sec

eg. For 10m in 38s
Velocity = 0.26 m/s
Score = 8

From the velocity:	less	0.1	0.3	0.7	1.0	more
Circle the score:	1	8	10	5	3	

2. Water pH ____

From the pH:	less	5	6	7.5	9	more
Circle score:	-5	5	10	5	-5	

3. Water temperature ____ °C

Time of day: ____

Temp:	less	5	10	15	20	25	30	more
Score:	5	8	10	8	5	1	-5	

4. Water conductivity ____ uS/cm

Cond:	less	50	150	250	400	more
Score:	20	16	10	6	1	

5. Water clarity (Take 3 readings): ____ ____ ____ cm Calculate average clarity: ____ cm

Note: for ease of use, scale is in opposite order to that in SHMAK doc. ('more' here means 'clear to bottom')

Clarity:	less	35	55	70	100	more
Score:	1	3	5	8	10	

A2 Composition of the Stream Bed *

Estimate materials making up the stream bottom (to nearest 10%).

		Enter %	Score
Bedrock			-10
Boulders	> 25 cm		10
Large cobbles	12 - 25		20
Small cobbles	6 - 12		10
Gravels	0.2 - 6		0
Sand			-10
Mud or silt			-20
Man-made, eg concrete			-20
Woody debris			0
Water plants, rooted in stream bed			0
Check you have 100%			

A4 Bank Vegetation *

True left = left bank looking downstream

Estimate vegetation within 5 metres of the banks (to nearest 10%)

	%, true left	%, true right	Score
Native trees			10
Wetland vegetation			10
Tall tussock grassland, not improved			8
Introduced trees (willow, poplar)			8
Other introduced trees (conifers)			5
Scrub			5
Rock, gravels			5
Short tussock grassland, improved			3
Pasture grasses and weeds			-10
Bare ground, roads, buildings			-10
Check you have 100%			

A3 Deposits

Tick best estimation of loose deposited material on the stream bed

			Score
None noticed			10
Fine, mainly by edge	thickness < 1 mm		5
Moderate, edge & elsewhere	1 - 3 mm		0
Moderate to thick, patchy, most of bed	3 -5 mm		-5
Thick, most horizontal surfaces	> 5 mm		-10

* NOTE: For A2 and A4 the relative scores are shown but percentage-weighted calculations can't be calculated here.
Use the database to automatically do this and get an overall score for each.

State of the Takiwā **CHI: Cultural Stream Assessment** **Site Code** _____

Use general assessment code if have one >> **Assessment Code** _____ **Visit Code** _____

ENTRY DETAILS Site Name: _____ Visit date: ___/___/_____

Visitor Name: _____ Number of people represented: ___

A. Cultural Stream Health Assessment For each question, please circle a number.

	Unhealthy		Healthy
1. Catchment Land Use	Land heavily modified Wetlands and marshes lost	1 2 3 4 5	Appears unmodified
2. Vegetation - banks & margins (100m either side)	Little or no vegetation - neither exotic nor indigeneous	1 2 3 4 5	Complete cover of vegetation - mostly indigenous
3. Use of the river banks & margins (100m either side)	Margins heavily modified	1 2 3 4 5	Margins unmodified
4. Riverbed conditions (sediment)	Covered by mud, sand, slime or weed	1 2 3 4 5	Clear of mud, sand, slime and weed
5. Changes to river channel	Evidence of modification, eg stopbanks, straightening, gravel removal, shingle build-up	1 2 3 4 5	Appears unmodified
6. Water Quality, eg foams, oils, slime, weeds, etc.	Appears polluted	1 2 3 4 5	No pollution evident
7. Water clarity	Water badly discoloured	1 2 3 4 5	Water is clear
8. A variety of habitats	Little or no current, uniform depth and limited variety of flow related habitats	1 2 3 4 5	Current and depth varies, creating a variety of flow related habitats
9. Overall health of the river at this site	Very unhealthy	1 2 3 4 5	Very healthy

Please explain your answer:

B. MAHINGA KAI SPECIES For each question, please list the species that you can see or hear. You can use a blank page to list more if necessary. (Alternatively, complete the General Assessment B1 and B2 sections.)

