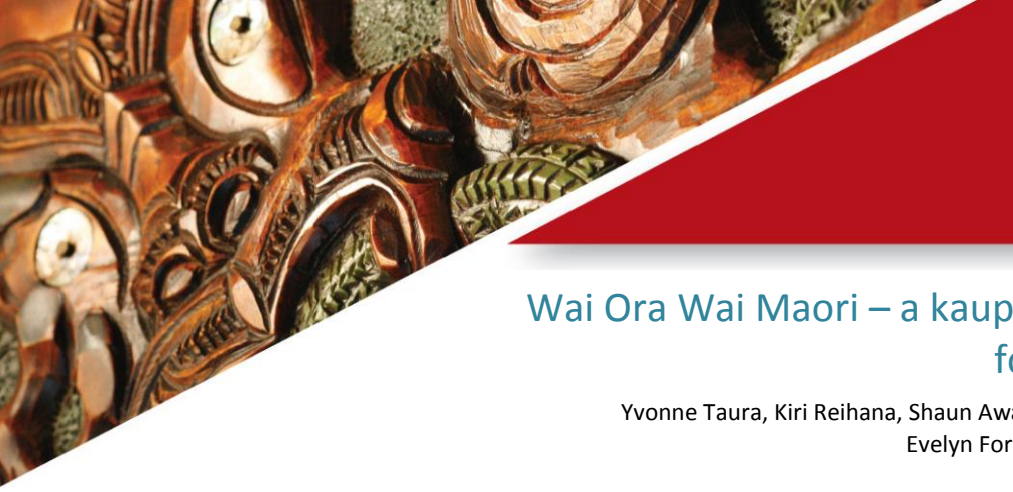

Landcare Research
Manaaki Whenua

Wai Ora Wai Maori – a kaupapa Maori assessment tool for Ngati Tahu-Ngati Whaoa

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SUMMARY

The involvement and empowerment of iwi/Maori in freshwater decision-making can be facilitated by tools that enable iwi/Maori assess the condition of freshwater. The kaupapa Maori assessment tool – Wai Ora Wai Maori – is one such tool.

The assessment tool comprises qualitative and quantitative measures for stated attributes consistent with the National Objectives Framework (NOF) bands for assessing and reporting standards and condition of selected attributes. This kaupapa Maori approach can be used to assess and articulate resource condition and impact (e.g. resource degradation, water quality, mauri) related to human activities and land management practices. It can also be used to measure and assess trends towards specific iwi/hapu goals and objectives or in relation to a stated outcome or vision for a resource or cultural significant area.

When used alongside scientifically based quantitative attributes and measures, the tool helps provide a robust, holistic, and complementary data set to inform freshwater management within a kaupapa-based assessment framework to measure progress on stated iwi/hapū aspirations and outcomes. The structure of the tool can be tailored for use by any other iwi/hapu/kaitiaki group wanting to apply their own values and attributes, while the methodology, measures, and process are consistent and generic.

We recommend that institutions developing plans and policy for improved freshwater management use this tool to improve collaboration, and to identify key attributes and measures that are meaningful and relevant to iwi/hapu groups. A meaningful partnership between institutions and iwi/Maori provides opportunities for iwi/Maori to participate effectively in all planning processes for freshwater management from technical advisory groups to governing entities. It is therefore important to have empowered, well-resourced, and well-informed iwi/Maori contributions at the core of freshwater management, particularly at the technical level where recommendations and deliverables are required.

BACKGROUND

The widespread degradation of water quality and quantity, and its state of mauri, is a significant issue for Maori. It is represented locally by widespread degradation of customary resources, extensive habitat reduction, low flows in rivers and streams, reduction in flora and fauna populations, introduction of invasive species, and poor condition of ecosystems and resources (e.g. mahinga kai, taonga species, and habitats).

To address worsening water quality and quantity issues across Aotearoa New Zealand, the Government identified a number of priorities and core objectives to improve freshwater management, including the need for collaborative planning, effective provisions for iwi/Maori involvement in freshwater planning and decision-making, and the implementation of a national objectives framework (NOF), through which societal, community, and iwi/hapu values would be determined. To protect and sustain selected freshwater values, national standards in the form of 'bottom lines or limits' for attributes and measures of water quality are being set at bands (A, B, C, D). Each band reflects different levels or attribute states, from excellent to poor, with band C/D representing the national bottom line. Regional Councils, in conjunction with communities and iwi/hapu, can set standards and limits above the national bottom line to protect and manage specific values within Freshwater Management Units (FMUs).

This research article describes a kaupapa-based assessment framework and tool to support iwi/hapu participation in setting standards and limits for freshwater. The tool enables Maori to measure progress toward or away from stated iwi/hapu freshwater aspirations and outcomes. It was developed and tested in the Waikato region (see Annex 1) and identifies freshwater values relevant for Ngati Tahu-Ngati Whaoa iwi/hapu along with their associated attributes and measures for mahinga kai.

