Implementing Mahinga Kai as a Māori Freshwater Value:

A kete for implementing mahinga kai in the context of the National Policy Statement for Freshwater Management 2020.

Prepared for the Ministry for the Environment

Prepared by Maumahara Consultancy Services Ltd, Awamoana Ltd, Morphum Environmental Ltd, and Tektus Consultants Ltd

March 2022

Mahinga kai connects people with place, tangata with whenua

Prepared by:

Ian Ruru & Simone Shivnan (Maumahara Consultancy Services Ltd), Wolfgang Kanz (Awamoana Ltd), Emily Afoa (Tektus Consultants Ltd), and Caleb Clarke, Stu Farrant, Mark Lowe, and Daniel Nutsford (Morphum Environmental Ltd).

Final review by: Emily Afoa and Caleb Clarke.

Released by: Ian Ruru and Wolfgang Kanz.

The following individuals and organisations are acknowledged for their contributions to the project:

Mahinga kai practitioners and consultants: Barry Matuku, Hurimoana Haami, Marlene Benson, Sam MacDonald, Anne-Maree McKay, Sam Tamarapa, Dr. Shaun Awatere, Dr. Kepa Morgan, Hera Gibson, Tu O'Brien, Mananui Ramsden, Ian Ruru, and Ray Farmer.

Regional Council staff, in particular: Dave Allen (Auckland Council), Mananui Ramsden (Environment Canterbury), Nicola Green, Kataraina O'Brien, Gina Mohi, and Anaru Vercoe (Bay of Plenty Regional Council).

Ministry for Environment-led project team: Alba Jelicich (Project Manager) Dave Allen (Auckland Council), Claire Graeme (MfE), Lyn Harrison (Atahaia Consultancy Ltd), Kataraina O'Brien (Bay of Plenty Regional Council), and Christina Robb (Happen Consulting Ltd).

Technical guidance: Dr. Mahina-a-rangi Baker (Te Kōnae Ltd).

Illustrations: Anakura Kingi-Taumaunu.

Suggested Citation:

Ruru, I., Kanz, W., Afoa, E., Clarke, C., Nutsford, D., Lowe, M., Jelicich, A., & Shivnan, S. (2022). *A kete for implementing mahinga kai within the National Policy Statement for Freshwater Management 2020*. Prepared for the Ministry for the Environment by Maumahara Consultancy Services Ltd and Awamoana Ltd.

Disclaimer

This report was prepared by Maumahara Consultancy Services and Awamoana Ltd under contract to the Ministry for the Environment. It has been designed to assist tangata whenua and councils with the implementation of mahinga kai requirements in the National Policy Statement for Freshwater Management 2020. It is not official guidance, and:

Technical guidance contained in this report may be superseded by official Ministry policy guidance at any time and should be treated with caution.

The information provided has no official status and so does not alter the laws of New Zealand, other official guidelines or requirements.

It does not constitute legal advice, and users should take specific advice from qualified professionals before taking any action as a result of information obtained from this publication.

The Ministry for the Environment does not accept any responsibility or liability whatsoever whether in contract, tort, equity or otherwise for any action taken as a result of reading, or reliance placed on this publication because of having read any part, or all, of the information in this publication or for any error, or inadequacy, deficiency, flaw in or omission from the information provided in this publication. All references to websites, organisations or people not within the Ministry for the Environment are provided for convenience only and should not be taken as endorsement of those websites or information contained in those websites nor of organisations or people referred to.

Executive Summary

Mahinga kai was elevated to a compulsory value under the NPS-FM 2020 and is required to be implemented in the National Objectives Framework (NOF) by 2024. This gives greater recognition to values that Māori hold for freshwater and provides for tangata whenua[1] to meaningfully exercise their freshwater interests and obligations. Mahinga kai is a broad and multi-faceted indicator, which will ensure that a wide variety of quantitative and qualitative Māori measures of health are incorporated into regional freshwater planning. This requires regional councils to work collaboratively with tangata whenua to identify mahinga kai values and to actively involve tangata whenua in decision-making processes.

We firstly introduce the reader to mahinga kai, then go on to place mahinga kai into the context of the NPS-FM 2020. Secondly, guidance for engagement is provided to help tangata whenua and councils work together. Thirdly, existing and new tools that may be applicable within the NPS-FM 2020 context are offered and further insights into the role of mātauranga Māori, data sovereignty, monitoring, and cultural mapping are given. Fourthly, the critical issues of capability, capacity, and resourcing are considered. The final section of the document provides links to particularly relevant and insightful audio-visual, infographic, and fact sheet content.

The work for tangata whenua, regional councils, and communities to implement mahinga kai will be significant. This kete provides tools for both technical and practical aspects for implementing mahinga kai, as well as timely guidance to assist tangata whenua and councils in a successful collaboration.

[1] The specific obligations in the Freshwater National Policy Statement require councils to involve tangata whenua in all stages of the regional freshwater planning process.

In the context of this report the term tangata whenua is assumed to include:

Iwi/hapū/ahi kā (Māori landowners) who exercise mana whakahaere (authority) and other obligations (kaitiakitanga and manaakitanga) to a particular area, water source, space and resource.

Please consult the RMA 1991 for official legal definition of this term.

Contents

List of Tables

List of Figures

1 Introduction

Context within the NPS-FM 2020

One of the most significant changes from the previous NPS-FM 2014 (amended 2017) is the inclusion of mahinga kai as a single compulsory value in the NPS-FM 2020. The two mahinga kai values in the former NPS-FM were combined into one value and elevated from the status of 'other national value' into a single 'compulsory value'. Elevating mahinga kai to a compulsory value promotes Māori measures of freshwater health to the same status as other compulsory biophysical values.

A key driver of this change was that the amended 2017 NPS-FM did not fully enable Māori to participate in, and have their values upheld in freshwater management and freshwater planning processes. This was reinforced by submitters, councils, and advisory groups who advocated for stronger direction for regional councils to engage with tangata whenua and incorporate Māori freshwater values into regional freshwater planning.

The new freshwater planning system now gives greater recognition to values that Māori hold for freshwater. The provisions acknowledge that tangata whenua are the experts for the values and knowledge they hold for their local waterbodies. They also provide an avenue for te ao Māori to be recognised in the freshwater management system and for tangata whenua to meaningfully exercise their obligations to freshwater taonga.

There are specific directions in the NPS-FM 2020 related to how regional councils should work with tangata whenua to implement mahinga kai values through the NOF and are as below.

NPS-FM 2020 text

Requirement for Tangata Whenua involvement under the National Objectives Framework (Part 3.4):

(2) In particular, and without limiting subclause (1), for the purpose of implementing the NOF, every regional council must work collaboratively with, and enable, tangata whenua to:

identify any Māori freshwater values (in addition to mahinga kai) that apply to any FMU or part of an FMU in the region; and

be actively involved (to the extent they wish to be involved) in decision-making processes relating to Māori freshwater values at each subsequent step of the NOF process.

Note: The term 'Māori freshwater values' in the policy / this report encompasses the compulsory value of mahinga kai and any other value identified by tangata whenua for a particular waterbody or Freshwater Management Unit (FMU).

Mahinga kai is a broad and multi-faceted indicator, which means that a wide variety of narrative and numeric Māori measures of health can be incorporated into regional freshwater planning. The NPS-FM 2020 requires regional councils to work collaboratively with and enable tangata whenua to identify mahinga kai values and be actively involved in decision-making processes relating to mahinga kai at each subsequent step of the NOF process, across multiple catchments and within a

short timeframe. This kete provides a range of tools to help address the 2024 deadline, with a particular focus on mahinga kai.

About the mahinga kai kete

The NPS-FM 2020 requires that councils include mahinga kai and other Māori freshwater values and related objectives in regional plans by December 2024. By way of implementing Te Mana o te Wai, every regional council must actively involve tangata whenua and enable the identification of Māori freshwater values and use of knowledge, such as mātauranga Māori, to the management of freshwater and associated decision-making processes. This kete is a resource that may assist with that process. It can be used by tangata whenua and councils alike.

The Ministry set the scope for the following to be achieved through this report:

- Develop a kete (toolkit) of consolidated information and examples around different stages of identifying and protecting mahinga kai, illustrating a range of approaches to facilitate implementing the NPS-FM 2020 compulsory mahinga kai value through the NOF.
- Develop and deliver tools and guidance to support regional councils and tangata whenua to implement the NPS-FM 2020 compulsory mahinga kai value into the NOF process.
- Draw on case studies, examples, and feedback from regional councils and tangata whenua to improve our understanding of current efforts to identify, assess, manage, and report on mahinga kai.
- Improve our understanding of the influence that rohe have on FMUs and their potential effect on the scale at which reporting, and assessment takes place in the NOF.
- Place kaupapa Māori framework assessment tools into the context of the NOF and NPS-FM 2020.
- Place mahinga kai within the broader context of the NOF, and NPS-FM 2020 and Te Mana o te Wai.
- Support regional councils to be able to better support tangata whenua.

While this kete focuses on the NPS-FM 2020 mahinga kai value, it may also be used to identify and implement additional Māori freshwater values.

Mahinga kai is determined locally by tangata whenua.
Whilst there are some requirements, the NPS-FM 2020 does not prescribe a single correct or preferred way to implement mahinga kai. Mahinga kai is specific to iwi, hapū and whānau throughout Aotearoa New Zealand. Accordingly, the kete provides options and guidance and is not intended to be prescriptive.

As experience in implementation and protecting mahinga kai increases there will be opportunities to build on this kete of information. Knowledge building will be pertinent in the regional and freshwater planning context to enable fit for purpose approaches. For that reason, this kete is a resource for tangata whenua and councils to refer to, should they wish to do so.

The NPS-FM 2020 mahinga kai descriptor[2] is appropriately broad and empowers tangata whenua to determine these for themselves. While mahinga kai as a value in the NPS-FM has two descriptors, tangata whenua can identify additional mahinga kai descriptors, and can identify additional Māori freshwater values.

NPS-FM 2020 text

Māori freshwater values under the NPS-FM 2020 mean:

Māori freshwater values means the compulsory value of mahinga kai and any other value (whether or not identified in Appendix 1A or 1B) identified for a particular FMU or part of an FMU through collaboration between tangata whenua and the relevant regional council

Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.

Councils are responsible for producing regional plans and must actively involve, engage, collaborate, and work with **tangata whenua** in freshwater management (including decision-making processes) across all parts of the NOF process.

The *mahinga kai kete* is a compendium of tools, examples, practical guidance, and insights that tangata whenua and councils may choose to assist with:

- identifying the long-term vision and long-term goals to meet target attribute states
- identifying environmental outcomes and objectives for the mahinga kai
- identifying attributes and baselines
- setting target attribute states with timeframes
- understanding how attributes relate to setting limits and/or developing management methods and action plans
- establishing methods for monitoring progress towards achieving target attribute states and environmental outcomes
- undertaking mapping and reporting on mahinga kai
- providing for measures of mātauranga Māori in mahinga kai.

[2] Link to the NPS-FM: National Policy Statement For Freshwater Management 2020 - 2020-go3443 - New Zealand Gazette

Methodology

Several steps were taken to identify the stage of mahinga kai development within councils and elsewhere. The methods followed also facilitated drawing out of examples, successes, gaps, and opportunities – all of which informed the content of the kete.

Beyond the statutory context of the NPS-FM 2020, there have been other avenues where Māori freshwater values have been considered between councils and tangata whenua. These non-statutory examples informed a significant part of this kete.

Hui: Wānanga and hui were held with mahinga kai practitioners, both at the flax-roots level and those working as consultants in related fields.

Surveys: Surveys were sent out to all regional authorities in Aotearoa New Zealand, and meetings were held with council kaimahi.

Analysis of reports and case studies: Case studies / examples of council and other documents relevant to the NOF were reviewed in terms of their application to identification and monitoring of mahinga kai values.

Review of tools: A sub-sample of existing kaupapa Māori assessment tools was analysed in terms of their application to the NOF and mahinga kai.

The details of the survey and tool analysis are in a desktop review report are available at https://www.mahingakai.com/kete.html

Engagement: targeted engagement was undertaken to enable tangata whenua to direct the discussion, on broad topics covered such as:

- Ways to engage with tangata whenua at the flax-roots level in regards to mahinga kai
- Opportunities available and challenges faced when inputting into regulatory / planning processes regarding the NPS-FM 2020 (and attributes / tohu)
- Fundamental issues that need to be considered
- Broader challenges when implementing mahinga kai
- How long-term versus short term aspirations are to be catered for
- How best to manage information and data that may be sensitive and may be requested to be protected by tangata whenua in a region.

This information was key to developing the kete and is reflected in the content.

Report Limitations

Sections of the report are based on targeted research. We, therefore, expect that there is significant understanding to be gained from further research and analysis.

We would like to acknowledge that tangata whenua engagement for this project was targeted, and due the resourcing allocated to the project, could not be large-scale. For any future projects we recommend that a broad-based consultation process is also undertaken, whereby a larger number of iwi and hapū are contacted and given the opportunity to provide more information around key recommendations. It is likely that there are ideas and initiatives that could support others in this journey but are not yet visible to the Ministry or the authors. Additional resource is needed to provide a platform for those willing to express those ideas.

Whilst this report focuses on mahinga kai, it is not intended to suggest that different values, attributes, limits etc., are set independent of each other. Mahinga kai implementation should be weighed appropriately and delivered alongside the other three compulsory values. The report does not cover in any sufficient detail other NPS-FM 2020 compulsory values. As such, there is no detailed advice provided on balancing and integrating the competing values into one holistic freshwater management approach, per FMU or catchment. The expectation is that each regional council will consider this bigger picture when setting limits to achieve target attribute states and outcomes for each value.

Furthermore, the report does not cover setting limits on resources or setting environmental flows in detail. Please check the MfE website for any upcoming guidance on these topic areas.

How to use the kete

The kete is catered towards mahinga kai practitioners, tangata whenua, and councils. It includes a range of intuitive and technical content. In doing so, it reflects the intricate complexity of the topic, and its human / relational element. Councils and tangata whenua are also at varying levels of development of mahinga kai as a compulsory NOF value, thus influencing what elements of the kete they may want to use. Obtaining a common appreciation of the statutory process and the level of effort required for all to undertake the process can be used as a basis to further understand and realise the mutual aspirations of tangata whenua and councils.

The kete is structured as follows:

Table 1. Kete structure

Section	Heading	Description
1	Introduction	Introducing the guidance and outlining the structure of the document
2	Te Mana o te Wai	Description of mahinga kai and its link to Te Mana o te Wai
3	The NOF process	The NOF process as it relates to the mahinga kai value
4	Mahinga kai NOF example	A hypothetical example of implementing mahinga kai
5	Engaging with tangata whenua	Recommendations for effective engagement
6	Tools	Existing and newly developed tools that tangata whenua and councils can use
7	Mātauranga Māori and data sovereignty	The significance of mātauranga Māori and ensuring data sovereignty
8	Monitoring	Practical insights into indigenous and non-indigenous data management and monitoring
9	Cultural mapping	Options for cultural mapping
10	Capability	Gaps, issues, and recommendations for improving capability
11	Capacity and resourcing	Ideas on capacity and resourcing
12	Recommendations for integrating mahinga kai	Suggestions for integration of mahinga kai into council work
13	Audio-visual, infographics, fact sheets	Useful, intuitive resources for tangata whenua and councils
14	Kete elements combined	Bringing all elements of the kete together

Section	Heading	Description
15	References	References and links

The kete is best used as follows:

a. Review the kete in its entirety, becoming familiar with all elements in the kete

b. Take stock of existing council and tangata whenua efforts in addressing freshwater outcomes

c. Identify elements of the kete that are applicable to your stage of development

d. Go through relevant audio-visual, infographic, and fact sheet content

e. Plan your next steps, integrating kete tools, examples, practical guidance, and insights as appropriate

f. Engage with experienced practitioners where necessary

Throughout this kete, look out for the following symbols and colour boxes

This symbol identifies quotes from tangata whenua.

This symbol identifies key resources for further reading.

This symbol indicates 'food for thought' – important considerations

Green text boxes: refer to text directly from the NPS-FM 2020

Blue text boxes: Are not policy and are instead information or interpretation boxes.

Grey boxes are 'food for thought' or quotes from relevant source.

2 Te Mana o te Wai

Introduction

Te Mana o te Wai is a mātauranga Māori approach to water which focuses first on the health and wellbeing of water and water systems, secondly on the health of people, and thirdly on social, economic and cultural wellbeing.

Te Mana o te Wai must be given effect to when managing freshwater and directs how the NPS-FM 2020 is implemented, in accordance with the direction shown in Figure 1.

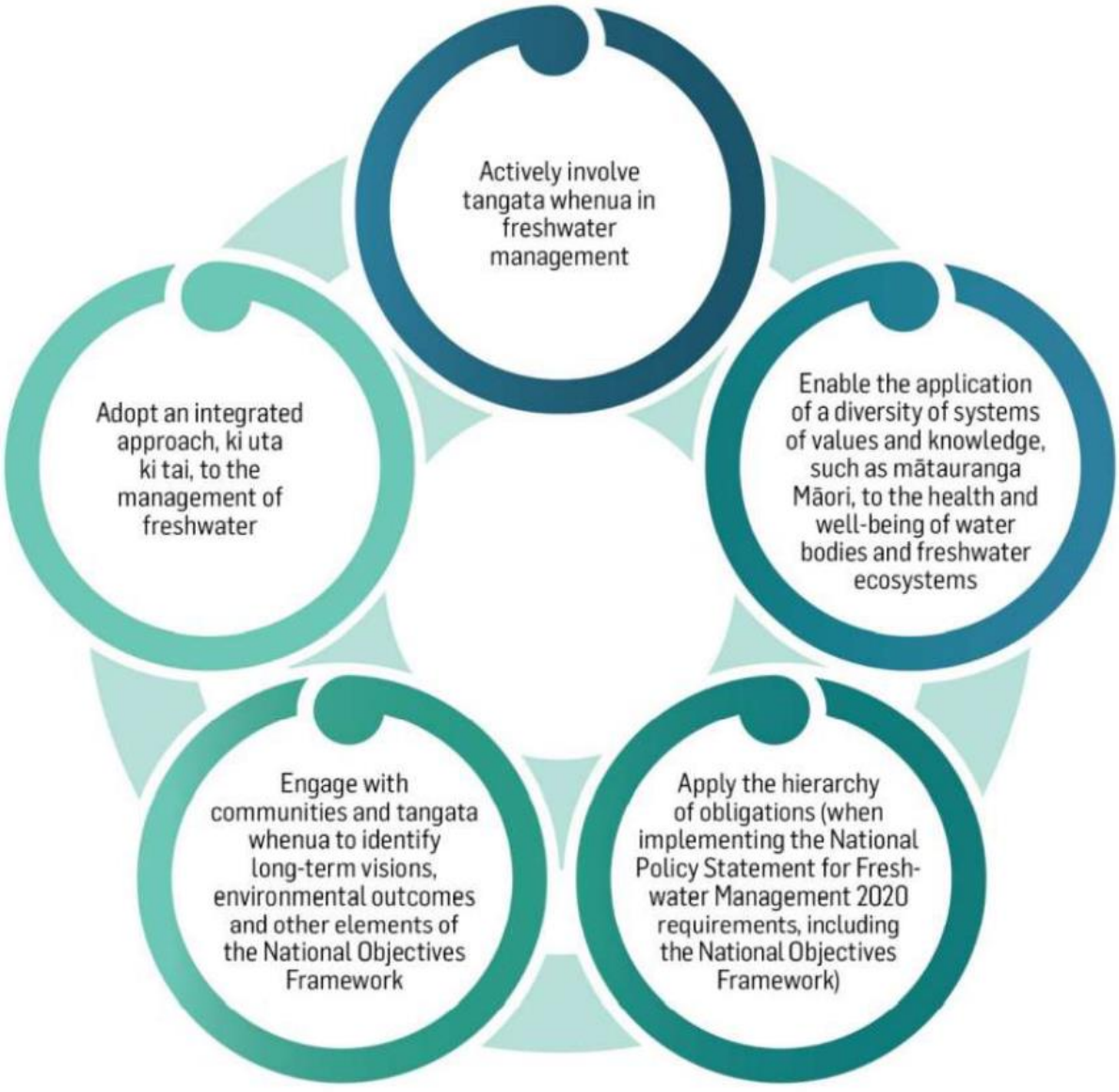


Figure 1. How regional councils must give effect to Te Mana o te Wai

Source: Ministry for the Environment and Ministry for Primary Industries, 2020.

Te Mana o te Wai encompasses six principles:

a. *Mana whakahaere*: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater

b. *Kaitiakitanga*: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations

c. *Manaakitanga*: the process by which tangata whenua show respect, generosity, and care for freshwater and for others

d. *Governance*: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future

e. *Stewardship*: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations

f. *Care and respect*: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

Te Mana o te Wai also imposes a hierarchy of obligations, as follows:

a. first, the health and well-being of water bodies and freshwater ecosystems

b. second, the health needs of people (such as drinking water)

c. third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

Mahinga kai is intrinsically connected to Te Mana o te Wai. The principles of mana whakahaere, kaitiakitanga, and manaakitanga are integral to mahinga kai and underpin tangata whenua relationships and connections with the wai.

> *Through the relationship with ngā atua kaitiaki (spiritual guardians), mana whenua believe they have a duty to their tūpuna (those living and those to come) to take care of and protect ngā taonga*. (Tasman District Council, 2018)

During the policy development process mahinga kai was put forward by partners as a compulsory value because it is comprised of multi-faceted and integrated indicators that address both kai being safe to harvest and eat, and ensuring the mauri of the wai is intact. It is considered a positive step in responding to Te Mana o te Wai.

Key resource:

1). Te Kāhui Wai Māori overview on Te Mana o te Wai and response to Essential Freshwater

Kāhui Wai Māori Report (Kāhui Wai Māori, 2019)

Mahinga kai 101

Mō tātou ā, mō ngā uri ā muri ake nei

For us and our children after us.

Mahinga kai connects people with place, tangata with whenua.
A literal definition of mahinga kai is 'food-gathering place' and includes the work associated within these contexts. Whilst this is the literal translation the concept within te ao Māori is much deeper and broader.

Mahinga kai has its roots in the creation stories and acknowledges the enduring connection between the atua, whenua, the natural resources, and the people. Therein, all things within the natural world are related and informed by tikanga regarding how to participate within these contexts.

As such, mahinga kai is about people, their connections to places including the places where natural resources are obtained, the resources themselves and, the principles that inform how these resources are harvested and managed. Recognition therefore of tangata whenua connections to the natural world and the principles of kaitiakitanga and rangatiratanga are fundamental to working within mahinga kai contexts. Importantly, it is about how whakapapa determines tangata whenua rights to access and exercise rangatiratanga (or 'chieftainship') over resources.

Mahinga kai is inter-generational
Mahinga kai is concerned with sustainability, subsistence, and prosperity, and upholding the tikanga of past generations, for this generation and the generations to follow.

Furthermore, mahinga kai can be considered traditional / indigenous currency with an economic / market value. Trading of resources and taonga, in line with traditional customs and practices (tikanga and kawa), is integral to Māori society and mahinga kai.

Mahinga kai is a holistic and integrated value
While other NPS-FM 2020 compulsory values and attributes link through to conventional freshwater indicators such as water quantity, quality, and life in the water, they do not directly address tangata whenua relationships and connections with freshwater. For example, the compulsory fish and macroinvertebrate NOF attributes are not necessarily indicators of mahinga kai on their own i.e., they don't account for the full picture of access nor the ability to harvest these resources, which may be relevant to mahinga kai. For example, the existing attributes are not easily linked to mahinga kai resources such as fibre, rongoā, and other materials. They also may not address all aspects of physical habitat such as channel morphology, large woody debris, etc., which may be important for mahinga kai. Although periphyton, submerged plants, and deposited fine sediment relate to some aspects of habitat, there are no attributes for physical habitat aspects such as channel morphology, large woody debris, etc.

- Habitat quality is linked to macroinvertebrate, fish, water quality, and water quantity attributes (in combination), and can therefore be used as attributes for mahinga kai should tangata whenua wish to do so.

- There are avenues to link fish and macroinvertebrate NOF attributes (and other compulsory NOF attributes) to the mahinga kai value.
- Mahinga kai can also be supported by the compulsory NOF values of ecosystem health, human contact, and threatened species. These compulsory attributes are biophysical and based on non-indigenous science.

Key findings from literature, surveys, and interviews

Some common themes expressed by tangata whenua included:

- Mahinga kai is more than biodiversity as a standalone value. While biodiversity is important for ecosystem health, and aquatic life (e.g., fish and invertebrates) are indicators of ecosystem health, they are generally not mahinga kai values. As an indicator of ecosystem health, it does however support mahinga kai environmental outcomes (and may for part of the suite of attributes for mahinga kai).
- Mahinga kai requires more than conventional conservation planning.

Tangata whenua view themselves as part of nature, including their customs and practices.

This is why conventional **conservation** approaches, focussed on protecting flora and fauna and keeping people away from natural areas, do not always align with a te ao Māori worldview. These approaches are often considered an artificial separation of humans from nature.

Mahinga kai reflects an entirely different paradigm to preservationist ethics that have underpinned past conservation approaches.

- Mahinga kai may also include surface water, groundwater, and aquifers, connected to surface waters. It includes springs, wetlands, streams, groundwater, aquifers, rivers, estuaries, lagoons, lakes, river mouth, thermal waters, etc.
- Mahinga kai is about 'ki uta, ki tai', within which the whakapapa of the water cycle is key.
- Mahinga kai is more than just fishing or collecting kai.
- Mahinga kai is not only about food – when it comes to resources, but also about recognising the full suite of natural resources - including stones/trees used for fire making, tools, pounamu, hāngī stones, mud used for dyes, rongoā, flaxes for weaving, birds, fish, and other resources associated with water and adjacent areas.
- Mahinga kai is not only about resources. It is about tangata whenua relationships with water, places and the customs and practices associated with these contexts. It is about showing manaakitanga – sharing with the community. It is about mahinga kai as a form of traditional currency used in trading, as a means of connection between iwi, hapū, and whānau.
- Mahinga kai is not only about native species. Over time tangata whenua have had to adapt to the new suite of species in the wai and on the whenua, as native species have gone extinct, are now critically endangered, threatened, and protected, and non-native species occupy the spaces of native species. Freshwater examples include trout and

watercress, which were both introduced into Aotearoa New Zealand. Tangata whenua continue to apply their mahinga kai customs and practices to some introduced species.

Key resources:

(1) Understanding Mahika kai/mahinga kai: Environment Canterbury examples
Protecting Mahinga kai - Mananui Ramsden (Environment Canterbury, 2017)
Mahinga kai/mahika kai (Environment Canterbury, 2018)
- What is Mahinga Kai? (Environment Canterbury, 2018)

(2) Other perspectives on mahinga kai
- Mahinga kai: a beginners guide (Matthew Salmons, 2017)
- Reviving cultural harvests of native birds; Keeping the traditions alive (Rob Tipa, 2005)

What does success look like?

Success will be best measured through tangata whenua observations of wellbeing which are best understood and described through kaupapa Māori-based frameworks. Kaupapa Māori frameworks identify key kaupapa or values that are fundamental to well-being, and success is then measured against whether those kaupapa or values are being enhanced.

The Māori philosophy of health is based on integrated and holistic wellness-centred models. This means that the kaupapa or values that are identified as fundamental to well-being are not just limited to biophysical values, but are broad, and interdependent.

One model for understanding Māori wellbeing or health is the concept of 'te whare tapa whā'[3] – the four cornerstones (or sides) of Māori health, namely taha tinana (physical health), taha wairua (spiritual health), taha whanau (family health), and taha hinengaro (mental health). A common theme across this and other frameworks, is that success encompasses holistic outcomes.