BIRDS: Please list the mahinga kai bird species that you can see at this site

1.	2.	4.	3.
5.	6.	7.	8.

PLANTS: Please list the mahinga kai plant species that you can see at this site

1.	2.	4.	3.
5.	6.	7.	8.

C. SITE ACCESS FOR HARVESTING MAHINGA KAI *(These questions also appear as Q3, 4 & 6 on the General Assessment form.)*

Do you consider access to this site is sufficient to harvest mahinga kai?

Not able to gather at this site 1 2 3 4 5 Able to gather - no restrictions

Please explain your answer:

Would you return to this site in the future? Yes No

OFFICE USE ONLY Entered into Takiwa database by: _____ Date: ___/___/_____

Appendix Four:

Ngā Atua Domain Assessment Form

MAURI INDICATORS FORM - PAPANUI STREAM (SITE 3)

(Only snapshoot of current situation i.e. health of our Taonga Tuku Iho)

Name of Waterway:	**Landholder:** DoC, Public, Private, Other			
Catchment:	**Adjacent landuse:** 1 Pasture 2 Horticulture 3 Native 4 Exotic forest 5 Scrub 6 Residential 7 Commercial 8 Industrial 9 Recretional			
Site Number:	(Circle as appropriate)			
Date:	**Site Status:** A Traditional B Non Traditional			
Time:	**Mahinga Kai:** 1 Present 2 Absent			
Coordinates:	**Future:** 1 Will return to manage 2 Wouldn't return			
Name:				
TANGAROA	Rating 1-5	Rating 1-5	Rating 1-5	Comments
1. Riverbank Condition				
2. Sediment on Riverbed				
3. Water Clarity				
4. Water Flow				
5. Water Quality/Wainui*				
6. Shape and Form of River				
7. Insect Life (method, no. & species)				
8. Fish (method, no. & species)				
TĀNE MAHUTA	Rating 1-5	Rating 1-5	Rating 1-5	Comments
9. Riparian Vegetation				
10. Catchment Vegetation				
11. Bird Life (method, no. & species)				
12. Ngahere/Taonga				
13. Pest plants/animals				
HAUMIA TIKETIKE and RONGO MATĀNE				
14. Mahinga Kai (no. & species)				
15. Rongoā (no. & species)				
TŪMATAUENGA	Rating 1-5	Rating 1-5	Rating 1-5	Comments
16. Use of River				
17. Use of River Margins				
18. Access to River				
19. Cultural Site	(Yes/No) Type			
TAWHIRI MĀTEA	Rating 1-5	Rating 1-5	Rating 1-5	Comments
20. Smell of River				
21. Weather				
OVERALL HEALTH – ORA	Rating 1-5	Rating 1-5	Rating 2-5	Comments
22. Feeling in puku				

Attachments:
Photos: Y/N
Map: Y/N
Drawings: Y/N

Comments/Recommendations:

RATINGS

0 NA, Minimal, Mauri Severely Damaged, Taonga Almost Non Existence
1 Very Poor Quality, Severely Degraded, Minimal Numbers of Taonga Species
2 Poor Quality, Some Evidence of Taonga Species, Health State Needs Improvement
3 Satisfactory Number of Taonga Species, Reasonable Health State
4 Stocks of Taonga Above Average, Reasonable Abundance, Health State Very Good (ie Healthy Regrowth Vegetation)
5 Optimal Health State Usually Taonga Species in Original State

* Maori Classes of Water:
Waiora - Purest Form of Water Grade 5
Waimaori - Freely Running Water - Grade 3-4
Waikino - Polluted, Spoilt Water Grade 2
Waimate - Water Lost Mauri or Life Force Grade 0-1