The result is a rich mosaic of qualitative and quantitative measures that demonstrate the holistic nature of Te Ao Maori and matauranga Maori while providing a robust and holistic framework to assess and manage freshwater ecosystem health in Aotearoa.

PUMANAWA – VISION STATEMENT

The vision of Ngati Tahu-Ngati Whaoa is identified in the Iwi Environmental Management Plan, and identified as the following whakatauki to provide context for the development of the tool:

Hauora: Taiao Ora – Whanau Ora – Mauri Ora!

Health, life and well-being:

Flourishing nature – thriving families – the essence of vitality!

NGATI TAHU-NGATI WHAOA FRESHWATER DOMAINS

Three main categories or domains were identified by Ngati Tahu-Ngati Whaoa: Taiao Ora – flourishing nature (biophysical), Whanau Ora – thriving families (social), and Mauri Ora – the essence of vitality (metaphysical) (Fig. 1) and further explained in Annex 1. Within each domain two attributes were identified as integral for the assessment (Fig. 2).

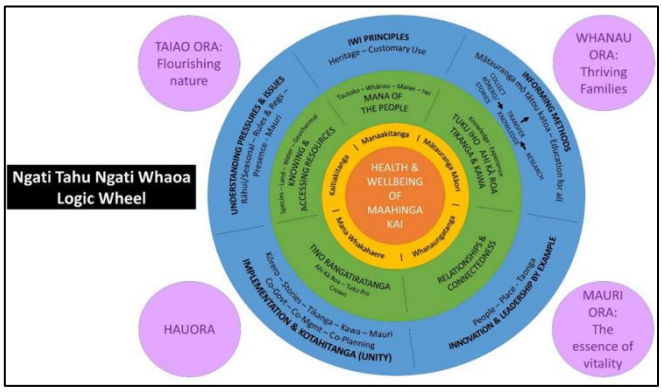

Figure 1: Logic Wheel created by Ngati Tahu-Ngati Whaoa Runanga Trust to represent mahinga kai values.

NGA UARA – ATTRIBUTES

DOMAIN: TAIAO ORA – FLOURISHING NATURE

Attribute: Is it safe to eat taonga species from this site? Taonga species like koura, tuna, and watercress are safe for human consumption.

Attribute: Do taonga species have a suitable habitat? Taonga species like koura, tuna, and watercress are part of a flourishing ecosystem.

DOMAIN: WHANAU ORA – THRIVING FAMILIES

Attribute: Can whanau exercise manaakitanga? The ability for whanau to support the well-being of both themselves and wider whanau, is enhanced or diminished through the availability of taonga species at functions like hui, tangihanga.

Attribute: Can whanau participate effectively in whanaungatanga? The ability to practise taonga tuku iho – intergenerational knowledge transfer, e.g. maramataka, rahui, and wananga etc.

DOMAIN: MAURI ORA – THE ESSENCE OF VITALITY

Attribute: Are the senses awakened at the mahinga kai site? Connecting to the mahinga kai site using all 5 senses.

Attribute: Do tangata tiaki feel connected to the mahinga kai site? Acknowledgement of feeling connected to the mahinga kai site.

Taiao Ora – Flourishing Nature
- Is it safe to eat taonga species from this site?
- Do taonga species have a suitable habitat?

Whanau Ora – Thriving Families
- Can whanau exercise manaakitanga?
- Can whanau participate effectively in whanaungatanga?

Mauri Ora – The Essence of Vitality
- Are the senses awakened at the mahinga kai?
- Do tangata tiaki feel connected to the mahinga kai?

Figure 2: The 3 domains and their attributes

NGA INENGA – MEASURES

Scales were developed to score the attributes for each domain. A description of how the scales were developed and are used is outlined in Annex 1.

For the domains Taiao Ora and Whanau Ora the scales are kao/no = 0 and ae/yes = 1. The scale band rankings (Fig. 3) are:

- aue/low = 0
- pohara/poor = 1
- ahua pai/okay = 2
- pai/good = 3
- pai rawa/excellent = 4.

For Mauri Ora the scales are mauri noho/diminished = 1 to mauri ora/outstanding = 4. The scale band rankings are:

- mauri noho/dormant = 1
- mauri oho/awakened = 2
- mauri piki/engaged = 3
- mauri ora/invigorated = 4.

The scales are consistent with the 4 rating categories used for NOF bands (NPS-FM 2014) and support the NPS-FM and Te Mana O Te Wai values and framework. Individual scores can be given and then aggregated to determine the condition of specific locational values, such as freshwater taonga (e.g. roto, repo, awa, and taonga species and habitats). This kaupapa Maori approach allows any selected freshwater body or culturally significant area (e.g. awa, repo, mahinga kai site) to be assessed and measured within each domain and set of attributes. The approach can then be used to assess and report – over time – on trends (e.g. better or worse). This information could be aggregated up to a freshwater management unit (FMU) or catchment (NPS-FM 2014) to help set standards and limits.