Other Māori health models include, but are not limited to:

- Te Wheke (Māori health models – Te Wheke | Ministry of Health NZ)
- Eight interwoven dimensions of health include Te whānau (the family), Waiora (total wellbeing for the individual and family), Wairuatanga (spirituality), Hinengaro (the mind), Taha tinana (physical wellbeing), Whanaungatanga (extended family), Mauri (life force in people and objects), Mana ake (unique identity of individuals and family), Hā a koro ma, a kui ma (breath of life from forbearers), and Whatumanawa (the open and healthy expression of emotion)
- Te Pae Mahutonga (Māori health models – Te Pae Mahutonga | Ministry of Health NZ)
- Four key tasks of health promotion are described, namely Mauriora (cultural identity), Waiora (physical environment), Toiora (healthy lifestyles), and Te Oranga (participation in society).

How do you measure success in practice with regards to mahinga kai? Examples to include in key performance indicators might include:

[3] Link - Te Whare Tapa Whā (Ministry of Health NZ, 2017)

- Tangata whenua can harvest and collect enough kai and other resources to sustain themselves
- Tangata whenua can access mahinga kai sites via private property
- Water bodies are restored to a state where they can sustain mahinga kai
- Contact with the water heals, it does not make anyone sick
- Collecting, celebrating, and sharing kai is part of family life
- The water feels, looks, smells, sounds, and tastes like it should
- Natural function of water way / body is returned to sustain itself
- Introduced species do not dominate over native mahinga kai species
- Tangata whenua, from kaumātua to mokopuna, harvest kai in the ways of their tīpuna, at the places that are important to them, for whānau and the marae
- Tangata whenua take care of the wai by being an integral part of the decision-making process
- Tangata whenua can observe change, by doing work that improves the mauri of the wai, and by being active and involved kaitiaki for their waters
- Wāhi taonga are known to tangata whenua, protected as needed, accessible, and their mana, mauri, and tapu are restored and in balance
- Tangata whenua can apply rāhui, mātaitai, and other customary management solutions

3 The NOF process

An overview of the NOF

An understanding of the NOF process is important when utilising this kete.

National Objectives Framework

The National Objectives Framework (NOF) requires that every regional council, identifies FMU's in their region and values for each FMU; sets environmental outcomes, target attribute states, and flows and levels, for waterbodies; develops interventions (limits specified in rules, or action plans) to achieve the target attribute states, flows, and levels; monitors waterbodies and freshwater ecosystems; and takes steps if deterioration is detected. This is a simplified definition and more detail on the NOF can be read in the NPS-FM 2020.

As part of the NOF process, mahinga kai is a compulsory value for councils to identify when setting values associated for water bodies in their region. Mahinga kai therefore, must be applied or actioned at each stage of the NOF (Figure 2).

Mahinga kai values are not planned for in isolation. Regional planning, therefore, requires consideration of mahinga kai alongside other compulsory values and any additional values (See the NPS-FM 2020 Appendix 1A and 1B. As shown in Figure 2 below and summarise by Table 1, mahinga kai requires the following steps need to be taken by the regional council, alongside tangata

The following sections explain the steps listed in Figure 2 and Figure 3 alike in more detail; focusing on elements of the NOF and Te Mana o te Wai that have relevance to mahinga kai and tangata whenua. Each step of the NOF process is briefly discussed, and at the end of this section examples are provided.

Key resources:

(1) MfE webinars explaining elements of the NOF process:

- Webinar 1: Translating the NPS-FM and putting it into action (Ministry for the Environment, 2020)
- Webinar 6: NPS - National Objectives Framework (Ministry for the Environment, 2020)
- National Objective Framework webpages on MfE website

Agree on mahinga kai **values** as well as any other Māori freshwater values, that tangata whenua want to provide for in their catchments

Determine **environmental outcomes** for mahinga kai values against associated water bodies

Identify measures of health **(attributes)** to be able to assess mahinga kai values

And set **baseline states** for each attribute

Set **target attribute states** that will contribute to reaching environmental outcomes for mahinga kai

To ensure environmental outcomes for mahinga kai are met: either, develop action plans, **set take limits, and set limits on resource** use

Identify specific **monitoring sites** which reflect the state of mahinga kai values

Monitor mahinga kai values and their attributes, using methods that should include mātauranga Māori, and may also include western-science methods

Set limits and/or develop **action plans** if deteriorating trends are identified, or if there is failure to achieve target attribute states or environmental outcomes for mahinga kai values

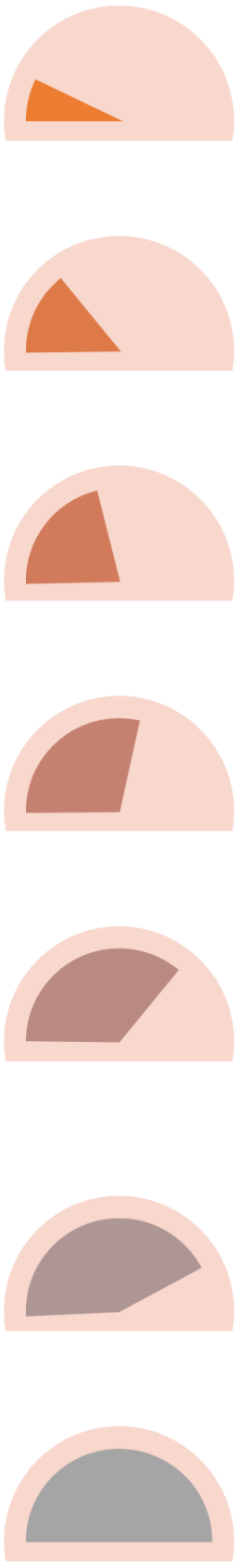


Figure 2. NOF process overview: steps to implement mahinga at each stage of the NOF

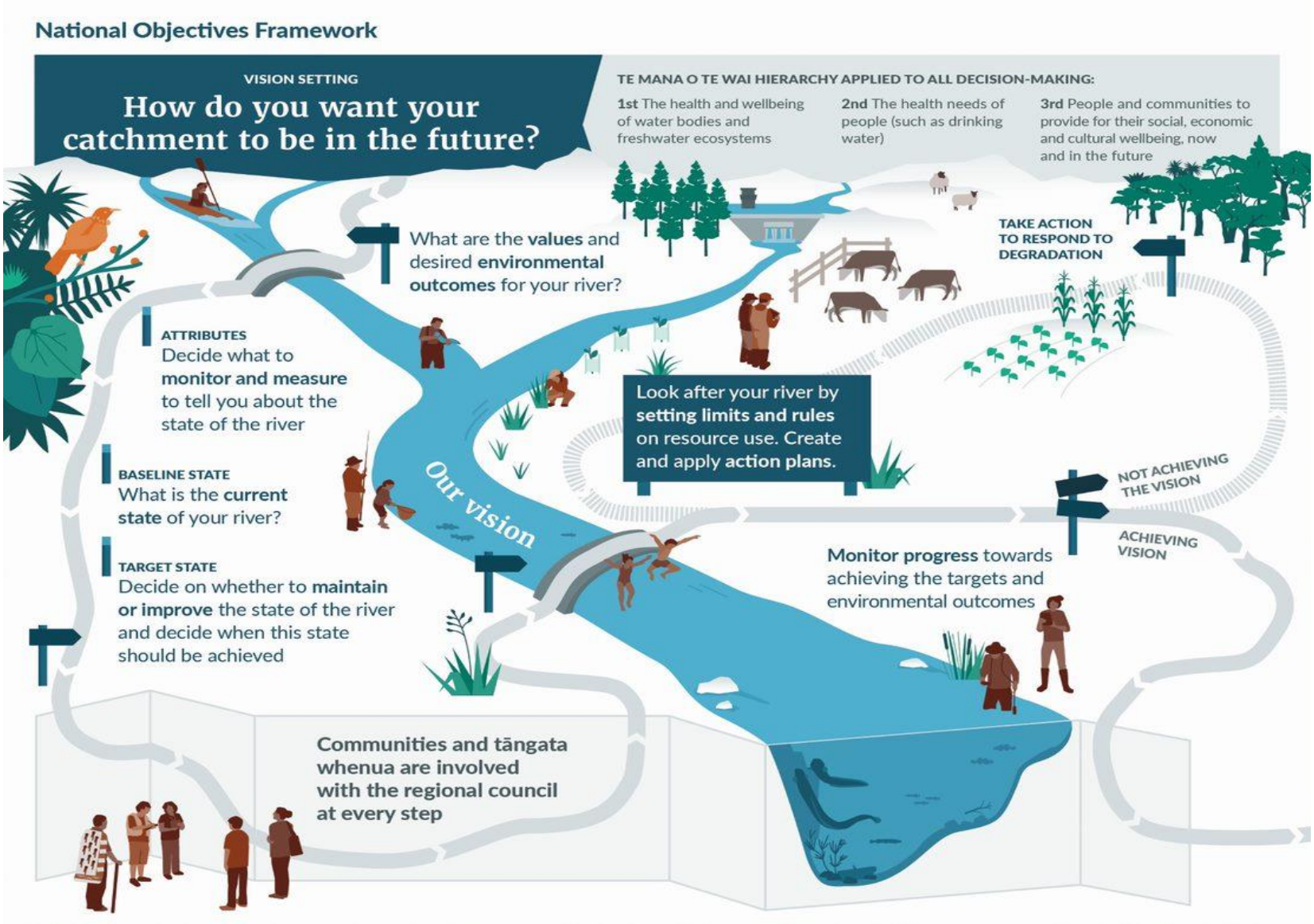


Figure 3 . National Objectives Framework – Managing Freshwater in NZ. (MfE, 2022)

Long-term visions for freshwater objectives

Overview

Although the requirement to develop long-term visions is not technically part of the NOF, long-term visions constitute one of the key changes to the Essential Freshwater package and is a critical part of the NOF. The vision informs all aspects of implementing the NOF and is the starting point but also the end point (see Figure 3 and Figure 4). It is intended to address a lack of long-term planning which has historically occurred, which has to an extent contributed to freshwater decline in New Zealand. The long-term vision is an ambitious but achievable goal that represents the values communities and tangata whenua want to see for their waterbodies in the future. They provide a mechanism for achieving the long-term wishes of communities and tangata whenua that give effect to Te Mana o te wai.

Figure 4. Components in the NOF process, starting with the long-term vision (developed by Kāhu Environmental Ltd, 2020)

To give effect to Te Mana o te Wai regional councils must develop a long-term vision through engagement with communities and tangata whenua. Establishing a long-term vision for a waterbody means capturing the needs and aspirations of the community and tangata whenua in each region. Long-term visions must set goals and identify a time frame that is both ambitious and reasonable (for example 30 years). The long-term vision needs to be based on the history of, and current pressures,

on local waterbodies and catchments (including existing land-use) in order to manage them effectively going forward. Regional councils also need to regularly report on their progress against the long-term vision.

NPS-FM 2020 text:

A long-term vision in the NPS-FM 2020 means a long-term vision developed under clause 3.3 and included as an objective in a regional policy statement

3.3 Long-Term Visions For Freshwater

(1) Every regional council must develop long-term visions for freshwater in its region and include those long-term visions as objectives in its regional policy statement.

(2) Long-term visions:

(a) may be set at FMU, part of an FMU, or catchment level; and
(b) must set goals that are ambitious but reasonable (that is, difficult to achieve but not impossible); and
(c) identify a timeframe to achieve those goals that is both ambitious and reasonable (for example, 30 years after the commencement date).

(3) Every long-term vision must:

(a) be developed through engagement with communities and tangata whenua about their long-term wishes for the water bodies and freshwater ecosystems in the region; and
(b) be informed by an understanding of the history of, and environmental pressures on, the FMU, part of the FMU, or catchment; and
(c) express what communities and tangata whenua want the FMU, part of the FMU, or catchment to be like in the future.

(4) Every regional council must assess whether each FMU, part of an FMU, or catchment (as relevant) can provide for its long-term vision, or whether improvement to the health and well-being of water bodies and freshwater ecosystems is required to achieve the vision.

Any long-term vision set underpins the rest of the National Objectives Framework

- The desired outcomes contained in the long-term vision, will help inform the next steps of the NOF.
- For example, when councils are setting limits on resource use they must have regard to the long-term vision set by the community. Similarly flows and levels should be set in a phased approach to achieve the long-term visions.

Process for developing a long-term vision

- Regional councils will need to meet the engagement requirements set out in the NPS-FM.
- Although the NPS-FM 2020 requires engagement during the long-term vision-setting process, it does not prescribe exactly how and when this must be

- Regional councils may combine the long-term vision engagement with the NOF discussions that they have with communities and tangata whenua, or they may have a separate process, so long as engagement is done sequentially (i.e. don't jump to limits and then retrofit the vision) and in line with NPS-FM 2020 (Sub-part 1; 3.3).

Key findings from surveys and interviews

Tangata whenua provided the following feedback on setting long-term visions:

- Tangata whenua support that long-term visions (and regional policy statement objectives) for freshwater must be ambitious.
- Long-term visions must give effect to Te Mana o te Wai, and therefore the principle of mana whakahaere.
- Current long-term visions that don't include mahinga kai need to be updated.
- Tangata whenua engaged in this project considered that engagement on long-term visions is best through traditional leadership frameworks, based on existing Māori social and culture structures.
- Long-term visions could be over several generations, potentially spanning timeframes longer than local government planning time horizons (e.g., Long Term Plans).
- Whilst long-term visions could be enduring over multiple generations, if change is required to achieve a new state, then the timeframe for this needs to be aspirational and reasonable.
- Mahinga kai values and environmental outcomes need to clearly reflect these aspirational long-term visions, provided by tangata whenua.
- Urgent goals will inform the long-term visions.
- Long-term visions for mahinga kai may best be split into short, medium, and long-term visions.
- Interim goals to meet the overall long-term vision will be important particularly where there is an immediate threat which would prevent a council from achieving a long-term vision i.e. an ecological tipping point is at risk of occurring.
- Iwi/Hapū Management Plans are often good starting points for articulations of long-term visions.

Additional perspectives:

- Mahinga kai values can be integrated with the full suite of freshwater drivers and pressures in the region (e.g., other compulsory values).
- Timeframes will need to be informed by an integrated approach to resource management, where competing interests need to be resolved.
- The above will influence the pace at which Te Mana o Te Wai can be given effect to.
- Long term vision may consider an interim timeframe or consider any urgent goals that must be met in order to reach the long-term vision. This will be particularly relevant if there is an immediate threat (which may result in e.g., and ecological tipping point) which could prevent council from achieving a vision.
- Several regional policy statements for regional council and unitary authorities also set out broader aspirations for looking after the environment and providing for well-being.

Together, a range of these documents will be useful to consider in determining what the long-term vision for freshwater might be.

Key resource:

(1) How to set visions and values: MFE webinar

Webinar 5: NPS-FM - vision setting and value identification (Ministry for the Environment, 2020)

Freshwater Management Units

Overview

The National Objectives Framework is delivered at an FMU, or part of an FMU scale. When setting mahinga kai values however, these may be set either at the scale of an FMU, or part of an FMU or at a catchment level. This flexibility to set values at varying spatial scales provides for managing the localised dimension of mahinga kai values. Management related to mahinga kai value(s), will require identifying monitoring sites within each FMU or part of an FMU, for the purpose of assessing how particular attributes are tracking against target attribute states (see Figure 5). Councils and tangata whenua must also consider whether FMUs established are at a logical scale for setting limits to achieve those target attribute states directly informed by mahinga kai values.

A Freshwater Management Unit is defined in the NPS-FM 2020 as:

Freshwater management unit, or FMU, means all or any part of a water body or water bodies, and their related catchments, that a regional council determines under clause 3.8 is an appropriate unit for freshwater management and accounting purposes; and part of an FMU (referred to as sub-FMU in this document) means any part of an FMU including, but not limited to, a specific site, river reach, water body, or part of a water body

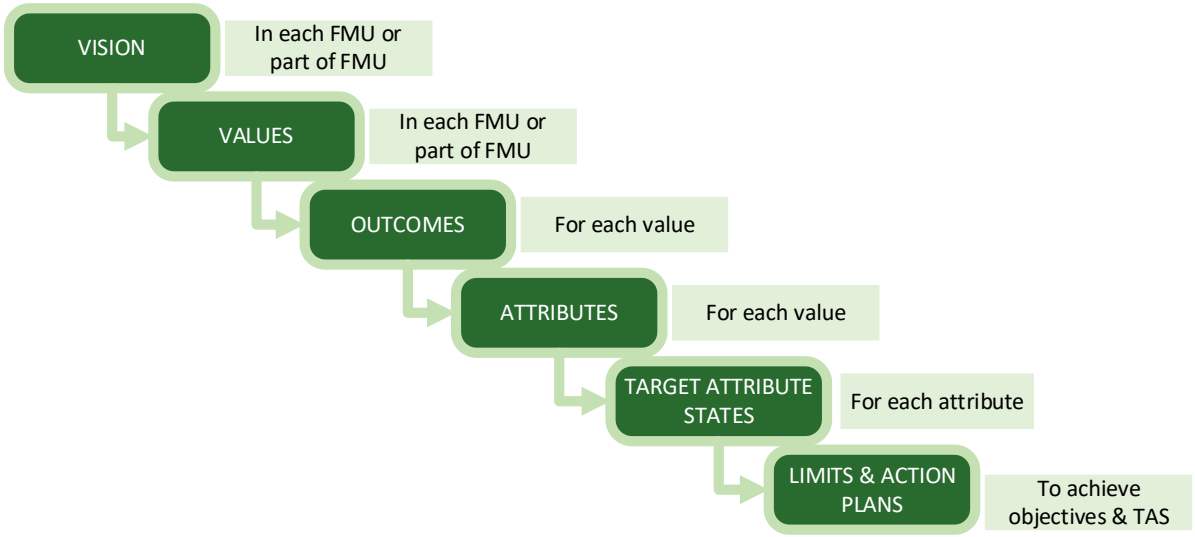


Figure 5. Applying the NOF at an FMU scale (adapted from Bay of Plenty Regional Council, 2021)

Requirements for Freshwater Management Units

Councils must engage with communities and tangata whenua at each stage of the NOF process, including when setting FMUs. However, the NPS-FM 2020 does not mandate a single correct or preferred way to identify FMUs. Each FMU must reflect the unique circumstances of each region, as these circumstances will dictate what freshwater objectives and limits will be set within the FMU. MfE guidance, published in 2016 on identifying FMUs, includes useful primary and secondary considerations for defining FMUs – pg. 16-17[4]. The guidance also provides two sets of questions that may help when setting boundaries for FMUs:

- The first set of questions provides a starting point by considering the hydrological, social, political, and cultural characteristics of the region (including rohe boundaries).
- The second set of questions considers practical issues (physical characteristics and connections) with managing fresh water to give effect to the NPS-FM 2020.

Tangata whenua and councils can consider a range of other processes, tools, and supporting legislation that can address more localised issues. For example:

- Iwi management plans
- Integrated catchment management plans
- Environmental management plans
- Community programmes
- Fisheries management regulations

Recognising the complexity of setting FMUs, the set of questions in Table 2 may provide some practical considerations for those at the decision-making table to help in inform decisions on FMUs.

[4] https://environment.govt.nz/publications/a-guide-to-identifying-freshwater-management-units-under-the-national-policy-statement-for-freshwater-management-2014/

It is also crucial to note that FMU's are not set in isolation of one value and need to take in a range of values and other social and environmental factors.

Table 2. High-level direction for identifying and setting FMUs or sub-FMU units

Question	Towards a catchment/physical approach	Towards a rohe approach	Practical options to cater for rohe
Are catchment boundaries aligned with rohe?	Poorly aligned, many overlaps over catchment boundaries	Highly aligned, few overlaps over catchment boundaries	As a first step overlay rohe and hydrological / physical catchment boundaries – to see what it looks like. Agree on the approach with tangata whenua Align FMUs at the iwi rohe scale as opposed to the hapū rohe scale; reducing the number of rohe(s) Describe hydrological / physical catchment influences between rohe, to enable rohe-scale management decisions in the context of the wider catchment Integration of land and freshwater management from mountains to sea requires specific clarity on the objectives being sought by tangata whenua within a rohe, such that they can be considered in broader integrated catchment management outcomes Provide separate FMUs for special / culturally important waterbodies where warranted (e.g., historical mahinga kai areas specific to an iwi / hapū at the rohe scale) Enable monitoring of Māori freshwater values at a rohe scale, rolled up into larger FMUs; reporting can take into account the rohe scale Enable a longer term process whereby rohe scale differences are captured and provided for in attribute selection / development and attribute states that are specific to the rohe (as informed by that iwi or hapū)
How many different iwi / hapū are there within the hydrological / physical catchment?	Many	Few	
How many affected parties / stakeholders?	Many	Few	
How big are individual rohe?	Small	Large	
To what extent do upstream / downstream / 'out-of-rohe' impacts affect freshwater in the rohe? How the proposed FMU will achieve expectations around an integrated approach, ki uta ki tai, as required by Te Mana o te Wai (see section 3.5 of the NPSFM) Recognises the interconnectedness and interactions between freshwater, land, water bodies, ecosystems and receiving environment	To a large extent Mahinga kai values are affected by catchment-wide processes	To a small extent Mahinga kai values are affected by local processes	
Would FMU monitoring results reflect activities within the rohe or wider catchment (multiple rohe? Does it make sense to undertake freshwater accounting at the rohe scale?	To a small extent	To a large extent	
To what extent are mahinga kai values relevant to non-physical aspects of mahinga kai, where catchment attributes play a lesser role (e.g., rohe-specific Māori cultural customs and practices)	To a small extent	To a large extent	Consider the kind of outcomes that are best addressed at a iwi / hapū rohe scale, and how / to what extent they relate to physical catchment characteristics

To what extent are mahinga kai values relevant to the sub-FMU scale or at scales able to be delivered through actions taken within a sub-FMU	Mahinga kai values relevant to the whole FMU, and can be delivered at that scale	Mahinga kai values relevant to sub-FMUs; a sub-FMU approach may better reflect a rohe or multiple rohe approach, which also considers overlapping rohe boundaries, while still meeting the long-term vision	Consider the kind of outcomes that are best addressed at a range of different scales, and what complementary tools could be employed to move towards the future desired state, and where possible in an integrated way

Considerations when incorporating rohe boundaries from a mahinga kai perspective

FMUs that have considered rohe boundaries may be best suited for implementing mahinga kai values, as these are affected by cultural characteristics as well as hydrological and physical characteristics and connections. The below list are considerations when (setting FMU'S), based on the consultant's research, these considerations do not reflect policy requirements:

- The definition of a FMU is intentionally flexible so councils can determine the spatial scale best suited to managing freshwater in the specific circumstances of their region. This may mean taking into account rohe boundaries. When identifying FMUs, councils must decide on the most relevant and practical approach for their region – there is no 'one size fits all' approach.
- FMUs do not need to be aligned with rohe in order to give effect to Te Mana o te Wai principles, however, the principles of mana whakahaere and kaitiakitanga provide a strong basis for FMUs to be informed by rohe (territory) boundaries and to provide a platform for tangata whenua to exercise their rights and responsibilities.
- Many of the actions to improve mahinga kai, to date, are non-regulatory (and do not relate to the NPS-FM 2020), and these should be considered when delivering the NOF.
- In some contexts, it may be impractical to use rohe boundaries. The establishment of sub-FMUs can be an option for tangata whenua and councils to consider in these scenarios.
- It is important to be mindful of rohe boundaries, but these will not necessarily determine FMUs – there are other approaches to work with rohe boundaries
- For instance, a common approach to FMU setting is using catchments (or combination thereof), in which more tailored regulatory and non-regulatory tools can be applied to mahinga kai within these FMUs. Non-regulatory approaches may be used to provide for rohe specific environmental outcomes that are expected of compulsory values and any other national values sought, against the vision for the region.

Key resources:

(1) How to set FMUs: MFE guidance

- A guide to identifying freshwater management units under the National Policy Statement for Freshwater Management 2014 (Ministry for the Environment, 2015)

(2) Examples of local decisions on FMUs

- Takaka Freshwater and Land Advisory Group Summary of Interim Decisions for Water Quantity and Quality Management in the Takaka Freshwater Management Unit (Lisa McGlinchey et al., 2016)
- Tākaka Freshwater and Land Advisory Group Recommendations Report for freshwater management in the Tākaka Freshwater Management Unit (Lisa McGlinchey & Rochelle Selby-Neal, 2016)

Values

Overview

The NPS-FM 2020 requires regional councils to identify the values that are associated with the water bodies in their regions. The compulsory values listed below, including mahinga kai, are applied to every FMU or parts of an FMU. Regional council may also identify other values. In every case they are required to consider whether the values listed as 'Other values that must be considered' apply in that context- and if they apply, must adopt

NPS-FM 2020 text

3.9 Identifying Values and Setting Environmental Outcomes as Objectives

(1) The compulsory values listed in Appendix 1A apply to every FMU, and the requirements in this subpart relating to values apply to each of the five biophysical components of the value Ecosystem health.
(2) A regional council may identify other values applying to an FMU or part of an FMU and must in every case consider whether the values listed in Appendix 1B apply.

The NPS-FM 2020 includes:

Compulsory values

- **Ecosystem Health**
- **Human Contact**
- **Threatened Species**
- **Mahinga Kai**

Other values that must be considered

- **Natural Form and Character**
- **Drinking Water Supply**
- **Wai Tapu**
- **Transport and Tauranga Waka**
- **Fishing**
- **Hydro-Electric Power Generation**
- **Animal Drinking Water**
- **Irrigation, Cultivation, and Production of Food and Beverages**
- **Commercial and Industrial Use**

Mahinga kai implementation should be weighed appropriately and delivered alongside the other three compulsory values.

It's important to note that mahinga kai values may interact with other compulsory and non-compulsory NOF values, including ecosystem health, human contact, and threatened species – these links should be made particularly when developing attributes and setting limits on resource use, take limits and action plans.

What does 'mahinga kai' mean in the policy?

As above, mahinga kai is one of four compulsory values in the NPS-FM 2020. The NPS-FM 2020 directs regional council to work with tangata whenua to identify **Māori freshwater values*** (including mahinga kai) and then identify measures of freshwater health, also known as attributes (see section 1.6 on Attributes). The **compulsory value** for mahinga kai, includes two aspects that are described in the NPS-FM 2020 in more detail:

- Kai is safe to harvest and eat
- Kei te ora te mauri (the mauri of the place is intact)

Regional councils will work with and enable tangata whenua to decide what these mean for them in their **local contexts**, and to develop the detail.

Noting, that in the context of the NPS-FM 2020 the term '**Māori freshwater values'** is used in Policy 2 and includes the compulsory value for mahinga kai and any other values identified by tangata whenua for a particular freshwater management unit (FMU) or part of an FMU. Agreeing on what values should be considered is determined through collaboration between tangata whenua, communities, and the regional council.

> *"Without water no living thing, plant, fish or animal can survive. Water is a taonga and this taonga value refers to values associated with the water itself, the resources living in the water and the sites, resources and uses of the wider environments that are sustained by the water. Further, water is a holistic resource. As a taonga it is the responsibility of tangata whenua as Tangata Tiaki to ensure that water is available for future generations in as good as, if not better quality. Water has the spiritual qualities of mauri and wairua. The continued well-being of these qualities is dependent on the physical health of the water".* Tipa (2010)

Examples of other Māori freshwater values

Other Māori freshwater values can be considered part of or in addition to mahinga kai, depending on the context and tangata whenua. Some examples include:

- Mauri
- Wai tapu
- Tauranga waka
- Wāhi tapu
- Wai puna
- Nohonga

Key resources:

(2) Examples of local decisions on value setting: regional council reports

- Values and objectives - Environment Southland Water and Land (Environment Southland, 2019)
- Northland Tangata Whenua values (Northland Regional Council, Ministry for Primary Industries and Ministry for the Environment, 2015)
- Reflecting tangata whenua values and interests (Bay of Plenty Regional Council, 2019)

Environmental outcomes and objectives

Overview

Councils must set environmental outcomes for mahinga kai value(s) that apply to each FMU and include them as objectives in regional plans. These explicit outcomes will inform for example, how and where target attribute states are set and what flow regimes and take limits are needed. The NOF process overall, must be delivered to improve the health and wellbeing of degraded waterbodies, and to maintain or improve the health and wellbeing of all other waterbodies.