Indicator	Examples for rating 1 to 5, Questions to assist in decision making, Notes on sampling methods
TANGAROA	
1. Riverbank Condition	1 ~ Human induced erosion / modification 5 ~ No human induced erosion / modification
2. Sediment on Riverbed	1 ~ Covered in slime / mud / sand / sediment / weed 5 ~ Clear of slime / mud / sand / sediment / weed
3. Water Clarity	1 ~ Water is badly discoloured 5 ~ Water is clear
4. Water Flow	1 ~ The flow sounds dead / monotone 5 ~ The flow sounds alive / many tones
5. Water Quality	Q ~ Would you drink the water, eat fish from it, swim in it? 1 ~ Appears polluted by foam, oil, slime, weed etc. No way would I drink it! 5 ~ No pollution evident. Water is more than suited to drinking.
6. Shape and Form of River	Q ~ Are there a variety of habitats, pools, riffles and rapids? 1 ~ Little or no current, uniform depth. 5 ~ Current and depth varies, a variety of different flow related habitats.
7. Insect Life	Outline sampling method i.e. Observation over 10 minutes of flying insects i.e. Lifted 5 rocks and noted insects' present in-stream. Note species and numbers.
8. Fish Species	Outline sampling method i.e. Electric fishing, spotlighting, netting etc. Note species and numbers.
TANE MAHUTA	
9. Riparian Vegetation	Q ~ Is there vegetation present within 20m of a stream or 50m of a river. And does it shade the waterway? 1 ~ Little or no riparian vegetation – neither exotic or native 5 ~ Complete cover of mainly native vegetation
10. Catchment Vegetation	Q ~ What is the mix of Pasture, Horticulture, Native, Exotic Forestry, Other? 1 ~ Only one or two types of exotic vegetation 5 ~ Wide variety of native or native/exotic vegetation
11. Bird Life (Manu)	Outline sampling method i.e. Observation over sampling time i.e. Observation over 10 minutes. Note species and relative numbers. Is the bird song weak or strong?
12. Ngahere Taonga	Note main plant species. Are there opportunities for timber, fruit, or fibre harvest? Are trees seeding? Do plants have special characteristics/properties? Do areas include rocks/stone that has been used for cultural use? e.g. pakohe (argillite).
13. Pest plants/animals	Note species and negative effects. Has any control taken place? If so has it been successful?
HAUMIA/RONGO	
14. Mahinga Kai	Note plant, animal, fish, bird species. Are they harvestable both in quality and quantity?
15. Rongoä	Note plant species. Are they harvestable both in quality and quantity?
TÜMATAUENGA	
16. Use of River	Q ~ Is the river being used well? 1 ~ Gravel extraction is excessive, few opportunities for recreation / cultural use, fish passage is poor, vehicles are driving in river 5 ~ Gravel extraction is light or non existent, opportunities for recreation / cultural use abundant, fish passage not artificially blocked, vehicles do not have access to water
17. Use of River Margins	Q ~ Do stock have unfettered access to waterway? Is the dumping of rubbish occurring? Do Council river works maintain the mauri and wairua? 1 ~ River margins are heavily modified or overused. 5 ~ River margins are lightly modified or lightly used.
18. Access to River	Q ~ What is the legal and physical access to the river like? 1 ~ Poor legal and/or physical access 5 ~ Good legal and/or physical access
19. Cultural Site Note site type	Q ~ If the site is an archaeological /cultural site how has it been looked after? Note modifications, destruction, erosion, etc. 1 ~ Cultural site has been poorly looked after 5 ~ Cultural site has been well looked after

TAWHIRI MATEA	
20. Smell of River	Q ~ Does the river have a natural or unnatural smell? 1 ~ River has an offensive or unnatural odour 5 ~ River has a natural smell
21. Weather	1 ~ Wet and cold 2.5 ~ Overcast and mild 5 ~ Sunny and overcast
ORA/WAIRUA/MAURI	**OVERALL HEALTH**
22. Feeling in puku	1 ~ Overall gut feeling about the site is poor 5 ~ Overall gut feeling about the site is excellent
23. CHI score (Motueka)	Calculated from the average score of components 1, 2, 3, 4, 5, 6, 9, 10, 16, 17, and 20.
24. CHI score (Ngäi Tahu)	Calculated from the average score of components 2, 3, 5, 6, 9, 10, 16, and 17.

Photos	Include direction taken
Map	Include scale, north arrow, river, fences, roads, notable trees and other features
Drawings	Include drawings of any artefacts found and note destination of artefacts/kōiwi

Comments/Recommendations for improvement/Ideas for additional indicators/Action point