APPLICATION FOR NGATI TAHU-NGATI WHAOA

The description of the measures for the attributes in each domain for Ngati Tahu-Ngati Whaoa is outlined in Figure 4. These measures were aggregated and averaged for the number of assessors/kaimahi.

To improve consistency of assessment, interpretation, and presentation, effective collaboration with iwi/hapu and kaitiaki is essential to determine the tikanga (e.g. principles, correct steps, and process) for all assessments, for setting standards and limits based on this tool for catchments or freshwater management units (FMU), and to achieve desired outcomes.

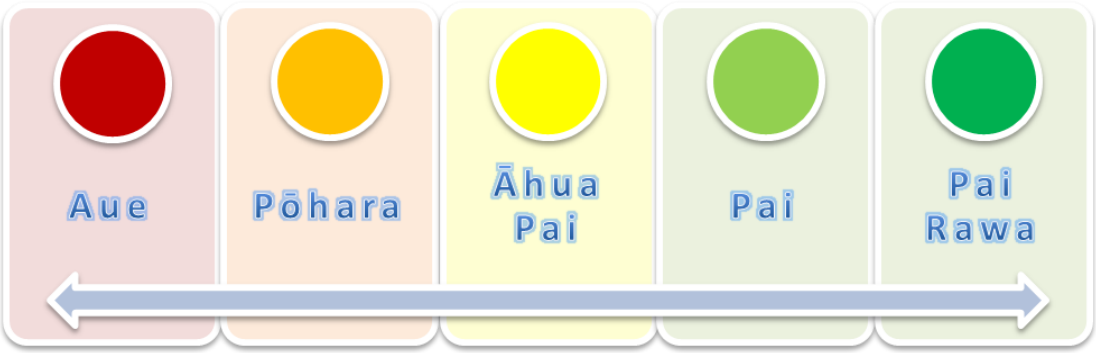

Figure 3: Assessment terms and scale: Aue (system in distress-poor) to Pai Rawa (excellent).

The Likert-type scale data matrix should be augmented with a narrative or korero to supplement details and knowledge to the assessment. An additional summary comment added to the Likert-type scale signifying the importance of a FMU, drawing on narratives reflecting the historical and metaphysical connection that iwi/hapu/kaitiaki Maori may have to that water body (e.g. whakatauki/proverbial sayings) would fulfil this expectation.

APPLYING THE TOOL TO MAHINGA KAI SITES

To date, the mahinga kai value is the most developed of the kaupapa Maori freshwater values and is a compulsory freshwater value within the National Objectives Framework for freshwater NPS-FM 2014. Different tribal terms can be used to describe the sites and locations where indigenous freshwater species have been traditionally used, or where natural resources and taonga can be harvested, such as food, tools, supplies, medicines (Awatere & Harmsworth 2014). Collecting or using customary resources directly from the environment strengthens the relationship with iwi/hapu Maori well-being. Specific mahinga kai sites

- tend to be known to local communities
- form a significant part of Maori relationship with place
- are also frequently referred to in iwi and hapu environmental management plans. These plans are designed to re-establish or support the collection of food for family and community consumption as well as describe sites for the development or transfer of matauranga Maori.

Mahinga kai is therefore one of the primary means of maintaining and enhancing sustainable relationships with freshwater bodies. This assessment approach reinforces the connection with mahinga kai and the revitalisation of matauranga Maori in specific locations, allowing the mauri, health, and condition of these sites to be assessed and reported on.

Figure 5 provides an example of how the tool can be applied and implemented for mahinga kai sites. The assessment can be augmented with narrative korero and traditional knowledge. For the three domains, measures and scoring are given for all attributes, and then aggregated up to provide a final aggregated metric reported within 4 distinct ranges:

- A = 17–21
- B = 12–16
- C = 7–11
- D = 2–6

Taiao Ora – Flourishing Nature

Is it safe to eat taonga species from this site?

AE	1	Koura: Tail is tightly curved
KAO	0	Koura: Tail muscle underneath is porcelain white, or other signs of disease
AE	1	Tuna: Has an even colouring, fins are intact and eyes are bright
KAO	0	Tuna: Looks dull or pale with visible signs of boils, ulcers, parasites, and pale eyes
AE	1	Watercress: No evidence of animal grazing, young shoots
KAO	0	Watercress: Evidence of recent grazing by animals, or in flower, green/purple stalks, located close to riparian margins

Do taonga species have a suitable habitat?

PAI RAWA	4	The habitat capacity very strong and is there minimal impact from invasive pest species and land-use change
PAI	3	The habitat capacity strong and is there some impact from invasive pest species and land-use change
AHUA PAI	2	The habitat capacity limited and is there significant impact from invasive pest species and land-use change
POHARA	1	The habitat capacity severely limited and is there significant impact from invasive pest species and land-use change
AUE	0	The habitat capacity very severely limited and is there significant impact from invasive pest species and land-use change

Whanau Ora – Thriving Families

Can whanau exercise manaakitanga?