NPS-FM 2020 text

3.9 Identifying Values and Setting Environmental Outcomes as Objectives

(3) The regional council must identify an environmental outcome for every value that applies to an FMU or part of an FMU.
(4) The regional council must include the environmental outcomes as an objective, or multiple objectives, in its regional plan(s).
(5) The environmental outcomes must:

a. describe the environmental outcome sought for the value in a way that enables an assessment of the effectiveness of the regional policy statement and plans (including limits and methods) and action plans in achieving the environmental outcome; and
b. when achieved, fulfil the relevant long-term visions developed under clause 3.3 and the objective of this National Policy Statement.

Including environmental outcomes as one or multiple objectives in regional plans:

Environmental outcomes must be expressed as plan objectives (refer to NPS-FM 2020, subpart 2: 3.9) and must fulfil the long-term vision set out as an objective in the Regional Policy Statement under clause (refer to NPS-FM 2020, subpart 2, 3.3).

Key findings from surveys and interviews

- While councils must engage with communities and tangata whenua to identify environmental outcomes - mahinga kai environmental outcomes will have the most impact if they are determined primarily by tangata whenua.
- This step in the NOF process also encourages tangata whenua and councils to work together to best articulate how mahinga kai values and associated environmental outcomes are reflected as objectives in regional plans.
- The knowledge held by tangata whenua and councils provides a strong technical platform for developing environmental outcomes that serve both mahinga kai and broader environmental outcomes.
- Environmental outcomes are strengthened through the application of the hierarchy of obligations and six principles in Te Mana o te Wai.

Key resource:

(1) Examples of local decisions on setting objectives for mahinga kai: Ruamāhanga Whaitua

Specific Freshwater Objectives for Fish and Mahinga Kai (Ruamāhanga Whaitua Committee, n.d.)

Attributes and baseline states

Overview

An attribute or tohu is a measurable characteristic (numeric, narrative, or both) of a value. They can be used to assess the extent to which a particular value is upheld or enhanced. The purpose of attributes is that they act as indicators of freshwater health and can therefore be monitored and measured against the success in achieving an environmental outcome for a value (included as objectives in regional plans) that are set for freshwater systems (see Figure 7).

NPS-FM 2020 text

3.10 identifying attributes and their baseline states, or other criteria for assessing achievement of environmental outcomes

(1) For each value that applies to an FMU or part of an FMU, the regional council:

a. must use all the relevant attributes identified in Appendix 2A and 2B for the compulsory values listed (except where specifically provided otherwise); and
b. may identify other attributes for any compulsory value; and
c. must identify, where practicable, attributes for all other applicable values; and
d. if attributes cannot be identified for a value, or if attributes are insufficient to assess a value, must identify alternative criteria to assess whether the environmental outcome of the value is being achieved.

(2) Any attribute identified by a regional council under subclause (1)(b) or (c) must be specific and, where practicable, be able to be assessed in numeric terms.
and sampling error.

The NPS-FM 2020 does not prescribe specific attributes for mahinga kai. Mahinga kai is locality-specific and may differ between respective tangata whenua. Only tangata whenua can identify and lead the development of attributes that represent the specific mahinga kai values in their local catchments.

A baseline state can be described as the current state of the attribute. Mahinga kai does not have any specified attributes in the NPS-FM 2020 and does not therefore do not have any prescribed bottom lines. Through this project, tangata whenua unanimously disagreed with the notion of a bottom line for any attribute including mahinga kai. Bottom lines may be applied if any of the 2A 2B attributes are chosen to represent mahinga kai values, however, the notion of a bottom line for a mahinga kai will generally not be relevant to a mahinga kai as these values tend to be locally specific rather than characterised nationally.

If alternative attributes/ attribute tables are developed the baseline, however, can be considered a bottom line 'of sorts' as it is a state that marks the starting point for improvement – and importantly, lets you assess how much the water body or ecosystem has improved.

Developing attributes for mahinga kai

There are no pre-defined attributes for the value of mahinga kai, this allows a certain degree of flexibility in which attributes are decided for monitoring purposes. Councils, along with tangata whenua, for instance, may choose to determine or develop new attributes.

Values in the NPS-FM 2020 should not be considered independent of each other

When deciding on attributes for mahinga kai there might be common or shared attributes that will account for several other compulsory values (for example, E. Coli might be an attribute in-common between human health and mahinga kai values). Other existing attributes such as 'Total Nitrogen' or any other attributes detailed in the NPS-FM 2020 Appendices 2A -2C may be a useful measure of mahinga kai -if deemed appropriate by Māori, iwi and hapū involved. This should be decided collectively between tangata whenua and communities.

NPS-FM 2020 text

3.10 identifying attributes and their baseline states, or other criteria for assessing achievement of environmental outcomes

(3) Every regional council must identify the baseline state of each attribute, using the best information available at the time.

(4) Attribute states and baseline states may be expressed in a way that accounts for natural variability

***The term baseline state is interpreted in the NPS-FM 2020 as:**

> **baseline state**, in relation to an attribute, means the best state out of the following:
>
> (a) the state on the date it is first identified by a regional council
>
> (b) the state on the date on which a regional council set a freshwater objective for the attribute under the National Policy Statement for Freshwater Management 2014 (as amended in 2017)

The following criteria could be considered to assist with the implementation of attributes:

- Be kept as simple as possible for measuring and reporting purposes
- Specific and, where practicable, be able to be assessed/converted into numeric terms
- Measurable over time, with a robust and repeatable method or approach to monitoring or data collection
- Locally relevant to tangata whenua and where appropriate are specific to certain catchments across the region

- Are appropriately chosen, in that they will be able to achieve environmental outcomes set for the relevant value(s) and the relevant long-term vision
- Understand the links between the attributes and what actions, such as action plans or water take limits (regulatory or non-regulatory) would need to be in place to achieve target attribute states

When developing attributes for mahinga kai, tangata whenua, councils and communities should consider the following:

- **Key success factors for achieving the environmental outcome set for each value;**
    - Success of the attribute depends on the relative ability for it to be measured, whether that be by gathering quantitative or qualitative data via western science or kaupapa Māori monitoring methods.
    - Some attributes will be challenging to monitor over-time. Others may be less useful when determining limits on resources and flow levels. The NOF is a cascade and the attribute and target attribute state chosen will directly inform how regional councils set environmental flows, issue consents, set limits and put in place action plans, therefore the practicality of any attribute chosen is an important factor in successfully meeting outcomes and visions for a catchment or FMU.
    - Thinking ahead to ensure that the target attribute state of an attribute will achieve mahinga kai environmental outcomes.
    - Attributes (or a balance of attributes) should be determined by taking a Te Mana o te Wai hierarchy approach, whereby the priority is to determine those attributes that will lead to rules and limits to provide firstly for the health and well-being of water.
    - This means, understanding what attributes will have the most effect or the most influence on regulatory or non-regulatory actions, particularly in how it may influence resource use/ take limits/ land use change.
    - It may be useful to develop a set of criteria when narrowing down from a list of possible attributes. For example, some iwi have used an influence matrix ' what has the strongest influence', to prioritise a list of competing attributes against a value. This acknowledges that some attributes are more passive than others.
    - Consider scale, and whether there is a need for attributes to be place-based and specific to tangata whenua for that local-context
- **Consider what information is used to derive your attribute and how it can be measured**
    - As mahinga kai is people-centred, attributes can be quantitative, semi-quantitative, or qualitative (narrative).
    - Information sources may vary for mahinga kai - this is collected through people-centred approaches (incl. orally through wānanga, hui, literature searches, etc.) in addition to measurements in the field (and using non-indigenous methods).
    - Te ao Māori framework tools can be used to derive a score within bands, provided there is a documented robust and repeatable method / approach, and comfort with using a scoring, system on the part of tangata whenua.
    - Attributes may be numerically quantified through the use of multi-stage rating scales such as Likert scales.

- Attributes can relate to 'intangible' indicators such as customs and practices, such as rāhui, tikanga, permitting they are related to freshwater and if a robust and repeatable method of quantifying this attribute can be provided – for example practitioners will need to ask themselves whether a baseline state can be quantified.
- Natural variability of a waterbody may need to be accounted for when expressing baseline states and/or TAS. For example, some waterbodies in New Zealand are naturally low/high in dissolved oxygen depending on their location and other environmental characteristics.
- In some cases, there will be no baseline state for mahinga kai attributes (unless previous monitoring at a site, or where other relevant attributes used have a baseline state), in which the current state may be measured against.
- Attributes may be derived using existing relevant attribute tables in Appendix 2A and 2B of the NPS-FM 2020.

- **Attributes development takes a tangata whenua led approach**

  - Tangata whenua are supported to locally develop attributes that represent the specific mahinga kai values in their local catchments. This aspect of the process for implementing the mahinga kai is critical.
  - Tangata whenua decide how to approach developing mahinga kai through the NOF process, including whether to include expert panels, use existing te ao Māori tools, develop their own frameworks, or a combination of approaches.
  - Establishing an expert panel is one tested approach to work through this mahi – and is recommended to include both mātauranga Māori and non-indigenous science experts.

- **Dealing with information deficits**

  - There may be information deficits which make it challenging to develop mahinga kai attributes at the level desired within the timeframes December 2024. If information is insufficient to assess the value, it is required that an alternative criteria is developed to assess whether the outcome for that value is being achieved – and that action plans and limits can be set.
  - If it is not feasible for a given attribute to be measured (through analysing numeric or narrative data) a different attribute may be identified.
  - New information and data - numeric or narrative - may be gathered to inform setting baseline states, and target attribute states. However, if information is perceived to be too cumbersome to obtain (and monitor overtime), as above, either an alternative criteria is develop or the involved parties may reconsider the attribute to ensure that action on the ground is taken.
  - When creating attributes at a smaller spatial scale that are relevant at the hapū or whānau level, this may require the use of the best information available at that point in time, with a commitment to improve information gathering on the attribute.
  - Mahinga kai attributes and target attribute states should be developed as in as complete a way as possible by December 2024, ensuring that it contributes to the determination of limits and actions plan

Target attribute states

Overview

Target attribute states (TAS) can be described as the state of the attribute that needs to be achieved, in order to achieve the associated objectives, outcomes, values and vision. For most values including mahinga kai, regional councils will need to establish one or more attributes, and set TAS.

TAS are about setting desired outcomes for specific environmental, social or cultural indicators of a waterbody. The key purpose of setting TAS is to ensure environmental outcomes are achieved, and as such they are fundamental to what ultimately happens on the ground.

What does the policy say?

Target attribute states must be set for every attribute in the NPS-FM 2020. The attribute tables in Appendix 2 of the NPS-FM apply to four of the five biophysical components of 'ecosystem health' (not flows) and to the value 'human contact', for rivers and lakes.
For any attribute, target attribute states have to be set at or above the baseline state (or current state) (note that there are some exceptions, see the NPS-FM 2020; 3.11).

Attributes for the value mahinga kai will need to be developed in conjunction with tangata whenua [Policy 2].

Any other attributes which are appropriate for supporting the full range of values the community holds for water bodies in their region will need to be identified and monitored [NPS-FM 2020, clause 3.11].

Target attribute states must be expressed by the appropriate unit set out in the relevant table and may be required to be set at the baseline state (usually this is the current) or better [clause 3.10 and definitions 1.4]. Note that the target attribute state for attributes related to the value 'human contact' must be set above the baseline state [NPS-FM 2020, clause 3.11(3)].

In order to achieve target attribute states for the attributes in Appendix 2A, limits on resource use must then be established via rules in a plan [NPS-FM 2020 3.14]. For the attributes in Appendix 2B action plans must be prepared but limits may also be set where possible [NPS-FM 2020 3.12]. Clause 3.14, in the NPS-FM 2020, provides detail on what a limit on resource use may look like and makes it clear that they may be an input or output control or relate to land use. Noting that where the same attribute provides for more than one value, it is the most stringent target attribute state applying to those values that must be achieved (for example the attribute related to clarity may be decided for Mahinga kai as well as for Human health).

Target attribute state considerations

- Mahinga kai attributes and the aligning TAS are developed by tangata whenua based on the specific characteristics of their rohe and their customs and practices.
- Are appropriately chosen, in that they will be able to achieve environmental outcomes set for mahinga kai value(s) and the relevant long-term vision.
- The role of council is to ensure that target attribute states for mahinga kai are achievable while ambitious and viewed in the context of all environmental outcomes.
- Tangata whenua are provided opportunities to participate in the development of other target attribute states and have a direct interest particularly in attributes that are of consequence to mahinga kai (e.g., fish and MCI).

- Monitoring of attributes, ensures that the value is being met but also that limits on resource use are set right and achieving target attributes states (see next section).
- Every target attribute state must specify a timeframe for achieving the target attribute state, which links through to what can practically be done through setting limits, developing action plans, and management methods. Practical considerations are detailed in Table 3. Practical constraints in setting target attribute states and associated timeframesTable 3, Key findings from surveys and interviews

Tangata whenua provided the following feedback

- Mahinga kai target attribute states should be aspirational but achievable and where possible should comprise B and A.
- For any other state there should be continuous improvement, for instance, through the use of action plans or other non-regulatory interventions. This is consistent with a te ao Māori worldview including the importance of whakapapa, inter-generational sharing, mātauranga Māori. Kaitiakitanga and Manaakitanga must also be seen in the context of past and future generations.
- Tangata whenua do not typically plan in Annual Plan or Long Term Plan (LTP) timeframes – their view is multi-generational, planning beyond 100 years – target attribute states should reflect this.
- Maintaining target attribute states other than Band A is not supported.
- 'Interim' target attribute states may be considered, but these should be ambitious and reference through to the overall aim of achieving Band A.

Applying a te ao Māori worldview to attributes

A te ao Māori worldview is holistic in nature, acknowledging the interconnectedness of all living things and is as much concerned with how things are known to what is known or occurring in a particular instance. A scientific reductionist approach is concerned with reducing complex data and phenomena to the sum of its constituent parts in order to explain why things present themselves, in any one instance, or over a period of time.

A key advantage of mātauranga Māori is that it goes back further than statistical sampling in New Zealand-Aotearoa. Mātauranga Māori in-part is based on ongoing observation informed by the maramataka Māori as opposed to taking representative samples at specific points in time through monitoring based on Western science. In this way tangata whenua are able to observe significant changes, seasonally and over longer time periods. Freshwater management carried out by tangata whenua has the benefit of 'management in perpetuity'. Tangata whenua are anchored to their land and apply an inter-generational approach to taking care of their freshwater taonga.

Our role as kaitiaki is to improve the awa for the next generation. We will leave it better than we received it.

There are parallels as both approaches look to consider interrelationships between observations and variables. However, with regards to mahinga kai the application of a Māori worldview within a reductionist framework poses constraints.

Mahinga kai and other Māori freshwater values and attributes of freshwater health, although in-part may be supported by non-indigenous indicators such as the concentration of various chemicals and

environmental flows - are often seen as holistic and being made up of many components, linking the biophysical with cultural and social. This is because mahinga kai as a custom and practice relies on tangata whenua being able to exercise their relationships and connections with the wai, and this is in turn affected by a tapestry of social, cultural, economic, and environmental factors.

Attributes of Māori freshwater values for tangata whenua can therefore be also aggregated and based on human interaction with the wai (comprising multiple linked concepts).

Aggregate attributes

Aggregated attributes can be for example, overall mauri or health scores that are supported by a number of non-indigenous and mātauranga Māori sub-attributes. Aggregated attributes may include a number of linked concepts or attributes in addition to other non-aggregated, supporting tohu such as water chemistry (that may not directly and individually relate to relationships and connections with the wai). Examples of aggregated attributes are shown in Figures 6, 7 and 8. These aggregated attributes may be supported by compulsory attributes for ecosystem health, human contact, and threatened species.

These attributes in Figure 8, 9, 10 weave together resource abundance and health with customs and practices, and practical impediments to undertaking these. However, they are in part reductionist because a specific set of indicators contribute towards achieving environmental outcomes and objectives. Aggregate attributes provide for an integrated approach that better aligns with holistic te ao Māori worldviews – so long as it is a tangata whenua-led process.

Applying aggregate and non-aggregate attributes

The below list provides some insight to help planning for developing mahinga kai attributes:

- Aggregated attributes can be very similar to environmental outcomes and objectives, which are themselves implicitly the result of a combination of multiple underlying factors (holistic).
- While aggregated attributes are described above, this is an option for tangata whenua to consider. They may prefer to use non-aggregated attributes or combinations of the two. For example, tangata whenua could consider compulsory NOF attributes on E.coli as one of the mahinga kai attributes that contribute to achieving environmental outcomes.
- Non-aggregated supporting attributes can be based on both mātauranga Māori and non-indigenous science. For example, water clarity can be measured through turbidity tests or through observation.
- Non-aggregated attributes could also be socio-economic or cultural, as these attributes are often high-order from a systems perspective and therefore reflect the health of a range of lower order biophysical attributes.
- Examples of this would be that knowledge of mahinga kai is transmitted, another would be contact with nature/water/mahinga kai.
- Compulsory NOF attributes provide valuable insights into the state of the environment, which affects how tangata whenua can interact with waterbodies. They can complement indigenous knowledge and vice versa.
- Compared to qualitative / non-biophysical attributes, councils generally have more data on compulsory attributes included in appendices 2A and 2B of NPS-FM 2020. It is

expected that councils will overall be lacking the information and data system to inform the new compulsory attributes in the NPS-FM 2020. Any existing data can be shared with tangata whenua, and may form a starting point for discussions.

- Both non-indigenous science and mātauranga Māori have a role to play and add value to the process of developing mahinga kai attributes.

Key resources:

(1). Information to support setting attributes for mahinga kai

- Indicators for Cultural Resources (Garth Harmsworth, n.d.)
- Māori values – Iwi Perspectives of Freshwater Management (Garth Harmsworth & Shaun Awatere, n.d.)
- Mātauranga Māori knowledge networks (Antoine Coffin, 2018)

Table 3. Practical constraints in setting target attribute states and associated timeframes

Constraint	Description
How does the current state of the catchment affect success?	Catchment characteristics (e.g., land transformation and contaminant runoff) affect how successful we can be. While some issues can be mitigated over time (e.g., reducing contaminants in urban and rural runoff) others are much harder to overcome (e.g., concrete canalised waterways). Examples include: • Riparian margins offer terrestrial mahinga kai elements that may not be affected by water quality • Enabling access to waterbodies, for tangata whenua to connect with the wai (e.g., even if not for collecting kai) • Protecting terrestrial wāhi taonga • Daylighting 'lost' streams • Improving areas where the water is still 'safe' • Affording waterbodies the mana they deserve through plan schedules, and affording them legal protection • Providing the space for customary practices such as rāhui, mātaitai, and taiāpure • Identifying opportunities for land use changes and or restoration during redevelopment of urban/suburban areas
Timeframes and resources	Key issues: • How long does it take for change to take place? • Do we have enough resources to achieve what we want in the timeframes provided? Be honest in quantifying what resources are needed, and how those costs should be met and by whom? • Be realistic in setting short, medium, and long-term targets - this mahi will be ongoing • Can we create action plans in line with these targets? Set realistic targets in action plans.
What can be improved and what can be restored?	While 'restoration' can be the ultimate goal (and may be considered an aspirational goal),. If restoration is the goal, then to what historical baseline?

Constraint	Description
What is extremely difficult or unlikely to ever be improved?	In some cases restoration is likely to be practically impossible, and the potential for improvement is heavily constrained. For example, providing for historical kai gathering at sites that have been transformed into harbours/wharfs. What can be done in these circumstances? While it may be possible to improve some relational attributes (e.g., improving access to waterbodies), what can be done practically 'on-the-ground' in terms of kai may be limited.

Limits and action plans

Overview

Councils will work towards target attribute states for mahinga kai values in three key ways:

a) prepare an action plan for achieving the target attribute state within a specified timeframe
b) identify limits on resource use and include them as rules in its regional plan(s); and
c) impose conditions on resource consents to achieve target attribute states.

Attributes set for the mahinga kai values do not require limit setting (with the caveat if they are attributes specifically from Appendix 2A of the NPS-FM 2020). Action plans or a combination of the above might be the preferred option to achieve goals for mahinga kai.

This report does not cover any further policy detail related to limits, environmental flows and levels and action plans. Please seek advice from MfE, or independent legal advice.

See the NPS-FM 2020 subpart 2, 3.15 -3.17.

When is a good time to plan and discuss limits and action plans?

Councils and tangata whenua may consider taking a holistic approach to discussing and engaging on the NOF. Target attribute states, setting limits, and developing action plans and management methods may all be best discussed together, when deciding on developing mahinga kai attributes.

This is because it results in a comprehensive wānanga on practical constraints to achieving mahinga kai environmental outcomes, which influences the setting of target attribute states and their associated limits, action plans, and management methods. It enables application of a 'lens' that is realistic. This is related to the practical constraints in Table 3.

Limits, action plans, and management methods will determine how long it takes to reach target attribute states. These actions to manage freshwater need to take into account the timeframes that may have previously set for achieving target attribute states.

Key findings from surveys and interviews

Tangata whenua provided the following feedback on limits and action plans.

- The value of action plans, and council efforts in collaborating with tangata whenua on these plans, was acknowledged. A distinction was made however, that freshwater

improvement plans are not necessarily mahinga kai improvement plans, unless the human element is added in and mahinga kai outcomes are catered for.

- Tangata whenua have realistic expectations regarding timeframes for improvement. What is important is establishing a trajectory of improvement, with short, medium, and long term goals - reflected in limits, action plans, and management methods.
- Tangata whenua want to participate in setting limits, and developing action plans and management methods, leading in decision-making on mahinga kai aspects, and undertaking work related to mahinga kai (e.g., monitoring and delivering mahinga kai projects in action plans)
- Action plans should provide for all waterbodies, not just those scheduled as 'significant'. While the NPS-FM 2020 does not refer to significance, councils generally apply a significance lens in their planning processes. The concept of applying significance ratings to waterbodies is not aligned with a te ao Māori worldview, and Te Mana o te Wai. The view is rather that it is a matter of time - while prioritisation may have a role in deciding what to do first, all waterbodies need to be included when setting limits, and developing action plans and management methods.
- There was recognition that everything cannot be solved at once and that there are constraints on how fast change can practically take place. Action plans need to take into account what can be done in the available time. Examples are provided in the text box below.

Examples of actions that may contribute to achieving environmental outcomes:

Short term – catchment management plans being developed; waterbodies named with Māori names; some riparian margins fenced; planting; spawning sites improved and protected; fish passage provided for highest risk culverts or barriers; wai tapū sites identified; important mahinga kai sites identified; land-legal impediments to mahinga kai identified; partial pest control implemented; farm plans being produced; education and awareness; cultural monitoring employed.

Medium term – catchment management plans completed and actions underway, all riparian margins fenced where there is intensive grazing, access to significant mahinga kai sites for day-to-day, land-legal issues being worked on, extensive planting, wetlands created to treat pollution, important cultural sites protected, access provided to important sites, fish passage provided for other culverts or barriers, Māori freshwater values integrated into Regional Plans including rules, in-stream habitat improvements, substantial pest control implemented, farm plans being implemented, education and awareness, cultural monitoring carried out with knowledge sharing empowering future kaitiaki in the rohe.

Long term – catchment management plan actions underway and evolving in response to monitoring results and changes to understanding of best practice; improving navigation up and down rivers; access to mahinga kai sites for day-to-day customs and practices; land-legal issues resolved; all rivers planted, all rivers fenced where there are livestock; in-stream habitat improvements; farm plans implemented, cultural monitoring carried out with younger generations of kaitiaki learning from elders and mahinga kai pūkenga in the rohe; transmission of mahinga kai knowledge to the next generation.

Beyond December 2024, councils may explore other options, such as action plans (see 3.15 of the NPS-FM 2020), that will contribute to achieving environmental outcomes, until there is an overall review of a regional plan – acknowledging that undertaking plan changes are cumbersome and expensive. Preparing action plans are a key mechanism to set out a staged approach to achieve environmental outcomes. They may also be prepared if there is a need to amend or replace an existing action plan. When preparing action plans for this purpose tangata whenua, councils and communities should consider the following:

- Providing for lower levels of Māori social structure (e.g., hapū, whānau) within mahinga kai action plans
- Ensuring reporting takes into account the level of detail (scale) desired by tangata whenua
- Ensuring monitoring is undertaken at the scale appropriate for any given attribute and value.
- Ensuring there is support in place for tangata whenua to continue developing mahinga kai attributes and target attribute states to the desired scale desired.

Key resources:

(1) How to set limits: MfE guidance relevant to the NPS-FM 2014

Draft guide to limits under the National Policy Statement for Freshwater Management 2014 (as amended in 2017) (Ministry for the Environment & Ministry for Primary Industries, 2018)

(2) Example of a framework for setting environmental limits

Environmental Limits - A Proposed Framework for Aotearoa New Zealand (Kiely McFarlane, Jim Sinner, Carlos Campos & Joanne Clapcott, 2020)

4 Mahinga kai NOF example

A hypothetical example of implementing mahinga kai as a compulsory NOF value is provided below.

This table describes the outcome reached from each step of the NOF process.

Table 4. Mahinga kai examples at each stage of the NOF process: part I, long-term vision – attribute setting.

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	**Mahinga kai hypothetical example(s)**
At all stages. At each step of the NOF process, every regional council must: - engage with communities and tangata whenua - actively involve tangata whenua - enable tangata whenua to identify any Māori freshwater values - apply the hierarchy of obligations	Regional councils must engage with tangata whenua to determine where the limits should be set to achieve each of the priorities in the hierarchy, based on the values (identified including mahinga kai values) and the long-term visions identified together.
Long-term vision(s) As objectives in the Regional Policy Statement About communities and tangata whenua long-term wishes for the water bodies and freshwater ecosystems in the region. May be set at FMU, part of an FMU, or catchment level. Must set goals that are ambitious but reasonable (that is, difficult to achieve but not impossible). Identify a timeframe to achieve those goals that is both ambitious and reasonable (for example 30 years). See NPS-FM 2020 3.3 (3) – (4) for further detail on what LTVs require.	**Example A FMU** By 2035 **Long Term Vision #1** Awa and repo have healthy plant and animal communities in the water and on adjacent land, that sustain mahinga kai resources important for tangata whenua. **Long Term Vision #2** Tangata whenua can safely reconnect with their awa and repo, by exercising their traditional mahinga kai customs and practices in the places used by their tīpuna, being kaitiaki of their waters.

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	Mahinga kai hypothetical example(s)
Values The compulsory NOF value of mahinga kai applies in this example. Other Māori freshwater values, may be addressed in this process. The NOF process requires regional councils identify values for each FMU. There are four compulsory freshwater values in the NPS-FM 2020. Regional councils may identify other non-compulsory values. This includes Māori freshwater values, which means the compulsory value of mahinga kai. It also may include any other value identified for a particular FMU or part of an FMU through collaboration between tangata whenua and the relevant regional council. See link for additional information: Freshwater Values • Environment Guide	**Mahinga kai – kai is safe to harvest and eat.** Mahinga kai generally refers to freshwater species that have traditionally been used as food, tools, or other resources. It also refers to the places those species are found and to the act of catching or harvesting them. Mahinga kai provide food for the people of the rohe and these sites give an indication of the overall health of the water. For this value, kai would be safe to harvest and eat. Transfer of knowledge can occur about the preparation, storage and cooking of kai. In FMUs or parts of FMUs that are used for providing mahinga kai, the desired species are plentiful enough for long-term harvest and the range of desired species is present across all life stages. **Mahinga kai – Kei te ora te mauri (the mauri of the place is intact).** In FMUs or parts of FMUs that are valued for providing mahinga kai, customary resources are available for use, customary practices can be exercised to the extent desired, and tikanga and preferred methods are able to be practised. **Environmental outcomes developed for this value address the long-term visions.**

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	Mahinga kai hypothetical example(s)
Environmental outcome(s) As objectives in the Regional Plan Councils must identify at least one environmental outcome per value. Environmental outcomes must be included as an objective, or multiple objectives, in the regional plan. **Environmental outcomes must:** Describe the environmental outcome sought for the value in a way that enables an assessment of the effectiveness of the regional policy statement and plans (including limits and methods) and action plans in achieving the environmental outcome When achieved, fulfil the relevant long-term visions	These translate to long-term visions and the mahinga kai compulsory NOF value into tangible environmental outcomes that can be measured and monitored through attributes. Examples are provided below, which show how environmental outcomes can link through to the long term vision. <u>Environmental Outcome #1 –</u> **Links through to Long Term Vision #1** Tangata whenua can sustainably harvest the mahinga kai plants (such as harakeke) and taonga that are important to them, for whānau and marae events year-round, in the places where they have historically occurred. <u>Environmental Outcome #2 -</u> **Links to Long Term Vision #2** Tangata whenua exercise kaitiakitanga while actively carrying out mahinga kai customs and practices in awa and repo throughout the year, respecting local tikanga and kawa, in the places that are known to have been used by tīpuna.