PAI RAWA	4	Abundant kai available for hui, such as tangihanga and the whanau
PAI	3	Sufficient kai available for hui, such as tangihanga and the whanau
AHUA PAI	2	Some kai available hui, such as tangihanga and the whanau
POHARA	1	Sparse kai available for hui, such as tangihanga and the whanau
AUE	0	Kai unavailable for hui, such as tangihanga and the whanau

Can whanau participate effectively in whanaungatanga?

PAI RAWA	4	Tikanga (e.g. maramataka (moon/calendar), rahui, wananga etc.) are practised, maintained or shared among whanau, and kaitiaki have full access to the mahinga kai
PAI	3	Most tikanga are practised, maintained or shared among whanau and kaitiaki have some access to the mahinga kai
AHUA PAI	2	Some tikanga practised or shared among whanau, and kaitiaki have limited access to the mahinga kai
POHARA	1	Few tikanga practised or shared among whanau, and kaitiaki have no access to the mahinga kai
AUE	0	Tikanga are not practised or shared among whanau, and kaitiaki have no access to the mahinga kai

Mauri Ora – The Essence of Vitality

Are the senses awakened at the mahinga kai?

MAURI ORA	4	Your gut feeling, hearing, smell, sight, and taste are invigorated
MAURI PIKI	3	Your gut feeling, hearing, smell, sight, and taste are engaged
MAURI OHO	2	Your gut feeling, hearing, smell, sight, and taste are awakened
MAURI NOHO	1	Your gut feeling, hearing, smell, sight, and taste are dormant

Do tangata tiaki feel connected to the mahinga kai?

MAURI ORA	4	The connection between tangata tiaki and the mahinga kai is invigorated
MAURI PIKI	3	The connection between tangata tiaki and the mahinga kai is engaged
MAURI OHO	2	The connection between tangata tiaki and the mahinga kai is awakened
MAURI NOHO	1	The connection between tangata tiaki and the mahinga kai is dormant

Figure 4: Attributes and measures for each domain.

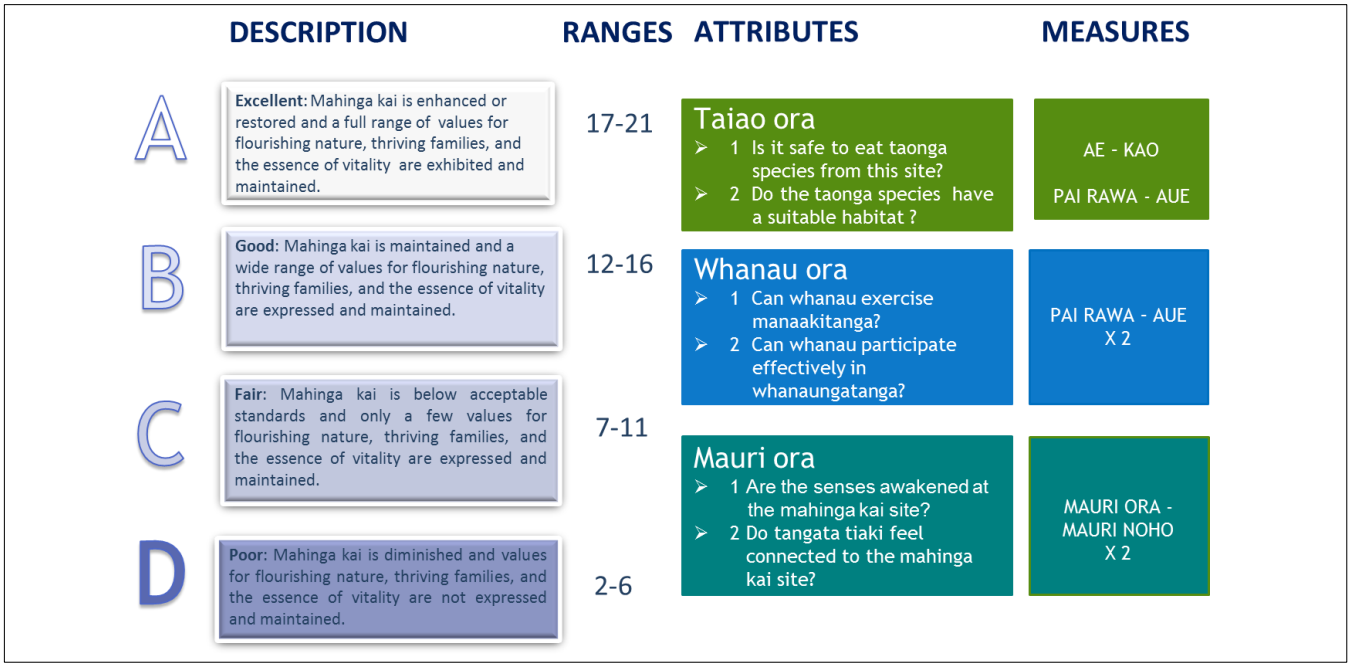

Figure 5: Mahinga kai states

The bands (A, B, C, D) on the left of Figure 5 reflect different levels of attribute states (Taiao Ora, Whanau Ora, and Mauri Ora domains), from excellent to poor. These bands can be used for reporting, and setting standards and limits.