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	Mahinga kai hypothetical example(s)
Attribute(s)	An attribute is a measurable characteristic (numeric, narrative, or both) that can be used to assess the extent to which a particular value is provided for. For each value that applies to an FMU or part of an FMU, the regional council must identify attributes for any compulsory value. Attributes must be: • Specific and, where practicable, be able to be assessed in numeric terms • Measurable over time, with a robust and repeatable method / approach • Formatted for NOF attribute bands and states, and allow for reporting change Note that attributes link through to environmental outcomes. Multiple attributes are likely to link through to each identified environmental outcome. **Note: Below are some example attributes. These have been selected because they link through to the long term visions and environmental outcomes provided above (to illustrate the NOF 'cascade').**

Compulsory NOF attributes

Compulsory NOF attributes could be used as attributes that support mahinga kai attributes identified by tangata whenua. For example, NPS-FM 2020 compulsory NOF attributes:

- Table 13—Fish (Rivers)
- Table 14 & 15 —Macroinvertebrates
- Table 17—Dissolved Oxygen
- Table 9 & 20 – Escherichia coli
- Table 10 – Cyanobacteria (Planktonic)

Mahinga kai values would also be supported by appropriate environmental flows and levels.

Attributes for the three examples below link through to Environmental Outcome #1 and then through to Long Term Vision #1.

Example Attribute #1a

Value		Mahinga kai
Freshwater body type		Awa and repo in Example A FMU
Attribute description		Abundance of suitably sized eels that can be harvested at mahinga kai sites
Attribute band and description		**Attribute state** Example Awa A[a]
A	Tuna can be harvested sustainably at chosen cultural level of customary fishing	High numbers of tuna of suitable size available for tangata whenua customary fishing[b]. Catch per unit effort[c] > 60 tuna that are between 0.5kg and 2kg[d]
B	Tuna can be harvested sustainably at 50% to 100% cultural levels of customary fishing	Moderate numbers of tuna of suitable size available for tangata whenua customary fishing. Catch per unit effort > 40 tuna that are between 0.5kg and 2kg[d]
C	Tuna can be harvested sustainably at 25% to 50% cultural levels of customary fishing	Low numbers of tuna of suitable size available for tangata whenua customary fishing Catch per unit effort > 20 tuna that are between 0.5kg and 2kg[d]
D	Tuna can be harvested sustainably at <25% cultural levels of customary fishing	Poor numbers of tuna of suitable size available for tangata whenua customary fishing Catch per unit effort < 20 tuna that are between 0.5kg and 2kg[d]
No bottom line applies; target attribute state is Band A Catch per unit effort would be monitored relative to waterbodies.		

[a] Catch per unit effort is relative to the size, location, etc. of waterbodies, and whether it is an awa or repo; this attribute table is therefore relevant to a certain class of waterbodies, and the catch per unit effort has been informed by discussion with tangata whenua on current, past, and desired states.

[b] This might be controlled through customary fishing regulations.

[c] Placing of two mahinga kai hinaki at a mahinga kai site

[d] A 2kg maximum tuna size to provide for mature tuna to migrate, reproduce, and complete their life cycle.

Example Attribute #1b

Value		Mahinga kai
Freshwater body type		Awa and repo in Example A FMU
Attribute description		Wai tapu & noa
Attribute band and description		**Attribute state**
A	Tapu has been restored to noa	There are no sensitive wastes that hinder tangata whenua from undertaking customary mahinga kai practices at any time of the year
B	Tapu in place some of the time	Sensitive wastes prevent[a] tangata whenua from undertaking their customary mahinga kai practices at less than 1 month of the year
C	Tapu in place most of the time	Sensitive wastes prevent tangata whenua from undertaking their customary mahinga kai practices more than 1 month of the year
D	Tapu in place all of the time	Sensitive wastes prevent tangata whenua from undertaking their customary mahinga kai practices at all times of the year
No bottom line applies; target attribute state is Band A. While this is applied across the entire rohe, tapu restrictions on mahinga kai are mapped per waterbody with attribute bands relevant to each waterbody that is subject to tapu restrictions.		

[a] **Rāhui or other customary controls or restrictions used as management tools**

Example Attribute #1c

Value		Mahinga kai
Freshwater body type		Awa and repo in Example A FMU
Attribute description		Access and protection of mahinga kai sites
Attribute band and description		**Attribute state**
A	All sites are accessible and protected	100% of mahinga kai freshwater sites, areas, and routes, can be safely[a] accessed by tangata whenua and are protected[b] against unauthorised use
B	Most sites are accessible and protected	> 75% of mahinga kai freshwater sites, areas, and routes, can be safely accessed by tangata whenua and are protected against unauthorised use
C	Several are accessible and protected	> 50% of mahinga kai freshwater sites, areas, and routes, can be safely accessed by tangata whenua and are protected against unauthorised use
D	Very few sites are accessible and protected	< 50% of mahinga kai freshwater sites, areas, and routes, can be safely accessed by tangata whenua and are protected against unauthorised use
No bottom line applies; target attribute state is Band A. Percentage of sites and land area accessible and protected – mapping analyses.		

[a] Tangata whenua can enter land without health & safety risks from landowners

[b] This achieved through land-legal, planning, and other mechanisms; includes mapping of sites, areas and routes, with mātauranga protected as determined by tangata whenua

For each value that applies to an FMU or part of an FM - if attributes cannot be identified for a value, or if attributes are insufficient to assess a value, then Council must identify alternative criteria to assess whether the environmental outcome of the value is being achieved.

Less quantifiable attributes, such as connection to waterway and intergenerational transfer of knowledge, can be measured by means such as surveys, Likert scales, and other metrics used to assess qualitative information (see Table 5 below for more examples on alternative criteria for attributes).

Table 5. Examples of social attributes and associated monitoring methods, and environmental outcomes set for those attributes (shorted version of Baker, M. 2020).

Value: mahinga kai			
Attributes / Alternate Criteria	**Attribute Unit**	**Monitoring method**	**Environmental outcome**
Intergenerational knowledge transfer	Likert scale	Social survey[5]	An average score of 4 'Te Rea: I am learning and practising this knowledge' across all knowledge types.
Iwi are part of water governance	Likert scale	Annual partnership audit[6]	Achieve 'Tika' score: Decision-making is informed by mana whenua knowledge. Mana whenua have authority over natural resource management to the extent that they are part of its governance, can determine decision-making and are resourced to do so.
Environmental distress	Likert scale	Social survey[7]	An average score of below 3 for severity of distress.
Connection of people to waterways	Likert scale	Social survey[8]	An average score of 3 or above for connection to waterways.

[5] Edmonds, C., & Hawke, R. (2004). Microbiological and metal contamination of watercress in the Wellington region, New Zealand--2000 survey. Australian and New Zealand Journal of Public Health(1), 20: pp. 39-34.

[6] Independent Māori StatutoryBoard. (2018). Te Tiriti o Waitangi Audit Report 2018. Auckland: Independent Māori Statutory Board.

[7] Higginbotham, N., Freeman, S., Connor, L., Albrecht, G., & Agho, K. (2006). Validation of an environmental distress scale. EcoHealth, 3(4), 245-254

[8] Ibid 5
Larson, L. R., Whiting, J. W., & Green, G. T. (2011). Exploring the influence of outdoor recreation participation on pro-environmental behaviour in a demographically diverse population. *Local Environment, 16*(1), 67-86.

Table 6. Mahinga kai examples at each stage of the NOF process: part II, baseline states – monitoring.

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	**Mahinga kai hypothetical example(s)**
Baseline Every regional council must identify the baseline state of each attribute, using the best information available at the time. The baseline state, in relation to an attribute, means the best state out of the following: • The state on the date it is first identified by a regional council • The state on the date on which a regional council set a freshwater objective for the attribute under the National Policy Statement for Freshwater Management 2014 (as amended in 2017) • The state on the date it is first identified by a regional council • The state on 7 September 2017 If no state has previously been recorded, this will likely mean the current state. Tangata whenua identify the band relative to them. The baseline would vary depending on waterbody. Not all waterbodies necessarily have the same baseline, as they vary in the application of mahinga kai.	**Below are provided some examples of what could be considered when determining baselines for the above example attributes.** **Example Attribute #1a - Abundance of suitably sized eels that can be harvested at mahinga kai sites** Baselines could vary based on, for example: • The relative current state of these waterbodies • The extent and type of Impacts on different waterbodies • Natural variation • Types and sizes of waterbodies • Variability in environmental factors such as water depth • Environmental flows **Example Attribute #1b - Wai tapu & noa** Baselines could vary based on, for example: • Issues affecting tapu and noa (e.g., only some waterbodies may have sensitive wastes entering them, resulting in rāhui) • The type of sensitive waste • The unique views of tangata whenua across Aotearoa **Example attribute #1c - Access and protection of mahinga kai sites** Baselines could vary based on, for example: • The relative knowledge of sites • The relative current protections in place • Extent of integration of wāhi tapu into regional plans • Land ownership • Existing relationships with landowners

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	**Mahinga kai hypothetical example(s)**
Target attribute state(s) and timeframe(s) Every regional council must • Set a target attribute state for every attribute identified for a value; and • Identify the site or sites to which the target attribute state applies. Target attribute states for mahinga kai must be set at or above the baseline state of that attribute. Every target attribute state must specify a timeframe for achieving the target attribute state or, if the target attribute state has already been achieved, state that it will be maintained as from a specified date. Timeframes for achieving target attribute states may be of any length or period but, if timeframes are long term, they must include interim target attribute states (set for intervals of not more than 10 years) to be used to assess progress towards achieving the target attribute state in the long term.	Considerations: • Long-term approaches to reach target attribute states mean that interim targets will likely be required. For example, tangata whenua may want to achieve Band C within 5 years, Band B within 10 years, and Band A no later than 20 years from the date of developing the attributes. • Target attribute state timeframes would vary based on practical constraints to achieving outcomes. • Target attributes will be affected by the type and condition of waterbodies - they may therefore vary between waterbodies / sites, based on relative constraints per waterbody. Tangata whenua aspirational inter-generational goals may require timeframes longer than 30 years.

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	Mahinga kai hypothetical example(s)
Limits, management methods, action plans To achieve the target attribute states every regional council: • Must identify limits on resource use that will achieve the target attribute state • May prepare an action plan • May impose conditions on resource consents to achieve target attribute states Limits, management methods, and action plans therefore need to be directly relevant to target attribute states. Limits, management methods, and action plans need to be developed **working back from the target attribute states** – planning and scheduling activities that are likely to achieve anticipated outcomes within stipulated timeframes.	Considerations: Where **interim timeframes** are relevant - limits, management methods, and action plans must be based on achieving anticipated outcomes within stipulated interim timeframes. Action plans would consider the constraints in Table 3 and could include e.g., the short medium, and could include short, medium and long-term actions detailed above. **Below are provided some examples of what could be considered when identifying limits, management methods, and action plans for the above example attributes.**

Example Attribute #1a - Abundance of suitably sized eels that can be harvested at mahinga kai sites

Action plans

- Removal of barriers to upstream and downstream tuna migration – within 2 years (no renewed consents that would create barriers)
- Protecting habitat through stock exclusion – within 10 years
- Projects to improve water quality – 10, 20, and 30-year targets
- Increasing riparian shading through planting
- Projects to increase environmental flows etc.

Management methods

- Implementation of mataitai
- Implementation of seasonal rāhui on fishing, to enable population to recover – within 1 year
- Establishing stakeholder groups – within 2 years
- Farm management plans completed – within 2 years
- Review of regional plan rules – within 10 years

Limits

- Minimum flow. Reducing water takes to provide for environmental / cultural flows for mahinga kai
- Reductions in the application of fertiliser, pesticides, and herbicides (max no. of fertilizer per Ha/ timeframe) may excluded x distance
- Restricting commercial fishing

Example Attribute #1b - Wai tapu & noa

Action plans

- Identification of wastewater discharges – within 12 months
- Stopping discharges of treated / untreated wastewater into awa – within 10 years
- Mapping of rāhui

Management methods

- Wastewater management
- Implementation of rāhui
- Review of consents and regional plan rules
- Compliance and enforcement

Example Attribute #1c - Access and protection of mahinga kai sites

Action plans

- Mapping important cultural sites, areas, and routes – recognised in regional plan schedules
- Produce an engagement plan for working together with private landowners to make available tangata whenua access
- Purchase of land and / or creation of easements
- Application of esplanade reserves
- Incorporation of access requirements into regional plan rules

Management methods

- Important sites have budget allocated for maintenance and improvement
- Access is controlled
- Provision for tangata whenua to undertake monitoring on behalf of councils in culturally important sites, areas, and routes
- Mātauranga is held and managed by tangata whenua

NOF Stage and relevant policy detail to assist in considering the hypothetical examples provided (does not include all policy details)	Mahinga kai hypothetical example(s)
Monitoring Every regional council must establish methods for monitoring progress towards achieving target attributes states and environmental outcomes. The methods must include measures of: • Mātauranga Māori by tangata whenua • The health of indigenous flora and fauna Tangata whenua would undertake their cultural monitoring.	Monitoring should include: - Progress against attribute states - Progress against delivering management methods and action plans - Progress against achieving limits on resource use The scope of monitoring will depend on the attributes as well as applicable limits, management methods, and action plans. **Below are provided some examples of what could be monitored for the above example attributes.** **Example attribute #1a - Abundance of suitably sized eels that can be harvested at mahinga kai sites** Potential monitoring: - Tuna catch per unit effort at each mahinga kai site - Survey of important freshwater mahinga kai sites - Size and abundance of Tuna - Health of Tuna **Example attribute #1b - Wai tapu & noa** Potential monitoring: - Extent of awa and repo affected by sensitive wastes - Application of rāhui - Reductions in sensitive wastes over time - Progress against planned reductions / removals of sensitive waste - Progress against proposed regional plan changes **Example attribute #1c - Access and protection of mahinga kai sites** Potential monitoring: - Percentage of sites and land area accessible - Percentage of sites and land protected through formal (legal) means - Annual visits to important sites, areas, and routes - Compliance and enforcement statistics **Where relevant, cultural monitoring would be supported by monitoring of other NOF values and attributes.**

5 Engaging with tangata whenua

Introduction

This chapter outlines some key considerations when establishing engagement that will achieve:

- A process that is safe for everyone
- A process that is authentic

Key stages of engagement are shown in Figure 6 below.

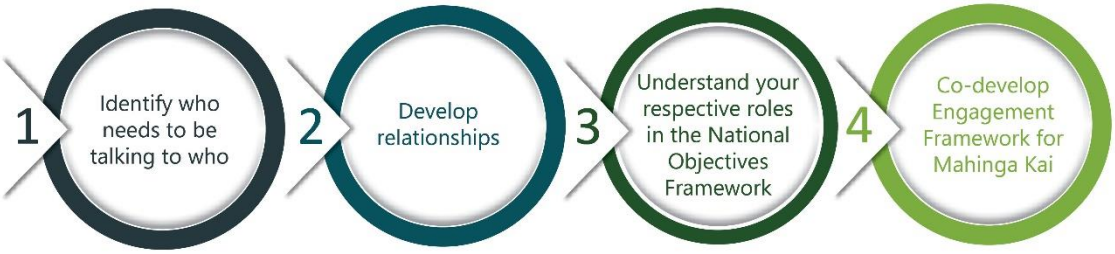


Figure 6. Key steps in engagement

Detail on the steps depicted in Figure 8 is provided at the end of this section, as subsequent sections need to be understood prior to using the step-by-step guide.

High-level estimates of minimum timeframes have been provided, based on engaging with one iwi and it's hapū. Timeframes will however depend on regional characteristics. It is a council's responsibility to enable and support tangata whenua, so that they can create the capacity to engage, albeit through funding or providing other resources to tangata whenua.

The NPS-FM 2020 provides for tangata whenua to be involved in decision-making on the entire NOF. While tangata whenua engagement needs to be across the entire NOF process, this step-by-step guide is only for engaging on mahinga kai values, attributes, target attribute states, monitoring, and action plans. It does not encompass setting long-term visions (for Regional Policy Statements), Regional Plan objectives, and environmental outcomes. However, the concepts could be applied more widely.

Key resources:

1). Engagement guidelines and values

Te Kotahitanga o te Whakahaere Rawa Māori and Council Engagement Under The Resource Management Act 1991 (Te Puni Kōkiri, 2006)

Māori values and perspectives to inform collaborative processes and planning for freshwater management (Mahuru Robb, Garth Harmsworth & Shaun Awatere, 2015)

Guidelines for engagement with Māori (Te Arawhiti, n.d.)

KIWA Group Engagement Report - Wastewater Overflows in Wet Weather Storm Events and Dry Weather (KIWA group, 2020)

Enabling a tangata whenua-led process

Overview

Whilst the ultimate responsibility for including mahinga kai as a compulsory NOF value in regional plans sits with regional councils, the NPS-FM 2020 provides that tangata whenua are enabled to be involved in implementing the NOF and decision-making to the extent they wish. Mahinga kai work should be tangata whenua led, and there is always the potential that tangata whenua are well advanced in the technical work required to implement the compulsory value. Before starting engagement, councils should consider the following kaupapa:

- Mātauranga Māori resides with tangata whenua.
- Māori freshwater values are specific to tangata whenua.
- Mahinga kai values are underpinned by Te Mana o te Wai, which includes the principles of mana whakahaere, kaitiakitanga, and manaakitanga (Figure 7). These are unique to tangata whenua and underpin mahinga kai.
- Kaitiakitanga in this context refers to guardianship and protection of freshwater consistent with a te ao Māori worldview, which includes tangata whenua as part of the ecosystem. It is about a heightened knowledge by which one understands the health of the environment that is home to mahinga kai, and the sustainable customs and practices associated with mahinga kai, including the ability to put in place traditional controls such as rāhui as per cultural health management practices.

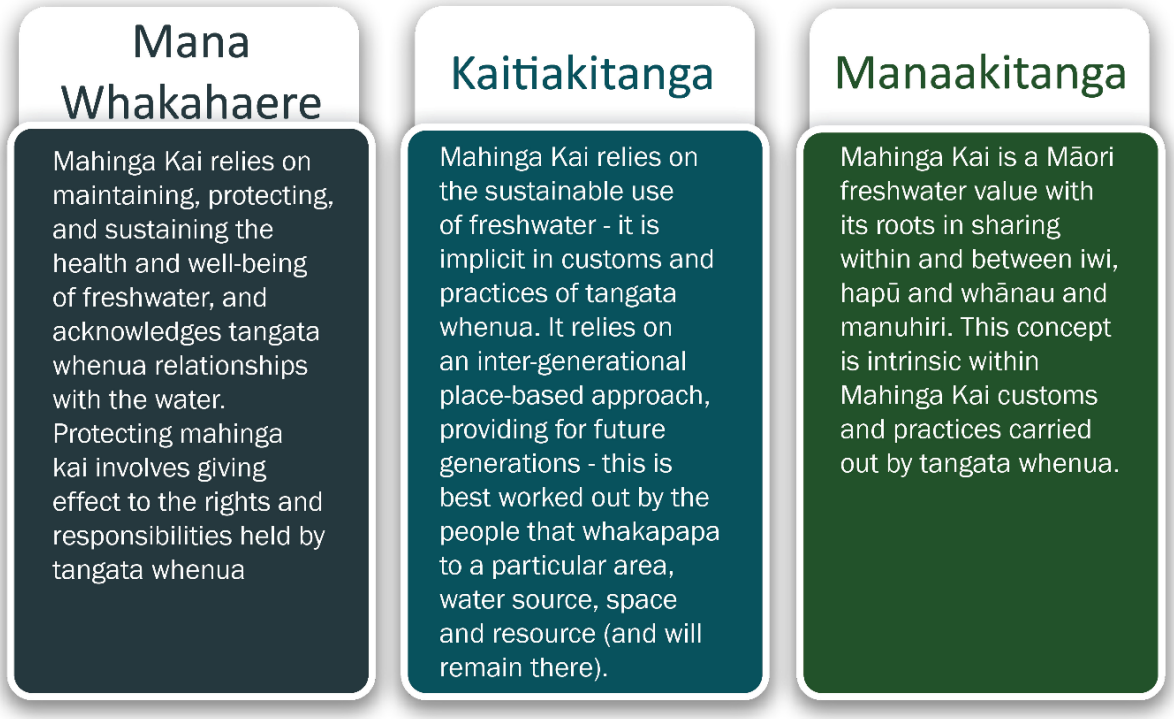


Figure 7. Relationship of mahinga kai to Te Mana o te Wai

NPS-FM 2020 text

3.4 Tangata whenua involvement

(1) Every local authority must actively involve tangata whenua (to the extent they wish to be involved) in freshwater management (including decision-making processes), including in all the following:

(a) identifying the local approach to giving effect to Te Mana o te Wai
(b) making or changing regional policy statements and regional and district plans so far as they relate to freshwater management
(c) implementing the NOF (see subclause (2)).
(d) developing and implementing mātauranga Māori and other monitoring.

(2) In particular, and without limiting subclause (1), for the purpose of implementing the NOF, every regional council must work collaboratively with, and enable, tangata whenua to:

(a) identify any Māori freshwater values (in addition to mahinga kai) that apply to any FMU or part of an FMU in the region; and
(b) be actively involved (to the extent they wish to be involved) in decision-making processes relating to Māori freshwater values at each subsequent step of the NOF process.

(3) Every regional council must work with tangata whenua to investigate the use of mechanisms available under the Act, to involve tangata whenua in freshwater management, such as:

(a) transfers or delegations of power under section 33 of the Act

(b) joint management agreements under section 36B of the Act

(c) mana whakahono a rohe (iwi participation arrangements) under subpart 2 of Part 5 of the Act.

(4) To avoid doubt, nothing in this National Policy Statement permits or requires a local authority to act in a manner that is, or make decisions that are, inconsistent with any relevant iwi participation legislation or any directions or visions under that legislation

Summary of barriers for tangata whenua to engage with councils

While the end-responsibility of tangata whenua engagement on implementation of the NOF and mahinga kai values lies with councils, tangata whenua are free to initiate the engagement and approach councils and lead the kaupapa. This has not always happened for a number of reasons, including (but not limited to):

- Policy, and its implementation, has not been enabling in this regard
- Competing priorities, too little resources
- Tangata whenua have not been provided the resources required to undertake the mahi
- Mātauranga Māori has not been viewed equitably alongside non-indigenous science
- Practical integration into regional plans can be challenging

- Limited access to, and familiarity with council processes for tangata whenua
- Tangata whenua did not feel ready or adequately supported
- Relationships with councils are not good
- Tangata whenua were not made aware of this option.

Practical elements to promote a tangata whenua-led process:

- Promote opportunities for tangata whenua and council staff to collaborate and work together, so that both parties recognise the constraints faced by each other
- Bring council staff or contractors chosen by tangata whenua into tangata whenua organisations for the purpose of working on the NPS-FM 2020 and NOF process
- Bring tangata whenua into council teams working on the NPS-FM and NOF process
- Create opportunities for council staff secondment to tangata whenua entities and vice versa
- Tangata whenua help in the selection process of project managers on mahinga kai projects
- Create space for mātauranga Māori, and valuing input from kaumātua, pūkenga, and whānau
- Keep in mind the important role of kai and koha in these processes
- Allow adequate time for culturally appropriate processes (tikanga)
- Aspects of the NOF process for mahinga kai that tangata whenua may want to lead:
    - Undertaking mahinga kai assessments (e.g., baseline studies)
    - Identifying mahinga kai long term visions, Māori freshwater values, environmental outcomes, attributes, target attribute states, timeframes and priorities.
    - Producing mahinga kai-focused components of action plans
    - Mahinga kai monitoring and data collection
    - Engagement between Māori collectives
- There may be additional Māori freshwater values that are identified through the NOF process that tangata whenua are well-placed to lead
- Tangata whenua must be given the opportunity to speak for themselves, to share their perspectives, and to go through their own decision-making processes with the relevant people.
- Statutory deadlines need to be kept in mind
- Create a platform for tangata whenua to share their understanding of Te Mana o te Wai and mahinga kai with council staff and promote awareness of mātauranga Māori
- To give effect to Te Mana o Te Wai, partnership roles need to be developed at all levels within local government and where appropriate, Central Government
- Create a platform for council to share their NPS-FM 2020 and NOF knowledge with tangata whenua
- Recognise mātauranga Māori as an equally valid knowledge base alongside non-indigenous science methodologies

- Hold wānanga and hui at marae or rūnanga premises, and include noho marae when appropriate
- Conduct wānanga and hui in a manner consistent with local tikanga Māori
- Allocate sufficient funding for authentic engagement
- Provide for te reo Māori. There is a responsibility with councils to make sure council staff have the capacity or receive appropriate education to understand the meaning and contexts of Māori concepts.

Key findings from surveys and interviews

Authentic collaboration and partnership between tangata whenua and councils is crucial. This requires working within both te ao Māori and Crown frameworks. Recognising and respecting each other's unique roles is critical') In the context of freshwater planning processes, tangata whenua and councils highlighted the following:

- The starting point is always developing respectful and trusting relationships. For councils this often means creating opportunities (i.e., allocated funding or allocated FTEs to build relationships with tangata whenua).
- A key precursor to good engagement, is an effort to build council staff knowledge and capacity.
- Tangata whenua highlighted recognition of mana whakahaere and their kaitiakitanga role as critical for success.
- Acknowledging that mahinga kai is a Māori freshwater value.
- Knowledge resides with tangata whenua means that engagement must reflect a Te ao Māori worldview.
- Social, and cultural structures based on local tikanga are critical to engage with Māori.

Key resource:

1). Waiora Aotearoa (Water New Zealand) has produced useful water-related resources accessible through the following links.

Water New Zealand (waternz.org.nz) 2021

Water New Zealand (waternz.org.nz) 2020

Water New Zealand (waternz.org.nz) 2019

Water New Zealand (waternz.org.nz) 2018

Evaluate the risks

High-level disputes / conflict (e.g. unresolved treaty issues, rights and interests, and land ownership) can be obstacles to progressing work on the mahinga kai NOF value (which may be considered a lower priority). This can only best resolved with discussions at the leadership level.

Councils will have to cater for mahinga kai (as a compulsory Māori freshwater value in the NOF) by December 2024, and it will be in everyone's interest to also progress this work. Additional resourcing can be a lever that enables this mahi to be undertaken.

Rethinking the starting point

Councils should approach tangata whenua prior to hui to determine what information is required for the kaupapa. Similarly, tangata whenua should consider what information can be prepared for initial discussions with councils.

The first step is creating an authentic platform for engagement. For tangata whenua this requires giving effect to mana whakahaere, and providing for kaitiakitanga, manaakitanga, kotahitanga, and whakawhanaungatanga.

Practical advice for council staff wanting to engage with tangata whenua:

- Enable a tangata whenua-led process (as described in Section 0)
- Council and tangata whenua need to have clear partnership arrangements (such as Memorandums of Understanding) - if that isn't in place as a starting point, that needs to be the focus
- Tangata whenua and council senior leadership need to agree on a path of contact with tangata whenua to avoid overwhelming individuals
- Where appropriate, approach tangata whenua through existing contacts that councils have with iwi and hapū
- Ensure that you are clear on any established protocols for engagement with tangata whenua, including the correct point of contact and how they prefer to be contacted
- Gain agreement-in-principle where still required from tangata whenua leadership, for council engagement on the Regional Plan and National Objectives Framework, including mahinga kai – obtain this through discussions at the management level
- Be clear at the outset on the broader scope of the work required - for some Councils this will be on the whole plan, not just the NOF, and not even just the NPSFM components
- Make sure all are clear on the kaupapa, and NPS-FM 2020 and NOF 'jargon' is not overwhelming
- Explain available funding for this component of the NOF
- Expect a lengthy process
- Recognise that groups will have other priorities / kaupapa
- Several hui and wānanga will be needed

- Capability and capacity constraints will affect timing
- Make sure mana is respected e.g., if tangata whenua leadership is present, so should council's
- Meet at a venue chosen by tangata whenua
- Use the first hui to introduce yourself and start getting to know each other; the importance of processes such as whakawhanaungatanga cannot be overemphasised
- Agree on next steps, including information sharing (catering for data sovereignty)
- Co-develop and agree on an engagement plan for mahinga kai

Thereafter, you can start getting into the technical subject matter.

Who needs to be talking to who?

Overview

The following should be considered at all stages of NOF engagement:

- Engage with all tangata whenua in an FMU.
- Tangata whenua and councils need to have a complete picture of all partners and stakeholders. The right people need to be talking to each other.
- Tangata whenua need to be engaged at every level of organisation, from on-the-ground staff to governance.
- All tangata whenua groups need to be fairly and similarly included in Council engagement processes, regardless of their resourcing, capacity and capability, current involvement in council processes, and existing relationships with council kaimahi.
- Mātāwaka may also need to be engaged, but this may be done at a stakeholder level rather than in the capacity of mana whenua.

Tangata whenua

Mahinga kai is about the unique and special relationships, connections, and histories that tangata whenua have with their water - physically, spiritually, and culturally.

Councils need to provide opportunities and processes for tangata whenua, to ensure that mahinga kai as a Māori freshwater value reflects their rangatiratanga and kaitiakitanga roles, and is placed-based and specific to them.

Where there are multiple or overlapping interests within catchments and/or FMUs, the principle of mana whakahaere requires that tangata whenua are ultimately responsible for determining via tikanga-based processes how they will engage with council and address multiple interests. It is important that Councils do not assume a role of determining these arrangements.

The principle of mana whakahaere requires that tangata whenua are enabled to follow their own internal processes to identify key parties and individuals and how they will engage with council in this process.

Engaging with tangata whenua will require an approach and resourcing that provides for engagement from:

- All rohe in an FMU

- Tangata whenua rangatira and appointed representatives
- Flax-roots mahinga kai practitioners – e.g., kaumātua, kaitiaki and pūkenga undertaking mahinga kai in their rohe, with practical hands-on experience
- Tangata whenua as a collective, from kaumātua to tamariki/mokopuna
- Mātauranga Māori practitioners – kaimahi working within the regulatory / academic space; experts with knowledge / experience in mahinga kai as a Māori freshwater value and the NPS-FM 2020
- Tangata whenua with existing relationships in council
- Tangata whenua organisations that have a mandate to engage with councils on this kaupapa.

The above will allow for mahinga kai to be assessed at higher levels of granularity to cater for the whānau and ahi kā level, making sure outcomes are authentic and reflect what happens 'on-the-ground'.

Councils

Include the right mix of council kaimahi, and specifically cater for all of the below:

- Council senior leadership.
- Kaimahi working within te ao Māori spaces, in the freshwater management space and Māori engagement / responsiveness.
- Kaimahi who can speak te reo Māori.
- Kaimahi with tikanga Māori knowledge etc. Who have a role to assist in upskilling their Council colleagues, so that this responsibility doesn't fall to tangata whenua, as often happens.
- The above council staff also play an important role in ensuring place-based tikanga and kawa is observed, safeguarding both council staff and tangata whenua.
- If any kaimahi are specifically working on mahinga kai, Māori freshwater values, or closely related aspects – these people are critical.
- Other key staff working on the implementation of the NPS-FM 2020, having been involved in identifying values, attributes, etc.
- People with existing relationships with the relevant representatives from tangata whenua.

The level of detail and 'currency' of information must fit the audience (for example, mātauranga Māori and te ao Māori versus non-indigenous, high-level versus technical, social versus scientific, etc.).

Understand the NPS-FM and your roles

Critical to success and a prerequisite for authentic engagement, we recommend ensuring all engaged parties have a common understanding of the NPS-FM and the NOF.

This includes:

- Understanding why the NOF steps are important for achieving outcomes
- How to give effect to the Te Mana o te Wai hierarchy and principles

- Appreciating respective roles practically and legally – the NPS-FM 2020 provides for tangata whenua and councils
- Understanding what is beyond the scope of what can be done in regional plans (e.g., land-legal issues, and separate legislation on e.g., commercial fishing and conservation areas)

Upfront training, education, and raising awareness may be required.

Working through the Te Mana o te Wai hierarchy and principles is a great platform for understanding each other's roles, aspirations, and how to work towards partnership.

Engagement between iwi, hapū, marae, ahi kā, and whānau

It can be a challenge balancing interests and objectives across different tangata whenua groups. For this research, tangata whenua unanimously agreed that engagement between separate tangata whenua entities should be managed by tangata whenua, and council should avoid, where possible mediating between different entities.

Tangata whenua can then plan for engagement between iwi, hapū, ahi kā, marae, and whānau - according to their local tikanga. They may choose to form technical / advisory working groups or expert panels.

Council may play an administrative and supporting role (e.g., making a venue available for hui), but the extent of council involvement depends on tangata whenua.

Tangata whenua also considered that commercial interests should weighed appropriately so they do not negatively affect the health and wellbeing of the water. This aligns with the hierarchy of obligations in Te Mana o Te Wai.

Developing engagement plans

Co-development of engagement plans by tangata whenua and councils is seen as a practical means of all 'getting on the same page'.

This could include:

- Timing and sequencing of components
- Discovering what tangata whenua have already done in terms of mahinga kai or te ao Māori assessments
- Decisions on which aspects are led by tangata whenua and which are led by councils
- Co-development of communications material
- Establishing an information framework that includes indigenous knowledge sources (such as pūrākau, whakataukī, waiata and other supporting oral narratives)
- Setting up data sharing platforms, ensuring mātauranga Māori is protected and safeguarded with defined expectations for where and how it is used or shared (for example with reference to knowledge sources including pūrākau, etc.)
- Agreeing on communication platforms appropriate for communicating effectively with tangata whenua
- Allocation for face-to-face pursuits, including field trips

- Ensuring that wānanga and hui will be conducted in a manner consistent with tikanga Māori
- Planning for wānanga and hui, to be held within both council and tangata whenua premises
- Planning for technical work, acknowledging the significant and integral role of mātauranga Māori and that mātauranga Māori sits on an equal platform to non-indigenous science
- Establish working groups, with agreed terms of reference
- Work out resourcing and appropriate funding collaboratively.

Step-by-step engagement guide

Flow charts for step-by step process

While the information has been displayed as intuitively as possible, it is recommended that suitably qualified engagement practitioners, particularly with experience in tangata whenua engagement, provide guidance or facilitate engagement. The flow charts have been produced with wānanga and training processes in mind – using the steps (incl. reference to principles) as opportunities for education and awareness.

It is also recommended that councils and tangata whenua consider the illustrated process together to ensure it is fit for purpose for specific communities.

Engagement should take place across the entire NOF process and more broadly regional planning. The mahinga kai value is only a component of this. The flow chart is an option to use more broadly in engagement processes.

Suitable time is needed for engagement

An estimate of the **MINIMUM** time-range required for each step is provided in Figure 13-16.

- This is based on engaging with one iwi and it's hapū.
- These are high level estimates.
- The overall process, including multiple iwi and hapū, and enabling korero and wānanga between iwi and hapū, will take considerably longer.

The December 2024 deadline will make it particularly hard for completing these processes in time. Councils will need to be aware of this risk and commence engagement as a priority (if not already underway). A key recommendation is that tangata whenua and councils co-develop an engagement plan, so that all parties are aware of time constraints in the context of time-dependent legal requirements that councils have to comply with.

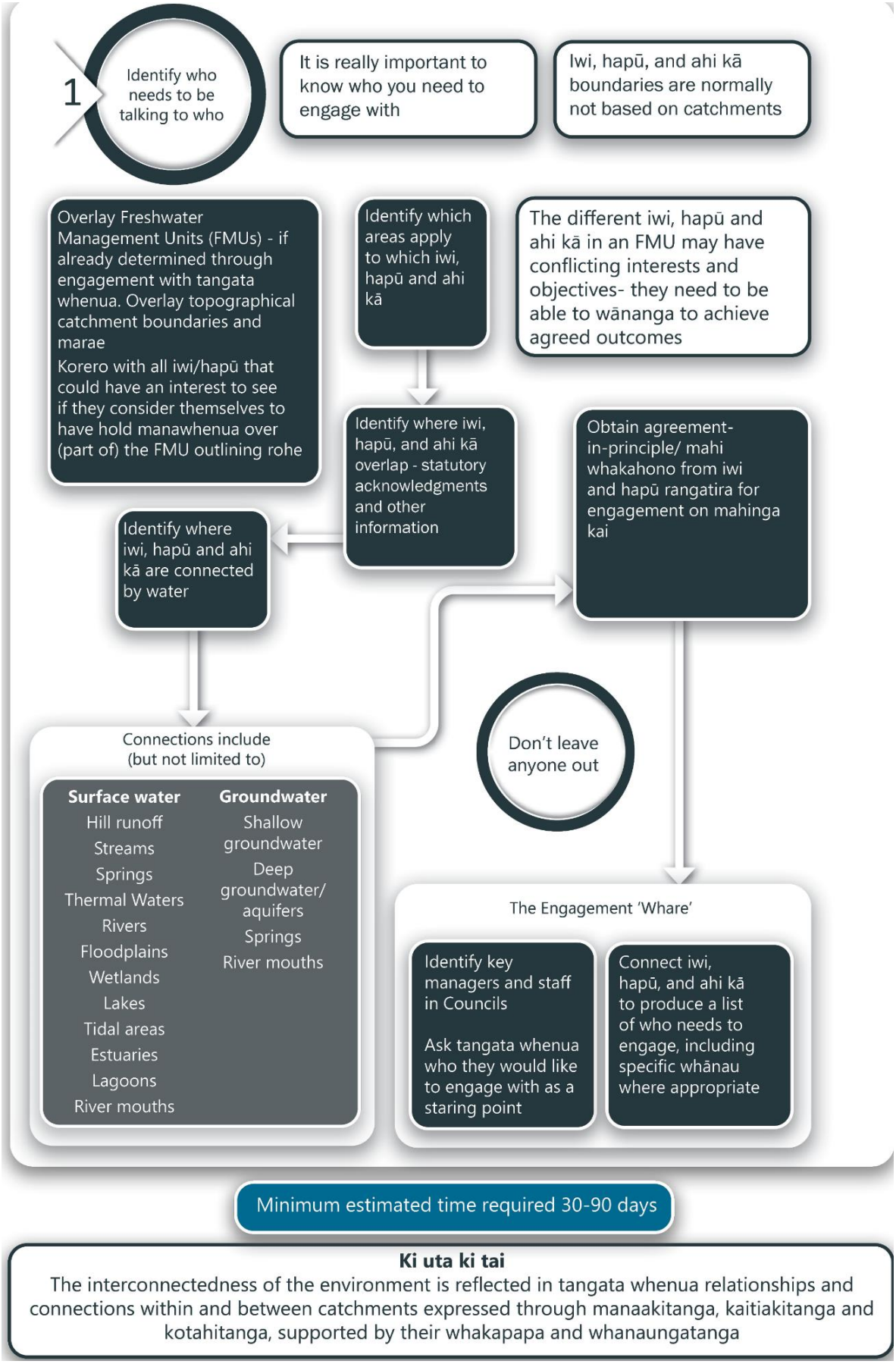


Figure 8.Step 1 – Identify who needs to be talking to who

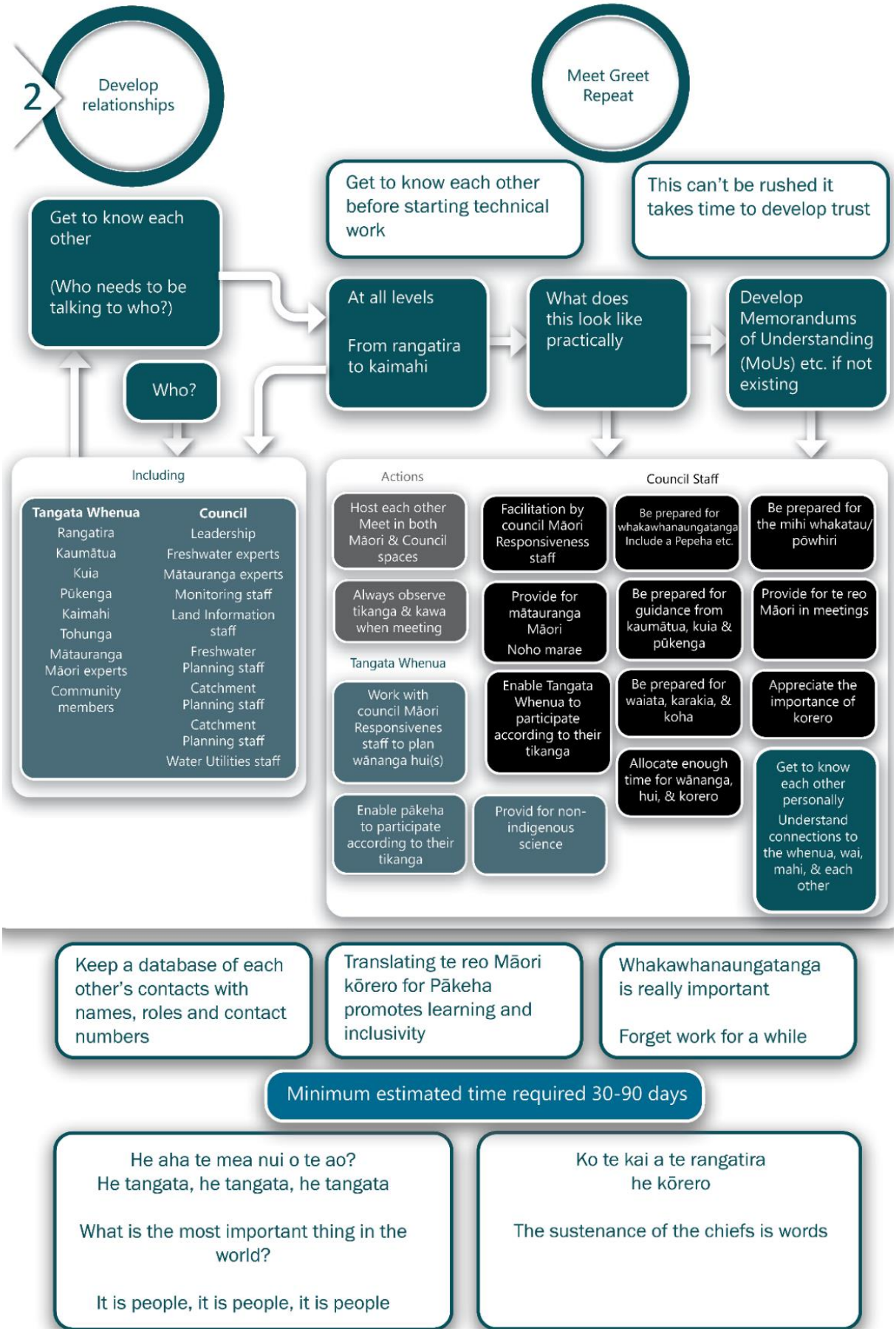


Figure 9. Step 2 – Develop relationships

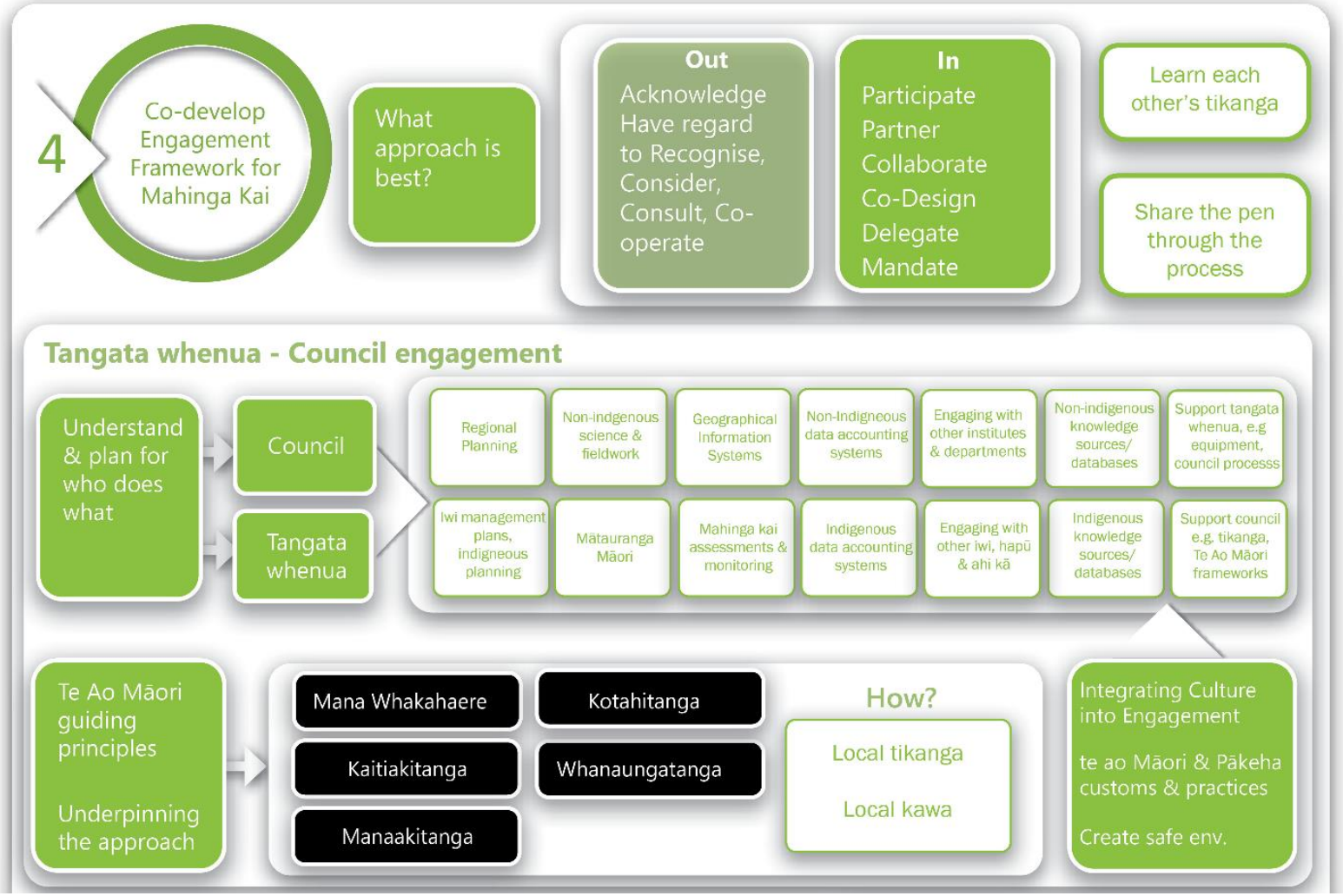


Figure 10. Step 3: part A – Co-develop engagement framework for mahinga kai

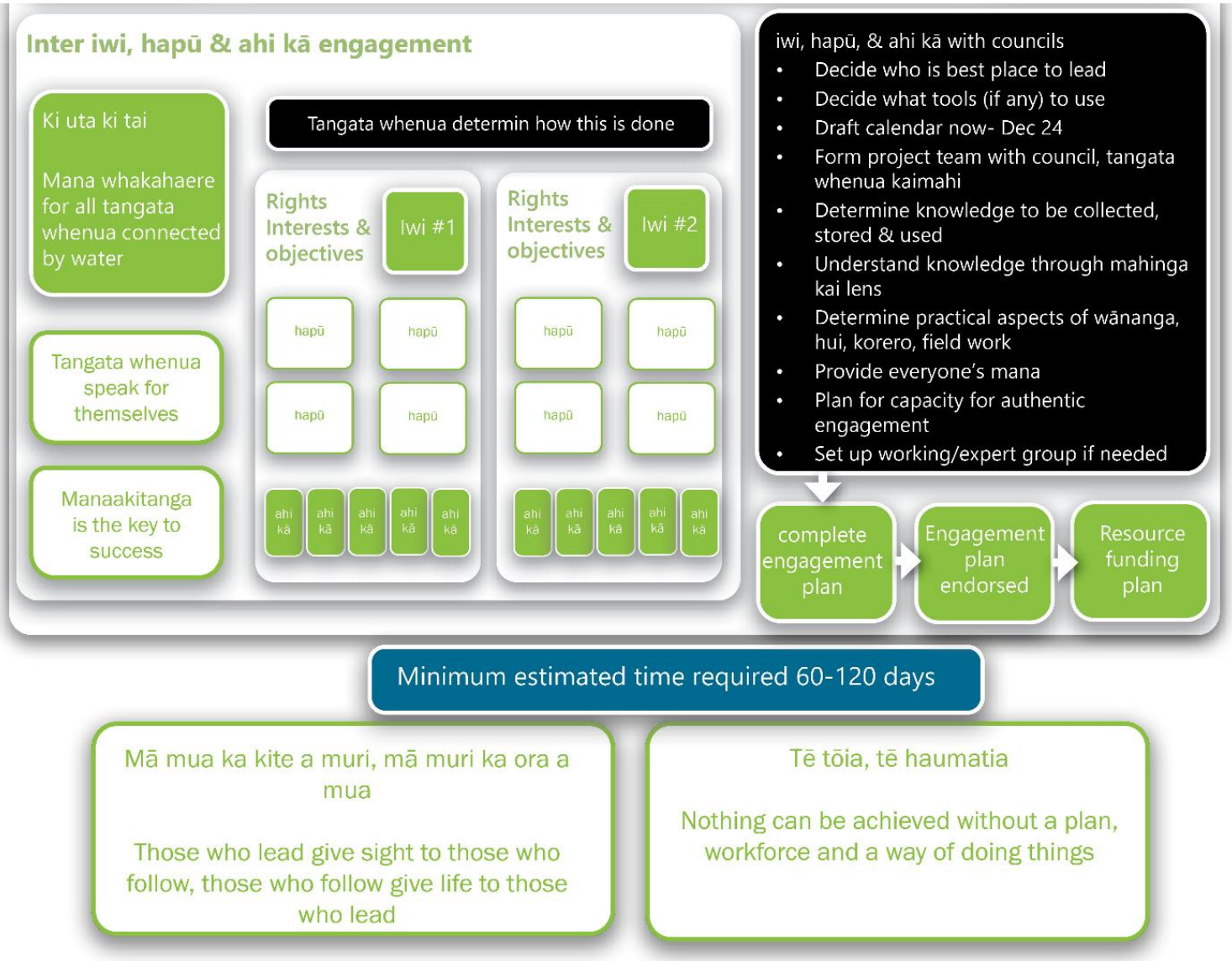


Figure 11. Step 3: part B – Co-develop engagement framework for mahinga kai

Engagement checklist

The following table (Table 7) adapted from Tipa & Severne (2010), can be used to see how effective engagement has been. It can also be used to plan engagement. This can also be downloaded at the following link: Including Mātauranga Māori in Environmental Flow Setting Decisions

Table 7. following link: Including Mātauranga Māori in Environmental Flow Setting Decisions

Criteria		Y/N
Interest of Stakeholders, Communities	• Stakeholder and partner interests informed the process. • Stakeholders had opportunities to identify their interests. • Their interests are reflected in the outcome of the process. • Their interests are linked explicitly to engagement outcomes. • Values of stakeholders informed decisions.	
Interests of Māori	• Tangata whenua were involved in designing the engagement plan. • Interests of tangata whenua informed the overall process. • Tangata whenua had opportunities to identify their interests. • Their interests are linked explicitly to engagement outcomes. • Tangata whenua informed the decision-making process.	
Treaty of Waitangi **Waitangi Tribunal**	• Participants in the process are bound by the Treaty clause & provide for it in their operations. • There are agreed interpretations of Treaty obligations between tangata whenua & participants in the process. • Tangata whenua have been asked to articulate what the Treaty obligation means in relation to mahinga kai assessments and engagement processes. Treaty obligations are linked specifically to mahinga kai and the NOF process. • The Treaty was recognised and provided for in the process. • The Treaty was recognised and provided for in decision-making.	
Legislative context	• Resource laws recognising interests of Crown, tangata whenua & stakeholders are reflected in the process. • Resource laws recognising interests of Crown, tangata whenua & stakeholders are reflected in the decision.	
Organisational context	• There is a formal relationship between tangata whenua & councils. • There are established and agreed communication processes between parties. • Councils and tangata whenua have adequate capacity, capability, and resourcing to effectively engage. • The interests of tangata whenua are presented in a format easily understood by councils. • The obligations of councils are presented in a format easily understood by tangata whenua.	

Criteria		Y/N
Procedural context	• The principles of mana whakahaere, kaitiakitanga, and manaakitanga were integrated throughout the process. • Stakeholders, tangata whenua, and councils are capable of expressing their interests & knowledge. • Stakeholders, tangata whenua, and councils demonstrate an understanding of the process and mahinga kai. • Tangata whenua explicitly link their interests to mahinga kai. • Tangata whenua and stakeholders actively participated at all relevant stages in the process, being able to convey their interests, knowledge and aspirations. • The policy framework used by the decision makers has tangata whenua interests reflected in all parts of this framework. • The decision-making process treated all stakeholders and tangata whenua equally.	

6 Tools

Introduction

Several tools are provided in this section. These are not directive; they are options for tangata whenua and councils to consider. Tangata whenua and councils may wish to **develop their own approached and solutions**. The particular suite of tools in this report may best be used together as shown in Figure .12 Combining tools in the process Figure .12.

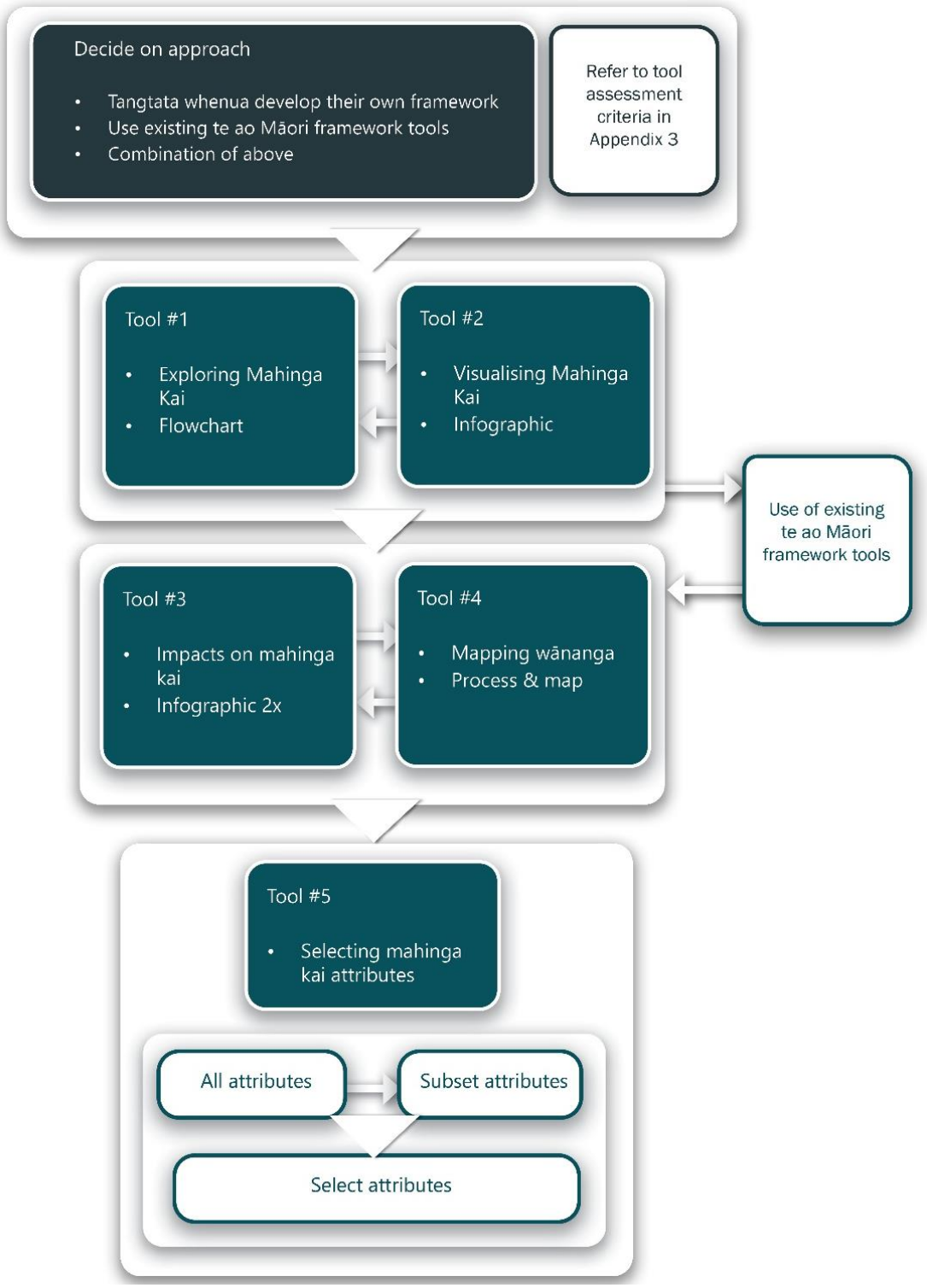


Figure .12 Combining tools in the process

Existing tools

Introduction

There are a number of existing te ao Māori framework assessment tools that tangata whenua can choose to use when implementing the NPS-FM mahinga kai requirements.