SETTING LIMITIS AND STANDARDS FOR MAHINGA KAI

Figures 6-8 provide examples of how the attributes of mahinga kai can be assessed. The aggregation and Likert scoring of measures into ranges provides an assessment and reporting framework to identify 'bottom lines or limits' for mauri and water quality from a kaupapa Maori perspective. In these examples, four assessors (Kaimahi 1, 2, 3, 4) have recorded assessments for three sites.

All three sites are culturally significant and have been identified as future restoration areas. Both Whakapanake and Torepatutahi Streams are known to Ngati Tahu-Ngati Tahu iwi members as fishing spots that were used in the past and are still currently used. Tuna have been known to be caught from these two sites. Mangakara Stream is a traditional mahinga kai site but is not currently used to gather kai. All three sites are easily accessible; however, Ngati Tahu-Ngati Whaoa whanau require permission from land owners to use the site for mahinga kai.

Four kaimahi, whanau members of Ngati Tahu-Ngati Whaoa who live within the rohe, tested the assessment tool at the three mahinga kai sites. They ranged from pakeke to rangatahi, with a range of experience harvesting kai such as koura, tuna, and watercress.

Each kaimahi evaluated the condition of the site based on the attributes, e.g. Taiao Ora domain – *Is it safe to eat taonga species from this site?*; Whanau Ora domain - *Can whanau exercise manaakitanga?*; and Mauri Ora domain – *Are the senses awakened at the mahinga kai site?*

Each measure is assigned an ordinal ranking, e.g. scales 0–1 for kao/ae, 0–4 for aue – pai rawa, and 1–4 for mauri noho – mauri ora. A cumulative score provides the index score for each site. This score corresponds to a range within a band, e.g. A–D.

WHAKAPANAKE STREAM

Under Taiao Ora domain – *Is it safe to eat taonga species from this site?*; all four assessors have measured as *Ae*. Under Whanau Ora domain – *Can whanau exercise manaakitanga?*; one assessor measured as *Pai*, while the others graded *Ahua Pai*. Under Mauri Ora domain – *Are the senses awakened at the mahinga kai site?;* one assessor measured as *Mauri Piki*, while the others graded as *Mauri Oho*.

The scores given by each assessor were very similar; the grades were then aggregated and averaged, with an overall score of 13. These scores resulted in a B Band – Good: Mahinga kai is maintained and a wide range of values for flourishing nature, thriving families, and the essence of vitality are expressed and maintained.

MANGAKARA STREAM

Under Taiao Ora domain – *Is it safe to eat taonga species from this site?*; all four assessors have measured as *Ae*. Under Whanau Ora domain – *Can whanau exercise manaakitanga?*; one assessor measured as *Pohara*, while the others graded *Ahua Pai*. Under Mauri Ora domain – *Are the senses awakened at the mahinga kai site?*; one assessor measured as *Mauri Piki*, while the others graded as *Mauri Oho*.

The scores given by each assessor were very similar; the grades were then aggregated and averaged, with an overall score of 11. These scores resulted in a C Band – Fair: Mahinga kai is below acceptable standards and only a few values for flourishing nature, thriving families, and the essence of vitality are expressed and maintained.

MAHINGA KAI	Kaimahi 1	Kaimahi 2	Kaimahi 3	Kaimahi 4
Ingoa	Whakapanake	Whakapanake	Whakapanake	Whakapanake
Ra	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Wa	09:40:00 a.m.	09:40:00 a.m.	09:40:00 a.m.	09:40:00 a.m.
Taunga	38°29'26.54"S176°16'21.02"E	38°29'26.54"S176°16'21.02"E	38°29'26.54"S176°16'21.02"E	38°29'26.54"S176°16'21.02"E
TAIAO ORA				
Is it safe to eat taonga species from this site?	AE	AE	AE	AE
Do toanga species have a suitable habitat?	AHUA PAI	AHUA PAI	AHUA PAI	AHUA PAI
WHANAU ORA				
Can whanau exercise manaakitanga?	PAI	AHUA PAI	AHUA PAI	AHUA PAI
Can whanau particpate effectively in whanaungatanga?	PAI	AHUA PAI	AHUA PAI	AHUA PAI
MAURI ORA				
Are the senses awakened at the mahinga kai site?	MAURI PIKI	MAURI OHO	MAURI OHO	MAURI OHO
Do tangata tiaki feel connected to the mahinga kai site?	MAURI OHO	MAURI PIKI	MAURI PIKI	MAURI PIKI
MAHINGA KAI INDEX SCORE	14	12	12	12
AGGREGATE SITE SCORE				**13**

Figure 6: Whakapanake Stream data entry assessment form.