Tools have application in setting environmental outcomes for values, developing attributes, determining target attribute states, and working down to setting limits, management methods, and developing action plans. There are also good tools for developing higher-level long-term visions, goals, and identifying additional Māori freshwater values. This kete provides information that may help tangata whenua choose the tool(s) they like.

As part of this report, the authors developed a criteria that may be used to understand the relevance of applying existing tools/new tools for the purpose of implementing mahinga kai as directed by the NPS-FM 2020. The criteria which can be used for assessing te ao Māori tools are detailed in Appendix **3 of this report**, and broadly may be used to determine:

- To what extent are they relevant to specific NPS-FM 2020 provisions
- To what extent do they **enable the doing** / provide the practical 'on the ground' / 'operational' / 'flax-roots' information that kaimahi Māori and council employees need, to do the work

How to interpret the criteria in Appendix 3

The subset of existing tools was assessed by use of intuitive colour coding.

Green blocks indicate high relevance to criteria, followed by blue, then yellow.

Please note: This set of criteria may overlook some aspects and may not be able to capture the full intent and application of the tool being assessed. It is recommended tangata whenua undertake independent assessment of which tool may best suit their needs.

An overview of existing tools

Many great tools have already been developed, which can be used in navigating your way through the mahinga kai NPS-FM provisions (list resource list at the end of this section). Based on the criteria in Appendix 3 we assessed 10 tools (detailed under resources list (2) below)) and made the following observations:

- A significant number of tools have been produced, with varying applicability to the NOF. They range from general framework tools all the way through to being specific for the NOF process.
- Collectively the tools cater for all aspects of mahinga kai as a value (as defined, in the NPS-FM); however, the level of detail on mahinga kai varies significantly between the tools.

- The less tangible aspects of mahinga kai (e.g., personal relationships with the wai) and 'invisible' impediments to the practice of mahinga kai (e.g., land legal access issues) are also covered in some tools.
- While the outcomes of all tools can be mapped, some are more focussed on spatial outputs.
- The tools are generally not pitched at the scoping, design, and implementation of 'on-the-ground' projects (as would be expected of framework tools).
- All of the tools require some specialised skills and training due to their complexity and process demands; for example, a working knowledge of tikanga Māori is critical.
- Tool outputs are not always intuitive and easy to use in engagement.
- While all tools can be used for freshwater assessments, some tools are more specific to freshwater, catchments, and the NOF. All can be applied to catchment approaches.
- Estuaries and river mouths are generally provided for, recognising the principle of Ki uta ki tai.
- The tools can all be adapted to cater for different scales, although some are more targeted at catchments as opposed to local place-based outcomes.
- Most tools are not intrinsically set up to measure change over time (i.e., but can be adapted for that purpose.
- Practical 'on-the-ground' monitoring guidance is largely absent.
- All tools recognise the need for tangata whenua-led processes, as well as the critical role of mātauranga Māori.
- The tools generally recognise the value of non-indigenous science approaches, and they vary in their integration of mātauranga Māori and non-indigenous science.
- Little detail is provided on practical aspects for tangata whenua – council relationship building, and each other's roles and responsibilities.
- Existing tools have varied relevance / application to the NPS-FM and the NOF. Some specifically referenced the NPS-FM and NOF, while others did not at all. This was partly related to when the tools were created.

Key resources:

(1) Te ao Māori framework assessment tools: examples including cultural indicators and frameworks for monitoring.

- Summary review of mātauranga Māori frameworks, approaches, and culturally appropriate monitoring tools for management of mahinga kai (Shaun Awatere & Garth Harmsworth, 2014)
- A review of indicators used for 'cultural health' monitoring of freshwater and wetland ecosystems in New Zealand (Craig Bishop, 2019)
- Method 44 Developing Mauri Models Report (Boffa Miskell, 201&)
- Cultural indicators, monitoring frameworks and assessment tools (K. D. Nelson, G.T Tipa, 2012)
- Review and evaluation of cultural monitoring approaches in New Zealand (Garth Harmsworth & Shaun Awatere, n.d.)

(2) Examples of tools that may be assessed for setting values, attributes and monitoring methods for mahinga kai.

- Awatere, S., Robb, M., Taura, Y., Reihana, K., Harmsworth, G., Te Maru, J., Watene-Rawiri, W. (2017). Wai Ora Wai Māori – a kaupapa Māori assessment tool. POLICY BRIEF NO.19 (ISSN: 2357-1713) ï KAUPAPA MĀORI ASSESSMENT TOOL JUNE 2017. Link: https://bit.ly/30ARQ4b
- Tipa, G. (2010) Consideration of a significance assessment method for tangata whenua river values. Source: Hughey, K.F.D., Baker, M-A. (eds). (2010b). The River Values Assessment System: Volume 2: Application to cultural, production and environmental values. LEaP Report No.24B, Lincoln University, New Zealand. Chapter 8 Tangata whenua. Link: https://bit.ly/3ixZs3B
- Tipa, G. & Severne, C. (2010) Including Mātauranga Māori in Environmental Flow Setting Decisions. NIWA Client Report: HAM2010-030. NIWA Project: MFE10301.
- Ruru, I.H. & Kanz, W.A. (2020) The Mauri Compass – a Mātauranga Māori Tool for Assessing the Mauri of Water. Version 02. Link: https://bit.ly/3mwMWTo
- Tipa, G. & Terney, L. (2006) A Cultural Health Index for Streams and Waterways: A tool for nationwide use. A report prepared for the Ministry for the Environment. ISBN: 0-478-25950-6 ME number: 710 | The Cultural Health of the Opihi Catchment. Working with: Te Runanga o Arowhenua Prepared by: Tipa and Associates Ltd Updated June 2018. Link: https://bit.ly/30xTtj4
- Tipa, G. & Teirney, L. (n.d.) Introducing the cultural health index. Powerpoint presentation, NIWA. Link: Introducing the Cultural Health Index
- Morgan, T. K. K. B. (2011) Waiora and cultural identity. Water quality assessment using the Mauri Model. AlterNative: An International Journal of Indigenous Peoples, 3(1) | Morgan, T. K. K. B. (2007) Translating values and concepts into a decision-making framework: application of the Mauri model for integrated performance indicator assessment. National Workshop, 2007 Wisconsin, USA. Roundtable on sustainable forests: A partnership for the future. Relevant links: https://bit.ly/3mvXOjX, http://www.mauriometer.org/WebPage/Show/3, Waiora and Cultural Identity: Water quality assessment using the Mauri Model
- Morgan, T.K.K.B. (2006). Decision-support toola and the indigenous paradigm. Proceedings of the institute of Civil Engineers: Engineering Sustainability. 159(4): 169-177. Link: Decision-support tools and the indigenous paradigm
- Tipa & Associates (n.d.). Cultural Opportunity, Mapping, Assessments, and Responses. Website. Link: https://bit.ly/303C6fR

(3) Other framework tools and applications which can be used in a freshwater context

- Te Kete Tua-ātea, Māori modelling of the future and the kaitiakitanga of water – Master's thesis (Mahina-a-rangi Baker, 2019)
- Coastal Cultural Health Index (Manaaki Taha Moana, n.d.)
- Maniapoto Cultural Assessment Framework (NIWA, 2020)
- State of Takiwā (Craig Pauling et al., 2007)
- Estuarine Trophic Index Toolkit (ETI) (NIWA, n.d.)
- Environmental flows - publications (NIWA publication library)
- Māori outcome evaluation: A kaupapa Māori outcomes and indicators, framework and methodology (Richard Jefferies & Nathan Kennedy, 2009)
- Ngä Mahi: Kaupapa Māori Outcomes and Indicators Kete (Richard Jefferies & Nathan Kennedy, 2009)

- Environmental performance outcomes and indicators for indigenous peoples: Review of literature (Richard Jefferies & Nathan Kennedy, 2009)
- Kaupapa Māori framework and literature review of key principles (Richard Jefferies & Nathan Kennedy, 2009)
- Examples of the use of framework tools / cultural assessments:
- Wāhi Taonga and Mahinga Kai (ecan, n.d.)
- The Cultural Health of the Opihi Catchment (Tipa & Associates, 2018)
- Cultural impact assessment Ōtakāro/Avon River stormwater (K4 Cultural Landscape Consultants, 2015)

Tools developed for this kete

Kete Tool #1: Exploring mahinga kai

Mahinga kai is specific to different iwi, hapū, marae, ahi kā, and whānau.

Infographics to help you work through this are provided (Figure 13 and Figure 14). These enables **'discovery'** phase. Figure 13 does not provide examples of species used in mahinga kai. These can include any number and range of plant and animal species, is specific to tangata whenua. Similarly, examples of wāhi taonga relate to waterbodies, their margins, and mahinga kai are not included.

Tangata whenua and councils can independently or collectively use Figure 13 and Figure 14 as part of a **discovery phase** on mahinga kai, using the tool to:

- Explain how an attribute (tohu) is used as an indicator and how it fits in with freshwater values
- Describe mahinga kai aspects that tangata whenua identify with in an area
- Facilitate collaboration between non-indigenous science and mātauranga Māori experts
- Improve understanding of mahinga kai
- Develop ideas on how best to work together
- Understand the unique merits of non-indigenous science and mātauranga Māori within the process
- Begin information sharing, as appropriate
- Develop project / programme plans for the NOF process
- Improved understanding of a te ao Māori worldview

About the flow chart tool (Figure 13)

The flow chart below is an 'ideas bank' that stems from wānanga with mahinga kai practitioners.

Mahinga kai can be unique and specific to tangata whenua. Some aspects of the flow chart will have no relevance to some iwi, hapū and whānau. Others will be seen as vital. The flow chart is a starting point for discussion.

Please note: This flow chart is intended to be used in a wānanga / training setting, with extra 'sticky notes' provided for additional input / information from tangata whenua and councils.

How to interpret Figure 13 and Figure 14

Attributes are separated into conventional State of the Environment / Non-indigenous Science and te ao Māori worldview / cultural types. While information sources are shown to differ between the above, they can (and should) support each other.

Regarding Māori freshwater attributes:

- It can be difficult to differentiate between values and attributes, because of the holistic nature of a Māori worldview. While this tool provides a list of Māori freshwater attributes (incl. mahinga kai) – iwi, hapū, and whānau may identify some of these 'attributes' as values.
- We have also provided the attributes as Māori freshwater attributes, purposefully not distinguishing between these and mahinga kai attributes – this is because views on what constitutes mahinga kai can vary between different iwi, hapū, and whānau.
- There are overlaps between Māori freshwater attributes categories (Sensory, Relational, Resources, Places, Water) – this is on purpose and reflects the inter-connectedness / holistic aspects of mahinga kai.

Mapping for te ao Māori worldview / cultural attributes is termed 'relational' because all attributes will relate to tangata whenua customs, practices, relationships, and connections.

Mapping for State of the Environment / Non-indigenous Science is unlikely to be 'relational' to tangata whenua i.e., it is data not necessarily with direct application to tangata whenua.

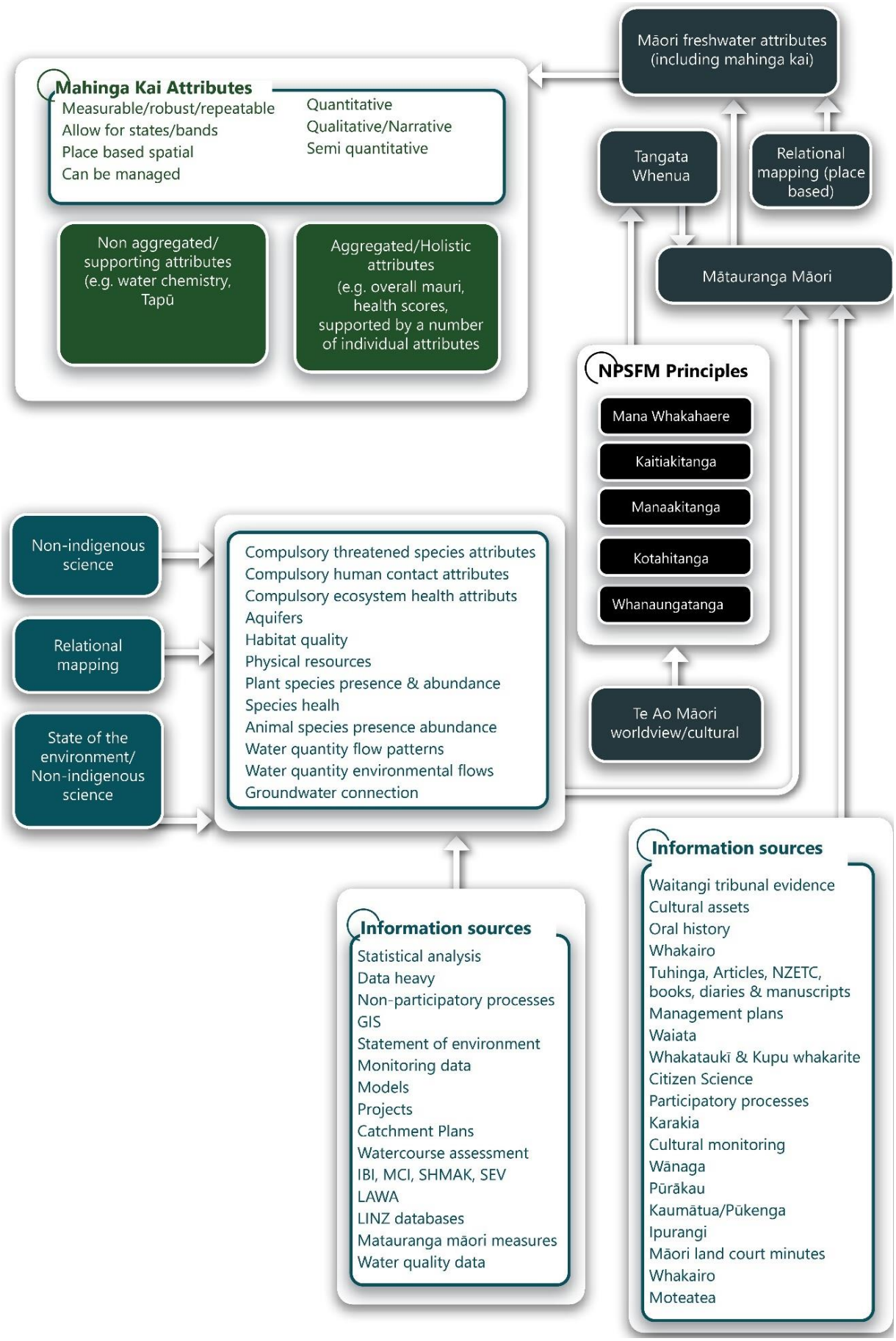


Figure 13. Mahinga kai attribute flow chart

Māori freshwater attributes (including Mahinga Kai)

Our Senses

- Touch, sight, hearing, smell, & taste
- Maramataka Moon phases, stars, seasonal
- Energy levels
- Wairua
- Mauri
- Cleansing
- Muddiness
- Riffles
- Sights
- Whitewater
- Water temperature
- Feel e.g. greasiness
- Colour & appearance e.g. sheens, foams
- Sounds
- Sights

Connections & Relationships

- Whakapapa
- Atua
- Tuakana Teina
- Karakia
- Tapu
- Noa
- Tipua & taniwha
- Mauri
- Reciprocity
- Maramataka Moon phases, stars, seasonal
- Tikanga
- Whakanoa
- Manaakitanga
- Kaitiaki
- Connections to past, present, & future
- Rāhui
- Wairua
- Sharing with whānau
- Sharing with manuhiri
- Knowledge including transfer
- Traditional use
- Taonga
- Kaihoe waka kaikotikoti, kai
- Places
- Trading
- Travel distance
- Kaimahi/Jobs

Resources in/near water

- Rongoā/medicine
- Plant (water/land)
- Birds
- Rocks/stones
- Taonga
- Berries,seeds,leaves
- Manamataka
- Feathers
- Muds,clays
- Thermal waters
- Tools
- Native species
- Bark for burial
- Flaxes
- Rain
- Animals (water/land)
- Non native species
- Fibre
- Materials for weaving, fires, carving, hunting, fishing, etc

Physical linkage

- Ki uta ki tai
- Riparian margins
- whenua, wai connection
- Natural meanders
- Connected nohoanga
- Habitat
- Whakapapa
- Rain
- Journeys
- Navigable
- Swimming
- Floodplains
- Connected waterbodies
- Tauranga ika
- Ara tāwhito
- Fish Passage

Places

- Wāhi tapu
- Pā
- Urupā
- Places of historical significance
- Battlegrounds
- Waipuna
- Places for cleansing
- Places for baptism
- Puna/springs
- Taniwha
- Wāhi taonga
- Repo Raupō
- Thermal waters
- Place of learning
- Navigation spots
- Nesting grounds
- Cultivation areas
- Fishing areas
- Tauranga waka
- Caves
- Ara tawhito
- Ikoa Wahito
- Kai gathering sites
- Stops on journeys
- Wāhi Kohātu
- Permanent, seasonal, temporary occupation
- Traditional campsite
- Nohoanga
- Kainga nohoanga
- Umu
- Waiariki
- Wairākei
- Middens
- Oven Pits
- Terraces
- Ceremonies
- Mātaitai
- Wāhi paripari
- Waitangi
- Taiāpure
- Waiwera
- Wāhi ingoa
- Ara tāwhito
- Tangihanga
- Drinking water
- Tuhituhi onehe rā

Water Quantity

- Taonga
- Seasonal maramataka
- Drinking water
- River crossings
- Springs protected
- Behaviour
- Water for plants
- Flow for mahinga kai
- Changes in animal life
- Floods
- Waka
- Flows in dry months
- Form & character
- Changes in plant life
- Water depth
- Deep pools
- Width of river in summer
- Variability

Water Quality

- Taonga
- Smell
- Drinking water
- Colour/Appearance
- Feel
- Mirroring
- Safe to eat kai
- Swimming
- Issues of tapu
- Clarity
- Travel distance
- Streams are shaded
- Temperature

Figure 14. Māori freshwater attributes

Kete Tool #2: Visualising mahinga kai

Tangata whenua and councils can independently or collectively also use the infographics in this section as part of a **discovery phase** on mahinga kai.

The infographics have been produced with wānanga and training processes in mind as opportunities for education and awareness.

- Figure 15, is an annotated photo collage illustrating connections and relationships of tangata whenua to freshwater.
- Figure 16, illustrates the vast range of mahinga kai resources
- Figure 17, illustrates the ki uta ki tai concept, showing the inter-connectedness of waterbodies, the wide range of waterbodies relevant to mahinga kai, and issues that affect mahinga kai. Blue borders illustrate the wide range of relevant water bodies. Red borders relate to urban impacts on mahinga kai, while orange borders relate to rural issues. The yellow triangle represents Māori lore, reflecting their traditions, practices, and histories, including customary controls such as rāhui. The green triangle represents Pākehā law, reflecting non-indigenous controls, regulation, and legislation. The green and red arrows represent the potential for positive and negative change.
- High resolution versions of these infographics can be downloaded from: https://www.mahingakai.com/kete.html

These infographics are intended to be used in education and awareness settings, and when exploring mahinga kai in a wānanga setting.

Figure 15. Visualising mahinga kai

Figure 16. Infographic - mahinga kai 'resources'

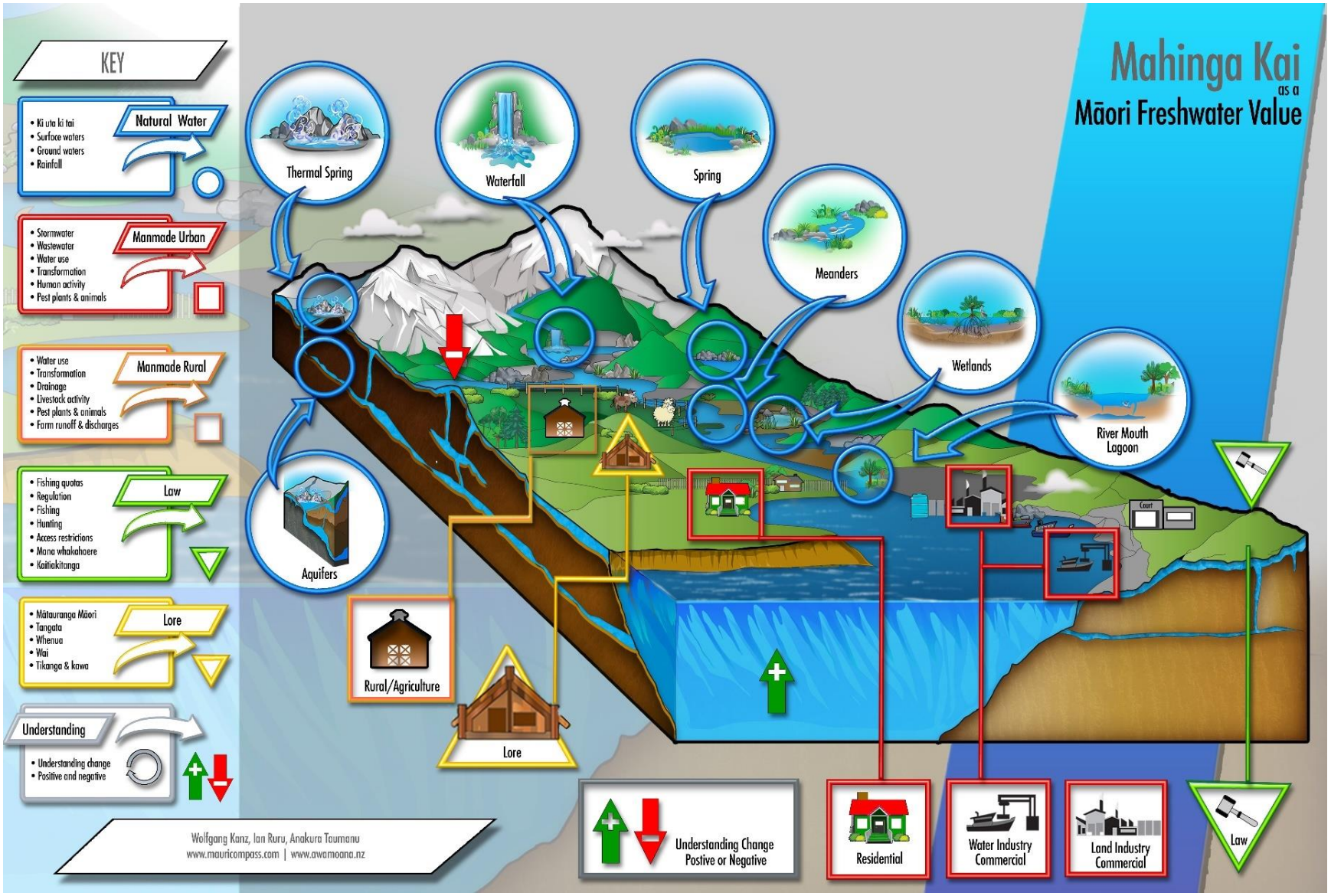


Figure 17. Infographic - waterbodies within a catchment, relevant to mahinga kai.

Kete Tool #3: Invisible and visible impacts on mahinga kai

Tangata whenua consider that a poor state of freshwater in Aotearoa New Zealand is matched by a similar 'erosion' of mahinga kai customs and practices - which has come about as a result of a physical and socio-political disconnection of tangata whenua with freshwater.

Impacts may be viewed holistically, or in a cumulative context. As a whole they affect mana whakahaere, kaitiakitanga, and manaakitanga, and the mauri of a waterway can be considered an indicator of cumulative impacts.

While overlaps are unavoidable and it is difficult to categorise impacts, the following broad categories were considered:

- Invisible
    - Planning / Regulation
    - Access restrictions
    - Controls / restrictions on customary fishing rights
    - Knowledge
- Visible
    - Species threats
    - Water quality
    - Hydrological alteration
    - Land impacts

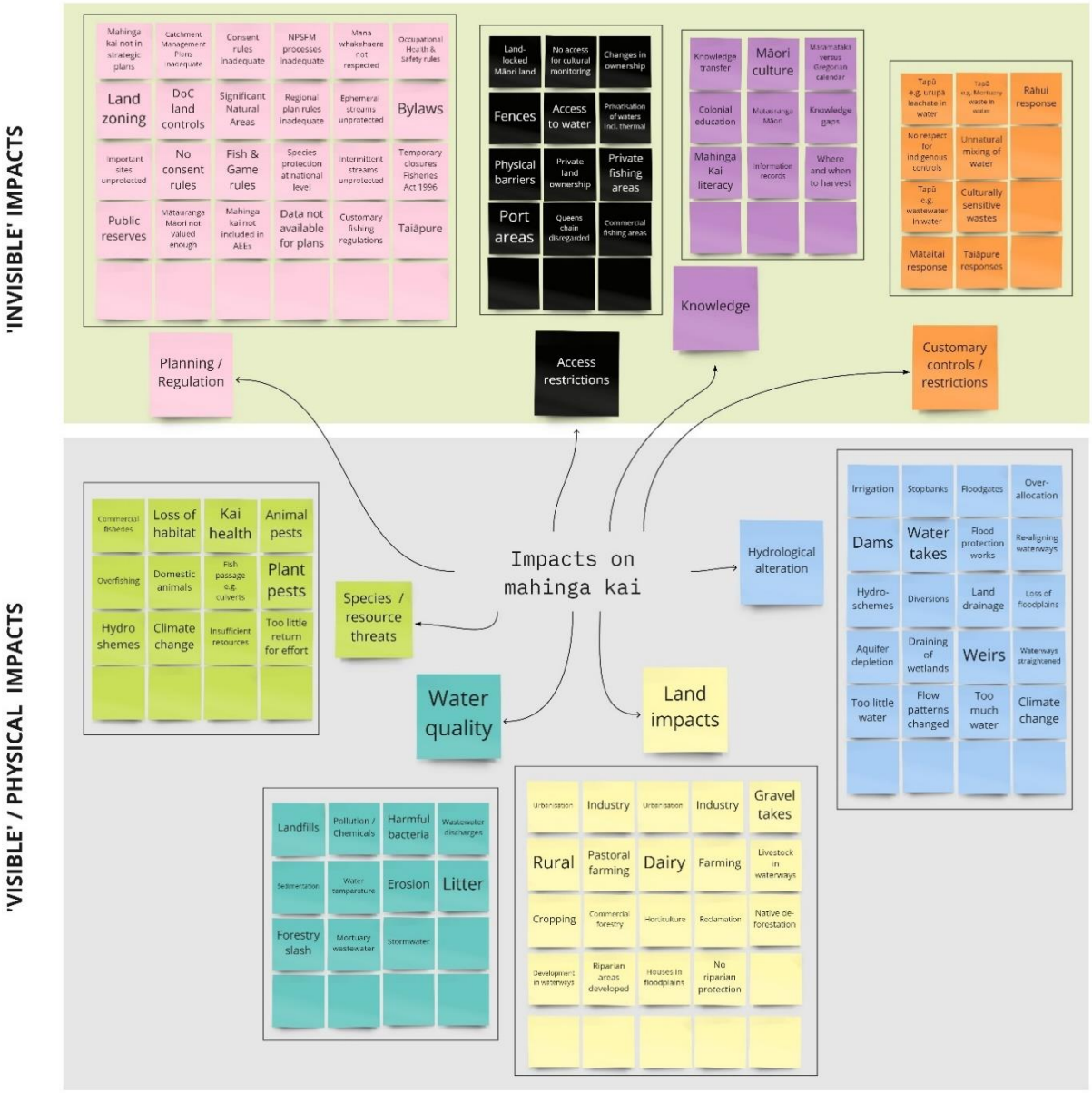


Figure 18. Infographic –Flow chart example of process to map visible and invisible impacts on mahinga kai

This flow chart example used above is intended to be used in a wānanga / training setting, with extra notes provided for additional input / information from tangata whenua and councils. See the detailed version of visible and invisible impacts in Figure 19 and Figure 20.