MAHINGA KAI	Kaimahi 1	Kaimahi 2	Kaimahi 3	Kaimahi 4
Ingoa	Mangakara	Mangakara	Mangakara	Mangakara
Ra	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Wa	10.40:00 a.m.	10.40:00 a.m.	10.40:00 a.m.	10.40:00 a.m.
Taunga	38°27'11.18"S, 176°19'33.66"E	38°27'11.18"S, 176°19'33.66"E	38°27'11.18"S, 176°19'33.66"E	38°27'11.18"S, 176°19'33.66"E
TAIAO ORA				
Is it safe to eat taonga species from this site?	AE	AE	AE	AE
Do toanga species have a suitable habitat?	PAI	POHARA	AHUA PAI	AHUA PAI
WHANAU ORA				
Can whanau exercise manaakitanga?	POHARA	AHUA PAI	AHUA PAI	AHUA PAI
Can whanau particpate effectively in whanaungatanga?	AHUA PAI	AHUA PAI	POHARA	AHUA PAI
MAURI ORA				
Are the senses awakened at the mahinga kai site?	MAURI OHO	MAURI OHO	MAURI OHO	MAURI PIKI
Do tangata tiaki feel connected to the mahinga kai site?	MAURI OHO	MAURI OHO	MAURI OHO	MAURI OHO
MAHINGA KAI INDEX SCORE	11	10	10	12
AGGREGATE SITE SCORE				**11**

Figure 7: Mangakara Stream data entry assessment form.

MAHINGA KAI	Kaimahi 1	Kaimahi 2	Kaimahi 3	Kaimahi 4
Ingoa	Torepatutahi	Torepatutahi	Torepatutahi	Torepatutahi
Ra	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Wa	12:40:00 a.m.	12:40:00 a.m.	12:40:00 a.m.	12:40:00 a.m.
Taunga	38°29'11.54"S, 176°20'4.54"E	38°29'11.54"S, 176°20'4.54"E	38°29'11.54"S, 176°20'4.54"E	38°29'11.54"S, 176°20'4.54"E
TAIAO ORA				
Is it safe to eat taonga species from this site?	AE	AE	AE	AE
Do toanga species have a suitable habitat?	PAI	PAI	PAI	PAI
WHANAU ORA				
Can whanau exercise manaakitanga?	AHUA PAI	PAI	PAI	PAI
Can whanau particpate effectively in whanaungatanga?	PAI	PAI	PAI	PAI
MAURI ORA				
Are the senses awakened at the mahinga kai site?	MAURI PIKI	MAURI OHO	MAURI OHO	MAURI OHO
Do tangata tiaki feel connected to the mahinga kai site?	MAURI OHO	MAURI OHO	MAURI OHO	MAURI OHO
MAHINGA KAI INDEX SCORE	14	14	14	14
AGGREGATE SITE SCORE				**14**

Figure 8: Torepatutahi Stream data entry assessment form.

TOREPATUTAHI STREAM

Under Taiao Ora domain – *Is it safe to eat taonga species from this site?*; all four assessors have measured as *Ae*. Under Whanau Ora domain – *Can whanau exercise manaakitanga?*; one assessor measured as *Ahua Pai*, while the others graded *Pai*. Under Mauri Ora domain – *What is the condition of mauri for the mahinga kai?*; one assessor measured as *Mauri Piki*, while the others graded *Mauri Oho*.

The scores given by each assessor were very similar; the grades were then aggregated and averaged, with an overall score of 14. These scores resulted in a B Band – Good: Mahinga kai is maintained and a wide range of values for flourishing nature, thriving families, and the essence of vitality are expressed and maintained.

IMPLEMENTING THE ASSESSMENT TOOL

This tool provides a kaupapa Maori-based approach that has been developed over several years, but more recently has been refined and tested with Ngati Tahu-Ngati Whaoa, which has guided the direction of the tool and ensured tikanga was followed. It has been applied and validated for mahinga kai sites. This work demonstrates the assessment tool and reporting system is useful for providing iwi/hapu Maori perspectives to assess and report the changing state and condition of cultural resources to support current work in the NPS-FM and National Objective Framework (NOF). It can enable assessment and reporting of bands A–D and provide a cultural basis for setting limits and standards for FMUs and catchments (NPS-FM 2014) to protect and manage cultural values (e.g. Te Mana o Te Wai). It also helps build iwi/hapu Maori capability and capacity to use and adapt culturally based assessment tools augmented by matauranga Maori.

A key issue for implementing these types of kaupapa Maori-based tools is to empower iwi/hapu Maori to deliver outputs and recommendations that allow them to achieve their own aspirations and stated outcomes. Therefore, a critical step within freshwater planning and policy processes is to recognise that iwi/hapu are more than just stakeholders and that they have valuable contributions to make within collaborative planning processes to manage natural resources, and these contributions require their own assessment approaches and reporting of values alongside mainstream science.

As part of this empowerment, local government (as the delegated authority from the Crown) will need to enact the principles of the Treaty of Waitangi, including the principle of partnership – the duty to interact in good faith and in the nature of a partnership. A meaningful partnership will provide opportunities for iwi/hapu Maori to participate effectively in all planning processes for freshwater management, from technical advisory groups to governing entities. It is therefore important to have empowered, well-resourced, and well-informed iwi/hapu Maori contributions for those core processes of freshwater management, particularly at a technical level where policies, recommendations, and deliverables are developed and actioned.

REFLECTIONS FROM NGATI TAHU-NGATI WHAOA RUNANGA TRUST

The second stage of the Nga Tohu o Te Taiao project – "Developing a kaupapa Maori assessment tool" which measures the cultural or iwi values that are associated with gathering mahinga kai, and whanau ability to practice kaitiakitanga. Ngati Tahu-Ngati Whaoa desires to take a more proactive approach in understanding the state of mahinga kai within our rohe. We want to actively participate in the decision-making process when setting limits and regulations, to ensure our people can continue to practise the traditions and eat the kai of our Tupuna. Ngati Tahu-Ngati Whaoa in our role as kaitiaki, want to ensure that the mauri of our environment and resources are kept intact. Through respectful management, our environment and mahinga kai will have the ability to sustain itself and support whanau who gather kai to eat and share with others.

Hauora: Taiao Ora - Whanau Ora – Mauri Ora!
Flourishing Nature: Thriving Nature – the Essence of Vitality!

Assisting Manaaki Whenua in developing this assessment tool, based on the core values or pou that are important to Ngati Tahu-Ngati Whaoa, is another step in our journey towards better understanding the state of our environment and how to assist in the process of restoration. Developing a tool that can assist in assessing a mahinga kai site and introducing measures based on iwi values; better enables iwi and others to understand a broader range of issues and how together, we may plan a better approach towards a more complete restoration.

Ngati Tahu-Ngati Whaoa would like to thank Manaaki Whenua for this great opportunity to assist in this project, and of course thanks also to our iwi members who have willingly given up their time to be interviewed and who assisted with the development and testing of the kaupapa Maori assessment tool.

"Mahinga kai is important for the future generations. We want our children and our childrens children to be able to continue to go fishing and eeling in our waters, in our river, within our rohe."
(Mahinga kai interviews 2016)

GLOSSARY OF MAORI WORDS

Ae	Yes, agreed
Ahua pai	Okay
Auē	Expression of distress - low
Awa	River, stream, tributary
Hui	Meeting, gathering
Hapu	Sub-tribe
Inanga	Whitebait
Inenga	Measurement, assess
Iwi	Tribe
Kao	No
Kai	Food
Kaimahi	Reviewer, evaluator, assessor
Kaitiaki	Maori resource manager
Kaupapa Maori	Maori ideology, Maori based
Korero	Language, conversation
Kupu	Word
Mahinga kai	Cultivation, wild food-gathering places
Mahinga tuatahi	First activity, work, first area to cultivate, first fishery
Maori	Indigenous people of Aotearoa
Mara kai	Garden, cultivation

Maramataka	Calendar, daily and seasonal change, planting/fishing to monthly almanac
Mauri	Life force or life essence
Mauri noho	Life essence at a place - dormant
Mauri oho	To maintain or enhance mauri - awakened
Mauri ora	Life essence to support human well-being – invigorated
Mauri piki	Actions that support the maintenance or enhancement of mauri - engaged
Matauranga Maori	Maori knowledge
Pai	Good, maintained
Pai rawa	Excellent, a resource in very good condition
Pakeke	Adults
Pohara	Poor condition, impoverished
Pou	Goal post
Rahui	Restricted, temporary, or regulated access to resources
Rangatahi	Youth
Repo	Wetland, swamp
Reporoa	Long swamp
Rohe	Region
Roto	Lake
Taniwha	Monster, Kaitiaki, water spirit
Tangata tiaki	Person of guardianship
Tangihanga	Weeping, crying, grief, funeral
Taonga species	Precious, treasured resources, cultural based keystone or iconic species
Tikanga	Custom, values, practice
Tipua	Supernatural, strange
Tuna	Freshwater eel
Uaratanga	Goals, objectives
Wairua	Spirit, soul, spiritual dimension
Wananga	Workshop, working meeting
Whakapapa	Ancestry, lineage, connection
Whakatauki	Proverb, saying
Whanau	Family, extended family

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Annex 1: Developing the Kaupapa Maori Assessment Tool