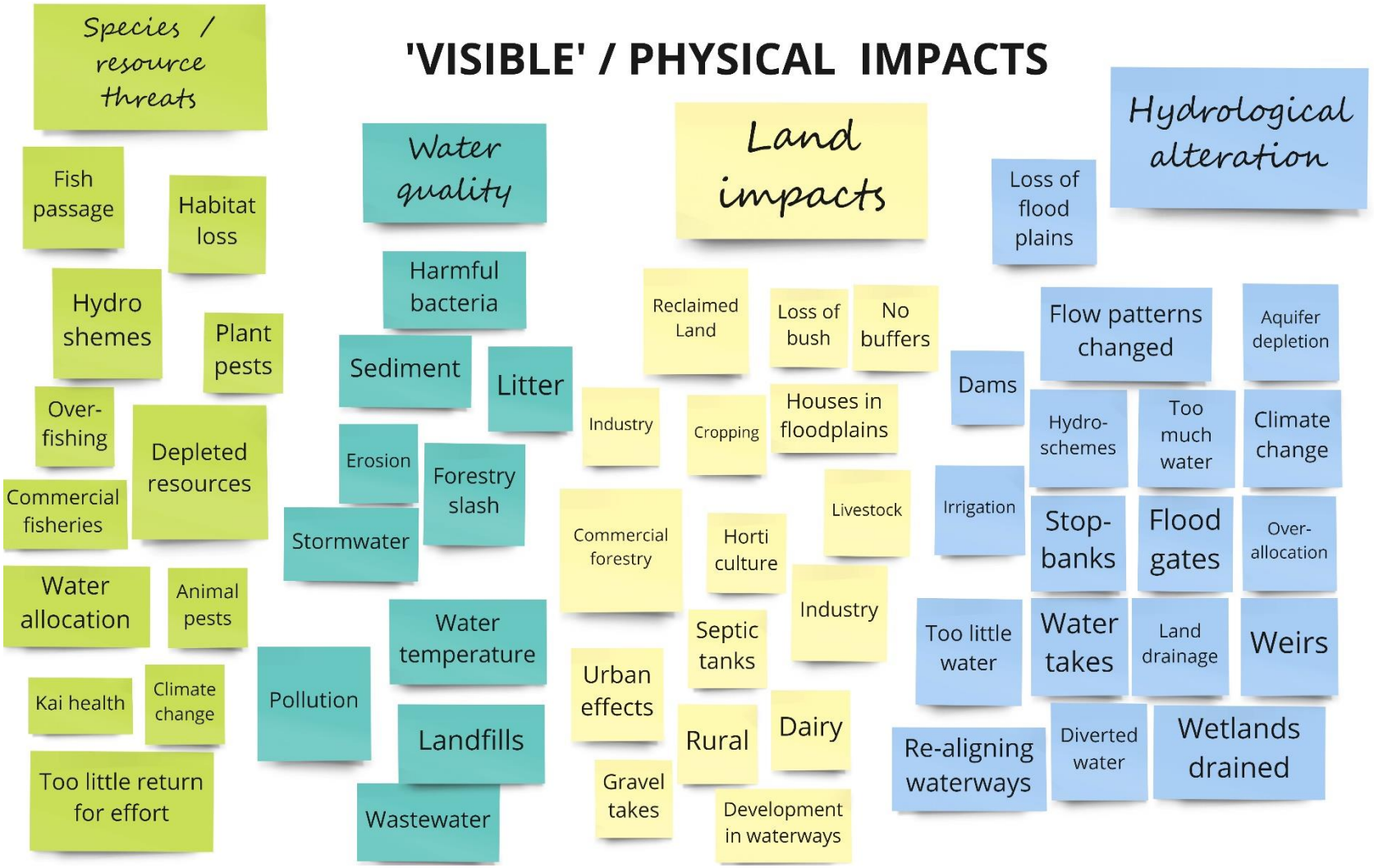


Figure 19. Infographic - Flow chart example: detail on visible impacts on mahinga kai

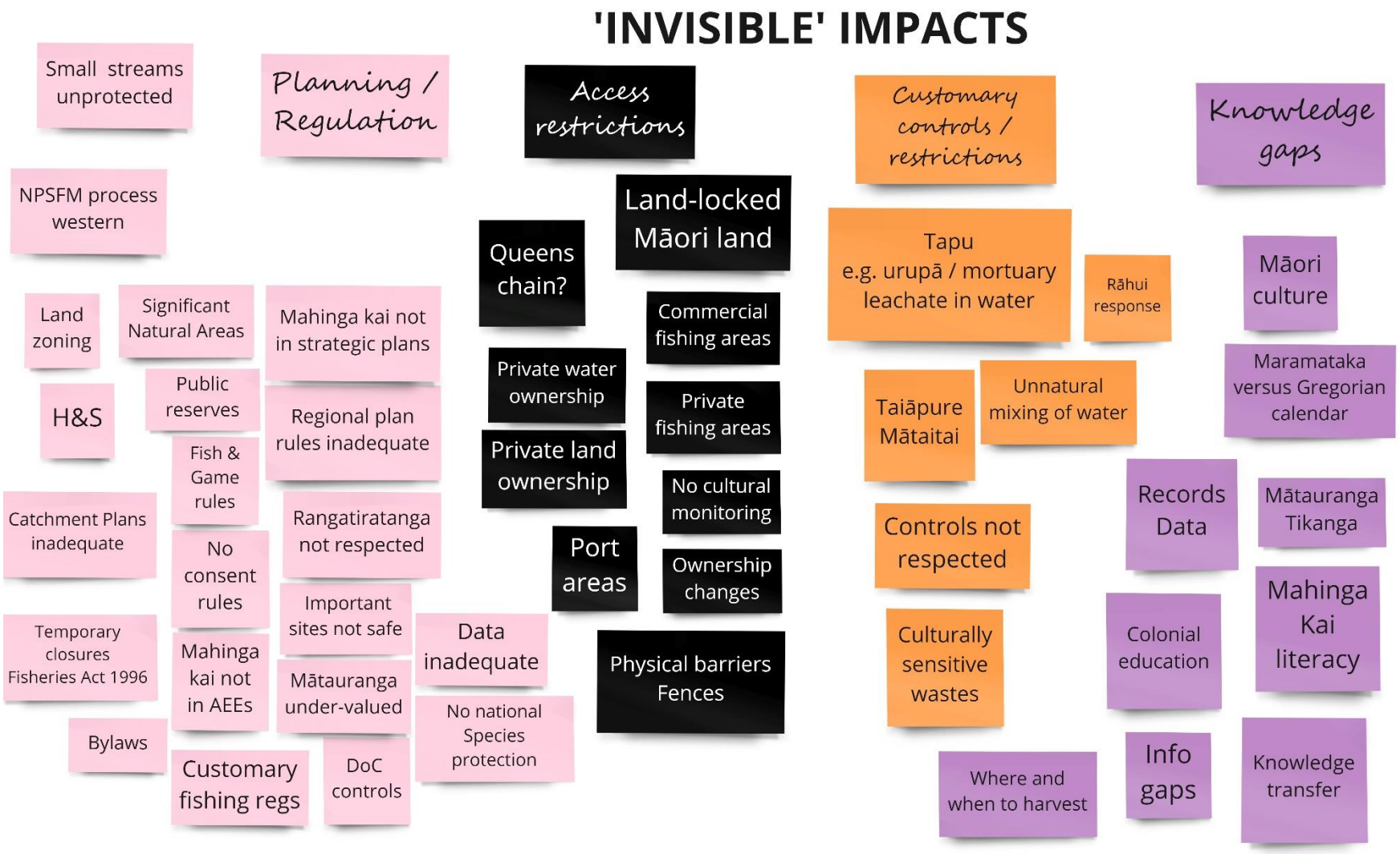


Figure 20. Infographic - Flow chart example, detail on invisible impacts on mahinga kai

Kete Tool #4: Mapping wānanga

The process below is derived and summarised from interviews conducted through the development of the kete. It provides a means of identifying mahinga kai values and attributes. This process may also be applicable to identifying other Māori freshwater values.

Table 8. Undertaking a mapping wānanga with tangata whenua

Steps	Description
1	Meet at the marae with local mahinga kai practitioners, kaumātua, kuia, pūkenga, local mātauranga Māori experts, and other knowledgeable whānau. *Note*: The purpose of the meeting is clearly articulated before the wānanga. Tangata whenua and councils are both aware that the wānanga will include mapping, and that any existing spatial information (recorded or otherwise) will be of value to the kaupapa.
2	If agreed, include non-indigenous science experts from the council.
3	Start by making sure all parties understand the kaupapa and consider high level questions.
	Question examples: • What is the NOF and NPS-FM? • What is mahinga kai? • What does it mean to us? • Why is this important? • What is the ultimate aim / objective?
4	Use a map with freshwater features overlaid – the council could produce this map and use it as a means of showing tangata whenua what information council already has. Mapping on an aerial photo is best for workshopping place-based topics. This map would be a starting point for wānanga. It is best if the map is printed at large scale. A good start is to verify the names of waterbodies – this is an opportunity to share information about them and for tangata whenua to provide their perspectives and personal knowledge / experiences.
5	As a group then explore the map from maunga (mountain) to moana (sea), in line with ki uta ki tai. Important places, practices, resources, etc. can be marked up on the map. Impacts and threats relevant to mahinga kai can also be marked up. Councils may also share their information.
6	State of Environment (or other) monitoring information from councils, and monitoring information from tangata whenua, can be discussed as a first step in understanding the condition of the wai and the range of information currently available.
7	Significant time must be spent on documenting tangata whenua connections and relationships with the wai. Some of this will be recorded in text while some will be in other forms (such as pūrākau, karakia, waiata, etc.).
8	In some cases there may be limited information available - the approach then is to apply a te ao Māori customs and practices lens onto the resources that would have been expected there, with reference to similar sites. An expert panel can also be selected by tangata whenua to help where data is deficient.

Steps	Description
9	Iwi, hapū, marae, ahi kā, and whānau rohe(s) can be mapped, helping identify relevant parties and potential engagement approaches. Significant private landowners can also be identified.
10	At this stage explore relationships between Māori collectives and enable tangata whenua to plan for their engagement processes.
11	Opportunities for improving mahinga kai can be workshopped and mapped, making these spatially relevant to places, practices, resources, etc. Current and planned projects can be mapped. Project mapping may require significant coordination across various Council departments.
12	The mapping process must allow for information sharing in a 'safe' working environment. Some information collected will belong to tangata whenua and will need to be respected and protected in the process.
13	Mapping could then be expanded on with information obtained through additional wānanga, hui, fieldwork, and literature reviews. Be prepared for multiple wānanga, which will take time.

Kete Tool #5: Selecting mahinga kai attributes

Practical implementation of a large number of attributes is complex, and the process should provide for the development of a manageable set of attributes.

The project team tested potential approaches with tangata whenua. Tangata whenua and councils may consider the option in Table 9. Working towards a manageable set of attributes

Table 9. Working towards a manageable set of attributes

Step	Task / action
1	Start off discussions with tangata whenua on kaupapa (principles) and matapono (values), also referencing to iwi/hapū management plans, strategic plans, etc. Mahinga kai can then be placed into the broader kaupapa. Use this korero to identify existing values frameworks, and then the attributes of those values in relation to mahinga kai. This will form a good platform for subsequent inquiry into mahinga kai as provided for in the NPS-FM. It is best if we start at a high level: • What is our history? • What are our goals? • What are our kaupapa and matapono? • What outcomes do whānau want to achieve for mahinga kai? • How do these relate to our kaupapa and matapono? This includes creating a platform for sharing indigenous knowledge, including pūrākau, waiata, personal experiences, and histories.
2	Identify how the values can be placed in the context of the compulsory NOF mahinga kai value, and whether additional Māori freshwater values are necessary. The NOF provides for tangata whenua to interpret and measure mahinga kai in the way they see necessary. Inquiry - What do the mahinga kai values in the NPS-FM mean to tangata whenua? • Mahinga kai – kai is safe to harvest and eat • Kei te ora te mauri (the mauri of the place is intact) This should start off as a general discussion, thereafter, delving into detail. Allow enough time for knowledgeable whānau to share their understanding and information.
3	Identify all tohu (attributes) that contribute directly or indirectly towards a value. Consider the minimum requirements for attributes as detailed in the NPS-FM.
4	Tangata whenua determine what is relevant to them (incl. species).
5	Identify which attributes 'overlap' i.e., if you cater for one, which other attributes are also catered for? For example, if you cater for fish passage for īnanga then you cater for all fish passage. Table 10 illustrates what a subset of attributes can look like.

Step	Task / action
6	Tangata whenua may choose to produce a list of primary and secondary attributes. Secondary attributes may be achieved through primary attributes, may only be practically implementable once primary attributes have been progressed, or these can reflect prioritisation. The approach depends on tangata whenua.
7	The subset of attributes chosen by tangata whenua was on the basis that all attributes together will collectively achieve their mahinga kai objectives.

The above approach was tested by an iwi, which resulted in five attributes being chosen (Table 10).

Table 10. Attributes selected for their collective impact

Attribute	Role in mahinga kai
Kaitiakitanga is able to be exercised from rangatira to on-the-ground kaimahi	This addresses issues of access and involvement from planning through to project work and monitoring
Tuna are plentiful for customary practices, protocols, and as a food source, for the marae and whānau	This addresses the importance of being able to undertake mahinga kai as part of daily life and at meetings / cultural events.
Awa A and Awa B support piharau that can be sustainably harvested as a food source	This addresses water quality and habitat through a mātauranga Māori holistic approach as piharau are sensitive to water quality and sedimentation. This protects other taonga.
Riparian margins and wetlands can be used for rongoā, indigenous plants and animal (birds) kai, and rāranga	This addresses connections between the wai and the whenua, while also providing for the full range of mahinga kai to be undertaken. This protects other taonga.
Wāhi tapu and other sites of wai cultural significance are intact, can be visited and used, and have protections in place where needed	This addresses important places and areas that are linked to mahinga kai, both in terms of their condition, 'safety', and accessibility.

Measurable place-based attributes as per NOF requirements were developed for the above. An example is provided (mahinga kai at each stage of the NOF process).

Water quantity issues were not of significant concern for this particular iwi – if this was the case, then a water quantity attribute could have been developed.

Measuring baseline states and tracking progress against target attribute states could include numeric and or narrative methods (such as Likert scales). Table 11 is an example of how Likert scoring can be used to quantify cultural aspects of mahinga kai.

Table 11. Example of Likert scales used in the Mauri Compass.

Statement or question	**Scoring Scale**				
Tangata whenua are knowledgeable in mahinga kai tikanga	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5
Tangata whenua are knowledgeable in mahinga kai species	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5
The waterbody is used to provide kai for cultural gatherings such as hui and tangi	Never	Rarely	Occasionally	Frequently	Very Frequently
	1	2	3	4	5
Kaitiakitanga and rangatiratanga is respected in gathering kai / resources	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5
Rāhui / other controls (e.g., mataitai) are used to ensure sustainability	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5
Kaitiaki (pūkenga) of mahinga kai are known and engaged at the marae.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5

7 Mātauranga Māori & data sovereignty

Introduction

Mātauranga Māori directly translates as 'Māori knowledge or wisdom'. It encompasses skills, understanding, awareness and a deep, intricate knowledge passed down from generation to generation, for example through whakapapa (genealogy), waiata (song) and mōteatea (narrative poems). It is a systematic approach of observing, recording, analysing, and reviewing our interactions with the natural world.

https://environment.govt.nz/assets/publications/era-maori-engagement-infosheet.pdf

Mātauranga Māori is 'the unique Māori way of viewing the world encompassing both traditional knowledge and culture' (Waitangi Tribunal Report, 2011). Mātauranga Māori directly translates as 'Māori knowledge or wisdom'. Therein, a rich suite of mātauranga Māori repositories have been purposefully developed to retain, protect, and pass on knowledge. Some of these include whakapapa, mōteatea, waiata, whakairo, pūrākau, maramataka and mahinga kai. These such repositories, many of which are narrative in nature are robust, repeatable and transparent in their own right.

Mahinga kai 'data' is different to conventional datasets.

Protection of mātauranga Māori and data sovereignty are critical to tangata whenua.

Non-indigenous knowledge, however, is predominantly located in 'tangible' records such as reports and databases. What is important to recognise is that indigenous and non-indigenous knowledge have their own unique information currencies. It is imperative therefore, 'that the tools of one are not used to analyse the other' (Hikuroa, et al, 2011 as cited in Hikuroa, 2017).

"Mātauranga Māori is, first and foremost, mātauranga Māori in its own right" (Hikuroa, 2017).

Therefore, while not always recorded in documents, the transmission of knowledge from kuia, kaumātua and pūkenga in their respective fields presents distinct and relational insight into the past, present, and future, which cannot be captured through laboratory analyses. Moreover, this knowledge is viewed in the context of tangata whenua relationships with the physical and spiritual world and inform cultural baseline and target attribute states for mahinga kai.

Data sovereignty

Mātauranga Māori is a key mechanism for enabling self-determination and innovation and is concerned with protecting tangata whenua rights of access to data, participation in data integration activities, and partnership in the governance and / or ownership of data (Kukutai, 2018). Mātauranga Māori is a taonga. When it is shared it is a gift and should be safeguarded and treated with respect.

Tangata whenua have sovereignty over their mātauranga, data, and tikanga, with the above applied at various scales depending on tangata whenua.

Tangata whenua decide what is protected and what is shared - mātauranga Māori is specific to hapū / whānau – it links through to whakapapa & inter-generational sharing.

Data sovereignty I the context of the NPS-FM

- Data sharing between councils and tangata whenua will be crucial when implementing the NPS-FM 2020 however, in implementing mahinga kai as a value, processes and mechanisms must be put in place that safeguard sensitive mātauranga, intellectual property, and other information that mana whenua want protected.

Principles underpinning data sovereignty (Kutukai ,2018) -

- Data Sovereignty states that data is subject to the laws of the nation within which it is stored
- Indigenous Data Sovereignty states that data is subject to the laws of the nation from which it is collected (including Tribal nations)
- Māori Data Sovereignty refers to the inherent rights and interests that Māori have in relation to the collection, ownership, and application of Māori data.

Kukutai (2018) provides further direction, as detailed in Table 12.

Table 12. A Māori worldview of data.

Concept	Description
Control	Māori have an inherent right to exercise control over Māori data and Māori data ecosystems. This includes but is not limited to data creation, development, stewardship, analysis, dissemination, and infrastructure.
Jurisdiction	Decisions about the physical and virtual storage of Māori data should enhance control for current and future generations. Whenever possible, Māori data should be stored in Aotearoa New Zealand.
Self-determination	Māori have the right to data that is relevant and empowers sustainable self-determination and effective self-governance.
Stewardship	Māori data needs to be stored and transferred in such a way that it enables and reinforces the capacity of Māori to exercise kaitiakitanga over Māori data.
Restrictions	Māori should decide which Māori data sets should be controlled (tapu) or open (noa) access.
Ethics	Tikanga, kawa (protocols), and mātauranga Māori (knowledge) should underpin the protection, access, and use of Māori data.
Respect	The collection, use, and interpretation of data should uphold the intrinsic dignity of Māori individual, groups, and communities.

Concept	Description
Consent	Free, prior, and informed consent should underpin the collection and use of all data from or about Māori. Less defined types of consent must be balanced by stronger governance arrangements.

Information

Participatory processes are best at discovering information - encouraging tangata whenua to identify, record, and investigate their mahinga kai values.

Issues in data discovery:

- Tangata whenua will not be aware of all the information held by councils, and vice versa.
- Tangata whenua may not be familiar with the use of council public Geographical Information Systems (GIS) platforms and finding (and downloading) existing monitoring data.
- Council data platforms and data management systems are unlikely to be set up for collecting, capturing, storing, protecting, and using indigenous knowledge.
- Councils will have substantial non-indigenous science data, not always made publicly available, that tangata whenua may not be familiar with.
- Tangata whenua will have substantial indigenous knowledge that councils will not be familiar with.
- Provision must be made for pūrākau, whakataukī, etc., and supporting oral narratives to be considered as equally valid knowledge bases built on generations of lived 'in place' experience, that complement non-indigenous science methodologies.
- Tangata whenua may not be aware of how council data can contribute to their mātauranga Māori.

Data sharing is a great way for tangata whenua to engage with councils, and *vice versa*. In doing so, the benefits can flow back through to communities and tangata whenua over time.

Information sources include (among others):

- Karakia, waiata, whakataukī, pūrākau, mōteatea
- Art and architecture
- Taonga
- Oral histories, memories
- Written text incl.
    - Waitangi Tribunal evidence
    - Statutory acknowledgements
    - Iwi management plans
    - Cultural Impact Assessments
    - Cultural monitoring
    - Regional plans
    - Consent hearings

- Videos, tapes, and transcripts
- Maps
- Aerial photos, photographs, drawings, diagrams

Tangata whenua should determine how mātauranga Māori information is 'managed' at all steps. Issues to be considered include:

- Who collects the data?
- Who handles the data that is collected?
- Where does it sit / is it stored?
- How long is it stored for?
- Who has access to it, and for how long?
- Who updates and adds to it?
- How is it used?
- Who reports on it?
- How does access transfer inter-generationally?

Tangata whenua and councils should address data sovereignty upfront in the engagement process and work out what this will look like in practice. Facilitating the appropriate use of this information will be beneficial, so enabling activities by tangata whenua will be welcome by councils.

Tangata whenua can provide guidance on how to integrate sensitive knowledge into the process, explaining why this is important, and working out 'safeguards' that protect mātauranga Māori. It is recommended that tangata whenua and councils work through these protocols early in the process.

8 Monitoring

Introduction

Cultural monitoring (incl. mahinga kai) has generally not yet been integrated to any great extent into regulatory council monitoring. Part of this comes back to the time and effort required to deliver bespoke approaches that are resource intensive.

The NPS-FM 2020 requires that every regional council must establish methods for monitoring progress towards achieving target attributes states and environmental outcomes. The methods must include measures of mātauranga Māori and the health of indigenous flora and fauna. Monitoring methods must also recognise the importance of long-term trends, and the relationship between results and their contribution to evaluating progress towards achieving long-term visions and environmental outcomes for FMUs and parts of FMUs.

NPS-FM 2020 text

3.18 Monitoring

(1) Every regional council must establish methods for monitoring progress towards achieving target attributes states and environmental outcomes.

(2) The methods must include measures of:

a. mātauranga Māori; and
b. the health of indigenous flora and fauna.

(3) Monitoring methods must recognise the importance of long-term trends, and the relationship between results and their contribution to evaluating progress towards achieving long-term visions and environmental outcomes for FMUs and parts of FMUs.

Mahinga kai monitoring methods and programmes are best led by tangata whenua because mahinga kai environmental outcomes are about Māori and their relationships and connections with waterbodies. This is underscored by special monitoring provisions in the NPS-FM 2020 for mātauranga Māori, Māori freshwater values, and tangata whenua (see information box below). Collaborating with councils will be beneficial where synergies of monitoring align, particularly where councils have an obligation to meet the NPS-FM 2020 monitoring and reporting requirements.

NPS-FM 2020 text

3.4 Tangata Whenua involvement

(1) Every local authority must actively involve tangata whenua (to the extent they wish to be involved) in freshwater management (including decision-making processes), including in all the following:

d. developing and implementing mātauranga Māori and other monitoring.

3.8 Identifying FMUs and Special Sites and Features

(4) Monitoring sites for an FMU must be located at sites that are either or both of the following:

a. representative of the FMU or relevant part of the FMU
b. representative of one or more primary contact sites in the FMU.

(5) Monitoring sites relating to Māori freshwater values:

a. need not comply with subclause (4), but may instead reflect one or more Māori freshwater values; and
b. must be determined in collaboration with tangata whenua.

Key resources:

1). Mātauranga perspectives on monitoring

- Coordinated Monitoring of New Zealand Wetlands (Garth Harmsworth, 2002)
- Incorporating Mātauranga Māori into the Monitoring of Freshwater (Taranaki Regional Council, 2018)

Why undertake cultural monitoring?

Awatere & Harmsworth (2014) provide some context on the value of cultural monitoring:

> *Monitoring provides Māori with tools to articulate perceptions of environmental change, environmental health, and Māori well-being. It is important to develop monitoring programmes that provide a balance in cultural perspectives and take into account indigenous and science knowledge for different parts of the ecosystem or environment. This expanded knowledge base, which uses indigenous knowledge and values alongside scientific knowledge, can be complementary and requires a high level of discourse.*

Cultural monitoring is critical for implementing mahinga kai as a compulsory Māori freshwater value.

Cultural monitoring leads to action. If we monitor, then we can be kaitiaki.

Cultural monitoring/reporting can (Harmsworth & Awatere, 2012):

- Provide an indigenous knowledge/perspective on the environment
- Articulate cultural values & aspirations
- Identify trends/change from a Māori perspective
- Be collated/aggregated to report on the state of the environment (from a cultural perspective)
- Help contribute to responsibilities under kaitiakitanga, whakapapa, tino rangatiratanga, etc.
- Give responsibilities and importance of tangata whenua engaged in Resource Management (RMA 1991)
- Build tangata whenua capacity in Resource Management
- Feed into other SOE reporting (i.e., local, regional, national)

Cultural monitoring builds tangata whenua capacity, in both mātauranga Māori and non-indigenous science. Council participation in cultural monitoring also builds council capacity in non-indigenous science, as well as the opportunity to impart approaches that councils typically apply.

It is important that cultural monitoring is in a format preferred by tangata whenua. High quality te ao Māori tools and frameworks exist, which tangata whenua may consider for monitoring processes. Alternatively, tangata whenua may develop their own frameworks.

Tools can be used to bridge between the gap between non-indigenous science (and perspectives) and mātauranga Māori (and a te ao Māori worldview). This is best done by including desktop, wānanga and hui, and field-based mahi.

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 tools can be used to account for the state of the environment in time through a Māori lens and provide a vital reservoir of knowledge for all New Zealanders to improve their understanding of New Zealand's unique and fragile cultural and physical environment (Awatere & Harmsworth, 2014).

Key resource:

(1) MfE webinar:

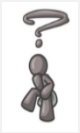
Webinar 7: NPS - monitoring and reporting requirements - YouTube

Components of a monitoring approach

What could a mahinga kai monitoring programme look like or include?