The development of the freshwater assessment and management tool has been informed by Waikato-Tainui values and strategies, Waikato-Tainui researchers, and informed and supported by: interviews and wananga held in 2016 with a Waikato-Tainui Technical Advisory Group (TAG); a methodology based on previous work (Awatere et al. 2017, Auckland Council's Wai Ora Wai Maori programme; Awatere et al. 2015); and previous literature (scoping report – NIWA 2010; Waikato River report card – Williams et al. 2016; the cultural wetlands handbook – Taura et al. 2017; CHI – Tipa & Nelson 2012; and other reports and papers, e.g. Awatere & Harmsworth, 2014; Harmsworth et al. 2016; Hudson et al. 2016). The literature review primarily consisted of documents referring to Maori values, cultural monitoring, and freshwater management. Precedence was given to documents created by iwi/Maori authors with in-depth knowledge of kaupapa Maori approaches. This assessment tool was further adapted by guidance from Ngati Tahu-Ngati Whaoa (NTNW) values and strategies; working with the Runanga Trust members and kaitiaki; informed and supported by interviews with iwi members; and previous literature (Ngati Tahu-Ngati Whaoa Iwi Environmental Management Plan (IEMP) – Runanga Trust 2013; Mahinga kai values – NIWA 2016).

As part of the Nga Tohu o Te Taiao: Sustaining and enhancing mahinga kai project between 2016 and 2017, members from the Runanga Trust and kaitiaki oversaw and guided the development of this tool for application to NTNW mahinga kai sites. This work was an extension from earlier work that NTNW were involved in with NIWA (2016), where they explored processes, tools, and frameworks that supported mahinga kai values within a National Objectives Framework. These values formed the foundation for adapting the kaupapa Maori assessment tool to align with NTNW aspirations.

The logic wheel developed by NTNW researchers aligned with values, actions, and aspirations that were articulated in the NTNW IEMP. The logic wheel aligns with key aspirations and outcomes, which is also embodied in a whakatauki that resonates with NTNW: *Hauora: Taiao Ora – Whanau Ora – Mauri Ora*; *Well-being: Flourishing nature – thriving families – the essence of vitality*. The logic wheel focuses on the health and well-being of mahinga kai, it acknowledges the pou or core values identified by NTNW, and also describes the actions and practicality necessary to protect, enhance and restore them. The whakatauki was the basis for creating a kaupapa Maori assessment tool specific to the values and aspirations of NTNW. Having already gone through this process of articulating their pou or core values, the assessment tool was easily adapted for their purposes.

Taiao Ora encompasses concepts of kaitiakitanga and whanaungatanga:

- Have knowledge and access to natural resources such as taonga species, land, water, and geothermal resources
- Build strong relationships and connectedness between people, place and taonga
- Leadership in restoration projects to ultimately increase ability to gather kai

Whanau Ora encompasses concepts of manaakitanga, matauranga Maori, whanaungatanga and mana whakahaere:

- To tautoko (support each other), whanau (families keeping connected), marae (iwi members remain part of the wider community), and collective iwi identity
- The sharing of inter-generational knowledge transfer – tuku iho
- To gather kai: feed whanau, share with other whanau, provide for kaumatua, and contribute to marae for manuhiri – during times of social functions.
- Maintaining relationships with current and old land owners

Mauri Ora encompasses concepts of kaitiakitanga and manaakitanga:

- Whanau connectedness to a place and space
- Whanau well-being and the identity of the whanau, hapu and iwi
- Spiritual wellbeing and the enhancement of mana

NTNW identified significant taonga species of koura (freshwater crayfish), tuna (freshwater eel), and watercress that allowed them to identify attributes and measures for these specific species. The assessment tool was then tested in the field by four kaitiaki, two pakeke and two rangatahi, each with varied levels of experience – from never harvested from the mahinga kai sites to experienced harvester. The sites chosen for assessment are culturally significant and are known as past and current fishing sites, and identified as future restoration areas. All three sites are easily accessible; however, NTNW whanau require permission from land owners to use the site for mahinga kai.

Testing the assessment tool on-site allowed the kaitiaki to become familiar with it at a practical level, and make further adjustments so that the tool became user-friendly. Korero among the kaitiaki members were varied – based on their knowledge of mahinga kai they provided informative feedback so the tool could be adjusted accordingly.

Developing and applying measures (Nga Inenga)

Measures for each attribute begin with an informed and interpreted qualitative assessment, largely based on subjective field assessment validated by matauranga Maori and science. Assessments may have a degree of difference and vary depending on the number of assessors/kaimahi, their knowledge base, and their subjective technique. Use of a Likert-type scale allows conversion of the subjective assessment into more quantitative relative scores. Using data aggregation divided by the number of kaimahi can help remove bias and difficulty in aggregating qualitative measures by providing an average score to achieve consistency.

Variation in qualitative assessment can be further reduced by kaimahi having in-depth knowledge (e.g. matauranga Maori), training and wananga, professional interpretation and categorisation of qualitative data, and careful conversion into more quantitative data (e.g. ordinal or numeric data), which are then assigned to each attribute. In this Ngati Tahi-Ngati Whaoa case study we used an evaluation approach to score within the three specifically identified domains and attributes, as well as standard descriptors, kupu, and scales.