- Tangata whenua will identify what attributes to monitor, how, where, and when

- Tangata whenua decide whether mahinga kai monitoring can be done by council staff, tangata whenua, or both
- Mahinga kai attributes are measured both quantitatively and qualitatively, but most likely based on mātauranga Māori approaches or kaupapa Māori frameworks that 'measure' connections and relationships with freshwater – they link Māori and whānau wellbeing to freshwater health.



It is not about what is in the water, it is about how that affects tangata whenua.
Questions to consider asking:

- What do we need to monitor?
- How do we know if we're achieving our mahinga kai objectives?
- How do we measure human interactions with water?

- A mātauranga Māori / kaupapa Māori approach lends itself to producing holistic monitoring plans
- Compulsory NOF attributes will likely support aspects of mahinga kai, and could be used as information within more holistic mātauranga Māori attributes e.g., human health for recreation (E. coli)
- The above may require any inferred relationships to be established through a mātauranga Māori process, processes that affirm the voice of tangata whenua as instrumental to mahinga kai
- Laboratory techniques and experimental procedures may play a minor role, or only a supporting role
- Wānanga, hui, and kōrero will play a major role
- Monitoring locations will be in areas and locations that are significant for mahinga kai practices, and customs - rather than locations indicative of overall catchment health (although the latter could support mahinga kai environmental outcomes)
- Monitoring locations will be identified by tangata whenua
- Some monitoring locations may have to remain 'protected', which will require tangata whenua and council discussions on data sovereignty
- Monitoring will likely be based on rohe rather than FMUs and catchments
- Monitoring timing and frequency may be founded on the maramataka, which links to Māori culture, customs, and practices
- Monitoring will have a strong focus on supporting actions (e.g., restoration projects, riparian planting, tangata whenua projects, mahinga kai capacity building, GIS) – working backwards from environmental outcomes and objectives

Key resources:

Nga Tohu o te Taiao: Sustaining and Enhancing Wai Māori and Mahinga Kai – Operational Context (Waikato Regional Council, 2014)

The tools outlined in Section 0 (Existing tools) can also be used as monitoring frameworks.

Report cards

Information must be communicated effectively. This requires indigenous and non-indigenous means of communication, that are intuitive for everyone.

The use of report cards by councils is commonplace, as is the 'traffic lights' approach. Most of these do not integrate freshwater cultural aspects in any detail, as there may not be comparable methods of evaluation used for comparable purposes.

However, in some cases, bespoke report cards have been produced (such as the Waikato River Report Cards and Waitaki Report Card).

 **Key resources:**

1). Report cards: international and national examples

- Freshwater report card 2018 - Tāmaki (Auckland Council, 2018)
- Report Card 2021 - Healthy Land and Water (Healthy Land and Water, 2021)
- Annual Report Cards | Hawke's Bay Regional Council (reporting library, Hawke's Bay Regional Council)
- Waterways report card 2019 / Taranaki Regional Council (Taranaki Regional Council, 2019)
- Waikato River Authority: Report Card (versite.co.nz) / 2016 Pilot Waikato River Report Card: Methods and Technical Summary (NIWA, 2016)

2). These resources are described as report cards based on eco-cultural frameworks that explicitly link indicators that assess the state or condition of the catchment with the vision and goals articulated by iwi/hapū (see also:

- Tipa et al, 2017 - Using environmental report cards to monitor implementation of iwi plans and strategies, including restoration plans).
- Tipa et al (2017) discuss the value of environmental report cards and contend that they can be a valuable integrative tool to support restoration strategies, as well as a way of conveying monitoring results to increase understanding about the health and well-being of catchments.
- A number of te ao Māori framework tools can and have formed the basis for mahinga kai 'report cards', albeit generally not within council reporting.

9 Cultural mapping

Introduction

Cultural mapping has been recognized by UNESCO as a crucial tool and technique preserving the world's intangible and tangible cultural assets.

> Cultural mapping involves a community identifying and documenting local cultural resources. Through this research cultural elements are recorded – the tangibles … as well as the intangibles like memories, personal histories, attitudes, and values. After researching the elements that make a community unique, cultural mapping involves initiating a range of community activities or projects, to record, conserve and use these elements. …the most fundamental goal of cultural mapping is to help communities recognize, celebrate, and support cultural diversity for economic, social, and regional development, Clarke et al (1995).

Spatial information is integral to being able to implement mahinga kai in terms of the NPS-FM and NOF process. This is because it is place-based for tangata whenua and needs to relate to catchments within FMUs – and rohe(s). All regional councils / authorities have existing mapping systems and platforms. However, these are generally not set up to include indigenous information.

Cultural mapping encompasses a wide range of techniques and activities, from community-based participatory data collection and management to sophisticated mapping using GIS. Many of the approaches being adopted by tangata whenua are participatory and encourage tangata whenua to identify, record, and investigate cultural assets – both tangible and intangible (founded on te ao Māori worldviews).

Several good examples of mapping platforms exist, see (Auckland Council, n.d; Kā Huru Manu, n.d; Tasman District Council, 2019)[9] . These include dashboards, report cards, and other intuitive mapping tools.

Ngā Taonga Wai Māori webpage (Bay of Plenty)

The Kaupapa Māori team in the Essential Freshwater Policy Programme at Toi Moana Bay of Plenty Regional Council have created a dedicated page for tangata whenua to share their experiences, knowledge and understanding of their taonga wai Māori. This has been done as part of the mahi for Te Mana o te Wai under the National Policy Statement for Freshwater Management.

It comprises webpages for tangata whenua to share their experiences, knowledge and understanding and is one of a number of participation options under our Regional Māori engagement plan, Te Hononga.

More information is provided in the below link:

[9] The hapū and iwi of Tāmaki Makaurau

Waitaki — Cultural Mapping Project — Te Rūnanga o Ngāi Tahu

Richmond Catchment Management Plan CMP (Tasman District Council, 2019)

https://www.participate.boprc.govt.nz/freshwater-values-mapping-maori

Mauri Compass: state of mahinga kai mapping

The Mauri Compass is both a mauri assessment tool and a framework for restoring the mauri of any ocean, river or lake. The Mauri Compass consists of the following 12 attributes:

- Tangata whenua
- Tikanga
- Wairua
- Mahinga kai
- Habitat
- Biodiversity
- Bio-hazards
- Chem-hazards
- Taonga richness
- Taonga abundance
- Taonga health
- Catchment health

The state of mahinga kai is mapped according to 'Overall mahinga kai', 'Mahinga kai tikanga and mātauranga', 'Mahinga kai practice', 'Mahinga kai sentinel species overall', and 'Mahinga kai sentinel species'.

Mapping is web-based (Geographic Information System (GIS)) and designed to be intuitive. It differentiates between various components of mahinga kai, to enable monitoring of these elements separately and holistically. The mapping system is used to measure changes in cultural values over time.

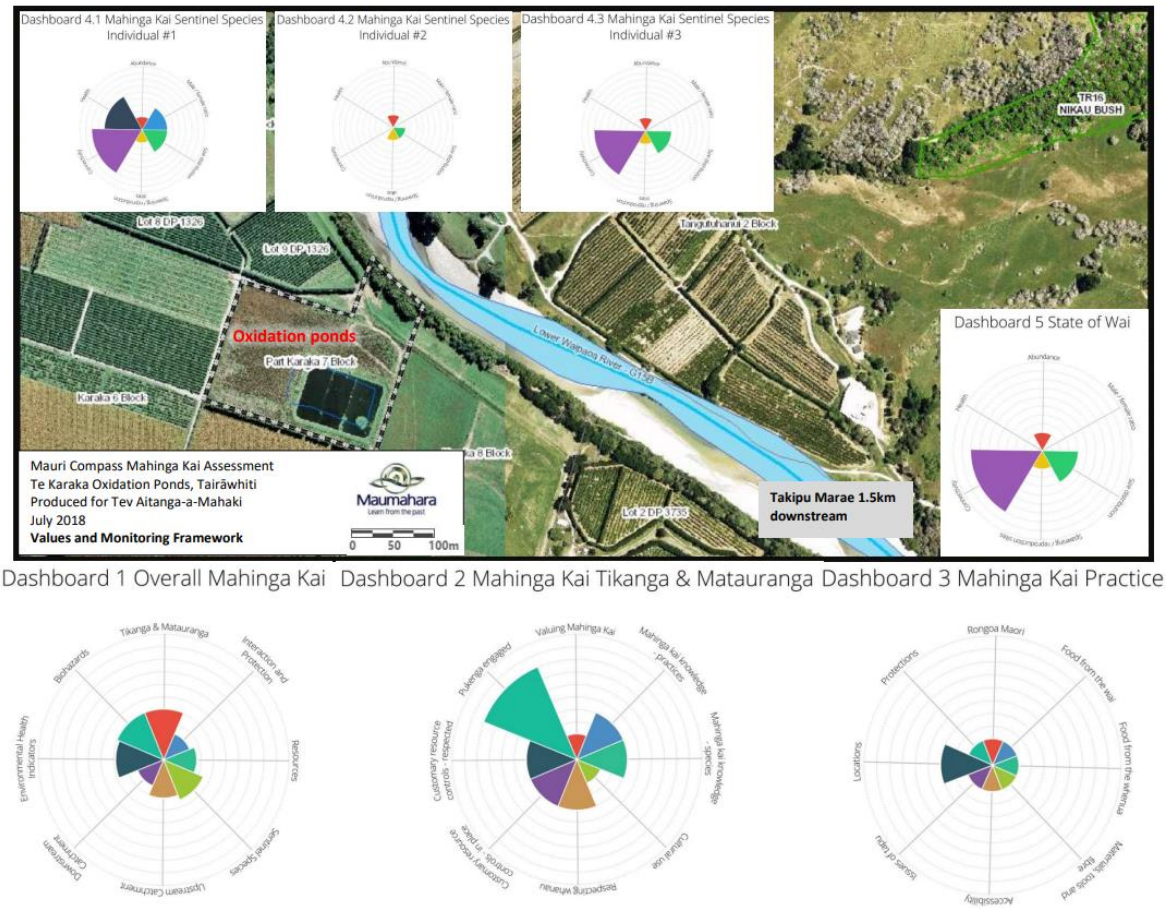


Figure 21.Display screen-shot of Mauri Compass dashboard

The Mauri Compass provides specifically for mahinga kai and integrates non-indigenous science with mātauranga Māori. An example is provided above, and further information can be found at https://www.mauricompass.com/applying-the-tool.html.

Te Arawa River Iwi Trust Takiwā webpage

Te Arawa River Iwi Trust represent the interests of the three Te Arawa River iwi located within the Upper Waikato River catchment area, namely Ngāti Tahu-Ngāti Whaoa, Ngāti Kearoa-Ngāti Tuarā, and Tuhourangi-Ngāti Wāhiao.

The trust has a web-based (Geographic Information System (GIS)) mapping system that provides for monitoring of water quality as well as mauri.

The mapping system is administered by iwi for tangata whenua, is intuitive, and is used to measure changes in cultural values over time. It also provides specifically for mahinga kai, and it integrates non-indigenous science with mātauranga Māori. It used the Mauri Model (Mauriometer) as the cultural assessment framework.

Waikato River Report Cards

This framework was guided by an advisory rōpu comprising representatives from five Waikato River Iwi. Waikato River Iwi cultural values and uses underpin the Report Card framework.

It is structured around 8 taura (strands of a rope) that together capture aspirations of the Vision and Strategy (Te Ture Whaimana) for restoration of the health and wellbeing of the river and its people. The report cards can measure changes in cultural values over time.

It also provides specifically for mahinga kai, and it integrates non-indigenous science with mātauranga Māori. More information is provided in the below link:

Waikato River Report Cards

Te Hoiere Catchment Enhancement Plan Story Map

In recognition of its intrinsic values and downward trends in the health of the catchment, the Te Hoiere / Pelorus Catchment Restoration Project was initiated with the aim of carrying out landscape scale restoration which sought to enhance and protect environmental wellbeing, but also provide social, cultural, and economic benefits.

The Te Hoiere community have deep connections, both past and present, with this landscape. The diversity of natural ecosystems ki uta ki tai (from mountains to sea) sustains their social and cultural wellbeing, and economic prosperity.

This plan is an ESRI ArcGIS Story Map – a website created from geospatial information, that enables the Te Hoiere Catchment Enhancement plan to be a living, interactive platform for all to see.

More information is provided in the below link:

Te Hoiere Catchment Enhancement Plan (arcgis.com)

Cultural Health Index mapping

The Cultural Health Index (CHI) is a national tool that measures factors of cultural importance to Māori in the freshwater environment. The CHI supports tangata whenua in capturing and recording the cultural health status of a waterway site based on local indigenous knowledge.

It provides an opportunity for water managers to incorporate Māori perspectives and values for stream health in management decisions. Three components make up the overall CHI score: site status, mahinga kai (customary food gathering) status, and cultural water quality.

This work was developed as part of the environmental reporting programme of Stats NZ and the Ministry for the Environment. Data was sourced from iwi and hapū.

It differentiates between cultural stream health and mahinga kai and provides a site status and overall status. The mapping system can be used to measure changes in cultural values over time. More information is provided in the below links:

Using the Cultural Health Index

Cultural health index for freshwater bodies | Stats NZ

COMAR - Cultural Opportunity Mapping

The Cultural Opportunity Mapping, Assessment and Response (COMAR) framework (Tipa & Associates promotes the use of 'participatory mapping' (including historical mapping) to help people see links, patterns, and inter-relationships quickly. COMAR provides for an integrative process to deliver the range of opportunities sought by whānau. The process:

- Uses a range of tools – including those developed by Māori for Māori.
- Uses as a baseline the historic state of the takiwā
- Bases iwi resource management on how much alteration is acceptable to iwi
- Identifies flow preferences
- Identifies restoration priorities
- Identifies the pressures we need to address
- Uses knowledge held within tangata whenua to shape attributes, measures, indicators

It includes mapping cultural association, opportunities, and concepts, and links through to the state of the takiwā, implementation, and monitoring. It integrates *inter alia* the Cultural Health Index and Cultural Flow Preference Assessment.

Te Mātāpuna II Māori engagement tool

Te Mātāpuna II is a Māori engagement tool developed by Auckland Council – A platform synchronized for all mātauranga Māori. Resource consents – CVA (cultural valuation assessment) is the first product hosted on this platform.

Te Kaunihera o Tāmaki Makaurau, Auckland Council is unique and partners with 19 mana whenua groups.

Te Mātāpuna II and Regulatory Services, CVA Review Project have collaborated with mana whenua to create a fundamental engagement tool. The data provided to mana whenua are all the resource consents lodged with Auckland Council in a more efficient manner, giving mana whenua the opportunity to register their interest earlier in the process.

Te Mātāpuna II, Resource Consents CVA, provides:

- 19 secure portals
- Resource consents applicable to each rohe lodged with Auckland Council in the last 7 days.
- Ability to select different layers including CHI
- Treaty settlement data (draft)
- Auckland Council Geomap layers
- Register and interest immediately
- Active participation

This engagement tool had not yet been deployed into production at the time this report was written.

Geographic Information Systems (GIS)

Introduction

GIS is recognising as an important component of managing geospatial data associated with mahinga kai. Mapping cultural sites or anything that may be considered 'cultural mapping' should be is in a format preferred by tangata whenua.

Printed or Digital Mapping

Participatory mapping is recommended. While mapping can be done on digital platforms, a participatory process can also involve participants drawing and annotating directly onto printed topographical maps. Provided printed maps have adequate landmarks these can be digitised and/or georeferenced if required or desired; or alternatively, 'participatory mapping' can be undertaken on a digital device. Consideration as to the IT literacy of participants and the ownership of the maps generated needs to be carefully considered and openly discussed.

If appropriate, digital mapping enables various options for data sharing and multiple 'views' for different users. Digital data can have validation (controlled entry from a dropdown list). Supporting background data sets can be added to printed or digital mapping. For example, rohe(s), important sites and places, mahinga kai areas, streams, topography, bush areas, and cultural heritage data sets.

Data Sensitivity

Spatial mapping of significant sites, wāhi tapū, and other mātauranga Māori attributes may require safeguarding, as determined by tangata whenua. The following mapping techniques are standard methods used to protect sensitive information, while still allowing them to be viewed in a spatial context (Armstrong et al, 1999).

Spatial Aggregation: Point locations are summarised by an aerial spatial unit, such as 'statistical area' or hydrological catchment boundaries. Thematic maps may be used to highlight the distribution and concentration of points of interest, without revealing their exact location. This technique generally offers the highest level of data **obfuscation** (the action of making something obscure, unclear, or unintelligible) and is well suited for mapping large spatial extents. However, features must be mapped as polygons which may not be suitable in all cases and individual/site specific information must be aggregated.

Point Aggregation: Points within close spatial proximity are combined to represent point clusters. Clustering can be achieved at varying levels of geographic scales to ensure a suitable level of obfuscation is achieved. This technique preserves the use of point symbology. However, the resulting number of mapped sites may not reflect the total number and individual/site specific information must be aggregated. It works best when sites are spatially clustered and is less suitable for spatially isolated points.

Random Perturbation: Points will be randomly displaced within a spatial bounding box. More advanced techniques may take advantage of 'donut geo-masking' which ensures points are displaced by a minimum distance but no more than a maximum distance. This technique preserves the number of points mapped and allows for the retention of individual/site specific information.

Scale Dependent Mapping: This is a technique used in interactive mapping to prevent the display of data beyond a defined spatial resolution or map scale. While it is an effective technique, it should be used in conjunction with the methods above to ensure that sensitive information is not accessed.

Data Hosting

Esri ArcGIS Online is a cloud-based Software-As-A-Service (SaaS) mapping and analysis solution and data hosting platform.[10]

Data is secured in the online environment and can be consumed by desktop or mobile devices. Access to the ArcGIS Online environment is secured by individual named user accounts. This allows data to be shared with specified individuals or groups via secured login. Alternatively, the data can be opened up to the wider general public with no login required. This makes ArcGIS Online a suitable hosting environment for data that will be viewed and edited by multiple users simultaneously.

In addition to hosting data, ArcGIS Online enables the ability to split data sources into multiple 'views', with each view having its own unique settings for accessibility, symbology, data attribution or spatial level of detail. As an example, a standard approach for hosting multiple views of the same dataset is outlined below:

- Master dataset
    - Data contains all suitable information. This may include the exact point locations and detailed attribution or include data that has been obfuscated in some way.
    - The master dataset is not visible to the public. Only authorised users or groups will have access to the data via password protected accounts.
    - Authorised users may have the option of creating, editing, or deleting data.
- Public data view
    - Data visible to the public may only be a subset of what is available in the master dataset. For example, only those features that have been 'approved for public view' will be available.
    - Data will be visible to anyone – no login is required to view the data.
    - Users may have the ability to create new data, however they will not be able to modify or delete existing data. Any newly submitted data will only be visible once it has been approved for public display by an authorised user.
    - Data may have reduced level of attribution. For example, all fields containing sensitive information can be removed.

ArcGIS Online and Open Data

ArcGIS Online is widely used throughout Aotearoa New Zealand by governmental departments, regional councils, and consultancies alike. This enables seamless sharing of data between organisation and groups if desirable.

Mapping sites of mahinga kai attributes / features and sharing through the ArcGIS Online platform would enable the data to be accessed and incorporated into maps created by others, allowing for

[10] (Esri ArcGIS Security, 2021, accessed 23 June 2021 via https://trust.arcgis.com/en/security/security-overview.html)

greater visibility and awareness of mātauranga Māori. Background datasets can easily be viewed alongside this information. For example, topography, land use, water bodies, water quality, etc.

10 Capability

Gaps

Several capability and knowledge gaps were identified in council surveys and wānanga with tangata whenua, as outlined in Table 13

Table 13. Capability and knowledge gaps identified through this project

Theme	Description	What is required / can be done?
The NOF process and the NPS-FM	• Currently little NPS-FM legal knowledge is in place across tangata whenua • Little information is available on what collaboration and engagement with tangata whenua could look like • Little information is available on how tangata whenua provisions in the NPS-FM, particularly mana whakahaere, will practically influence the decisions made by regional authorities	• Engagement training • Provide for both Crown and Māori 'ways of doing things' in the NOF process • Create and facilitate 'safe' processes for tangata whenua in council processes, and council kaimahi within tangata whenua engagement • Wānanga with council staff[11] • Training from the MfE • Training offered by councils[12] and practitioners working in the NPS-FM space • Training offered by practitioners of mātauranga Māori and tikanga • Wānanga with tangata whenua on key issues such as mana whakahaere and kaitiakitanga • Formal training opportunities • Forming collective understandings of what success looks like for all people in Aotearoa New Zealand, and each other's roles • Integrate mātauranga Māori into council processes, at all levels – from governance down to the operational level • Procure, employ, and train kaimahi to have the skills required to work within both worlds
Te Mana o te Wai	• The six principles of Te Mana o te Wai provide for all people in Aotearoa New Zealand to have a role in freshwater management • Individual and collective roles of tangata whenua, councils, industry, and the community as a whole – what does this look like practically?	
RMA, legal aspects, regulation Council and tangata whenua 'ways of doing things' – collaboration between 'two worlds'	• These are different to mātauranga Māori, tikanga, kawa, and a te ao Māori worldview • Applying these to Te Mana o te Wai and Māori freshwater values is challenging • Tangata whenua prefer to operate according to indigenous customs, protocols, and philosophies • Tangata whenua are generally not knowledgeable in these aspects • Councils' integration of the tangata whenua 'ways of doing things' into their mahi is not well-developed	

[11] A list of training opportunities is provided in the Appendices.

[12] Council have staff dedicated to implementing the NPS-FM, have in part attended related training, and are in a good position to share their knowledge with tangata whenua.

Theme	Description	What is required / can be done?
Understanding mahinga kai as a value, and its attributes	• This relates to all aspects of mahinga kai • It includes manaakitanga – the importance of reciprocity • While this knowledge is held by tangata whenua, the 'trick is accessing it' and protecting it where needed • This knowledge is 'stored' in different ways, from oral histories to details documented in treaty settlements • This will be specific to tangata whenua – 'one rule does not apply to all'	• Wānanga with mahinga kai / mātauranga Māori / tikanga experts • Opportunities can be identified for council Māori staff, who have extensive knowledge in these matters, to share their knowledge, and lead the discussion within their councils • Create the space for tikanga to be observed when having wānanga and hui with tangata whenua • Wānanga with tangata whenua from the area • Providing opportunities for tangata whenua to 'safely' record sensitive information • Oral histories need to be recorded and protected as required • Providing for opportunities for tangata whenua to share information that they want to share • Formal training opportunities, particularly in tikanga and practical aspects such as karakia, waiata, and pepeha • Education in the maramataka Māori and Matariki
Mahinga kai values held by specific tangata whenua	• Specific tangata whenua hold Mahinga kai values such as location of sites / important areas and the current state (baseline) of mahinga kai	
Mātauranga Māori Wai Māori Mauri Maramataka Matariki	• Mātauranga Māori knowledge exists, but we need to know how to source it, find it, engage practitioners, and enable knowledge transfer into councils where this is needed (being careful to protect sensitive knowledge). • The expertise of Māori knowledge sits with tangata whenua and council staff are generally not equipped with this knowledge. • Mātauranga Māori knowledge has been eroded through colonisation • Education is required that provides for reference back in history, pūrākau, whakapapa, etc. • Mātauranga Māori knowledge networks exist but aren't accessed • Knowledge is being lost on where and when to harvest	
Tikanga and te ao Māori worldview Māori culture and values Te Tiriti o Waitangi Wai Māori	• Tikanga, te Aa Māori worldviews, and Māori culture and values, are overall poorly reflected in councils • The transfer of knowledge held by tangata whenua • Te Tiriti o Waitangi (particularly in respect of water rights and interests)	

Theme	Description	What is required / can be done?
Te Reo Māori	• Te reo Māori is a taonga, and needs to be present for authentic tangata whenua collaboration • Te reo Māori capability varies across councils	• Integrate te reo Māori across council processes • Kaimahi fluent in te reo Māori • Formal training opportunities
Mahinga kai assessments Te ao Māori tools Mahinga kai and cultural monitoring Mahinga kai and cultural mapping	• Tools can be used to bridge between the gap between non-indigenous science (and perspectives) and mātauranga Māori (and a te ao Māori worldview). • This includes desktop, wānanga, hui, and field-based mahi • While te ao Māori framework tools exist (and cover assessment, monitoring, and mapping), these have not been widely implemented • While there are mahinga kai practitioners / consultants / specialists, these have not been commissioned by councils to undertake this mahi • Tangata whenua overall express concern over their ability to resource this work • Funding is an issue for both councils and tangata whenua	• Tangata whenua and/or councils can engage with mahinga kai practitioners / consultants / specialists • Kaumātua, kaitiaki and other knowledgeable whānau and whanaunga provide assessments • Examples of mahinga kai assessments, te ao Māori tools, monitoring, and mapping are provided in this kete
Data Data / information held in councils Data / information held by tangata whenua Sensitive information	• Data collection, storage, management, and sharing is not done in a way that protects mātauranga Māori, wāhi tapu, etc. • Lack of sharing of each other's information for each other's benefit • Need for inclusion of Mātauranga Māori data systems that ensure this data is not excluded from modelling processes.	• Sharing platforms for publicly available information • Providing access to council information for tangata whenua • Providing for tangata whenua to share knowledge with council • 'Safe' processes and protocols must be developed for sensitive information
Non-indigenous science / expertise	• Science approaches are focused on particular elements, and people need to see how this is brought together to indicate overall state. Examples of such approaches are: - Integrated modelling expertise - Laboratory work and analytical work related to e.g., chemical analyses - Indicator tools such as MCI, IBI, SHMAK, SEV, etc.	• Training offered by councils • Training offered by practitioners • Formal training opportunities • Learning on-the-job (partnering in projects)

Theme	Description	What is required / can be done?
	- Monitoring and sampling protocols related to the above - Geographical Information Systems - Software, IT, data sharing platforms, etc. - Freshwater 'accounting' systems - Measuring flows - Etc.	

Developing the right skills

Tangata whenua and council kaimahi need the skills and experience to effectively collaborate and participate in the process.

Councils and tangata whenua could assess their kaimahi knowledge and capability againstTable 13, to identify their gaps and areas for improvement. **Appendix 2** provides a list of training providers.

Tangata whenua and councils' entities may choose to provide training for their own staff, or for shared learning experiences – which may be preferable (for relationship building and learning from each other).

Links to existing audio-visual content, infographics, and fact sheets is provided in section 13 – these are great starting points for improving your knowledge and awareness.

Filling the capability and knowledge gaps requires adequate resourcing. This is discussed in Section 10.

Barriers to building capability

The following barriers were identified:

- Funding to pay for training
- Availability of training resources (e.g., computers)
- Inadequate recognition of the value of mātauranga Māori and tikanga Māori
- Low inclusion of Māori themes and topics in English-medium education
- 'Prior learning' requirements which block education pathways
- A lack of time for tangata whenua to commit to long term education such as university degrees
- Insufficient part-time, module or block course study options
- Few mentoring opportunities
- Other priorities

This aspect was not a focus of this project – the above therefore only reflects information captured during this project.

11 Capacity and Resourcing

Introduction

Implementing mahinga kai will require resourcing for both tangata whenua and councils.

- This will be work in addition to existing work in this space
- This is work that has historically not been resourced

Councils have historically not had sufficient resource to do this work. In-part this shortfall is because of competing requirements on councils. This is compounded by the fact that Central Government generally does not enter the 'operational' space, and tangata whenua are often already stretched beyond their current capacities (particularly where treaty settlements have not been finalised).

Resourcing is a significant issue for tangata whenua and councils across Aotearoa New Zealand.

What needs to be resourced?

Resourcing requirements include (but are not limited to) the below:

- training on the NPS-FM 2020 and NOF for tangata whenua
- mahinga kai education and awareness
- training for councils on tikanga and other te ao Māori aspects
- providing for mātauranga Māori in the process, enabling mana whakahaere
- engagement within Māori collectives
- engagement between iwi Māori collectives
- engagement between tangata whenua and councils:
    - developing relationships
    - enabling a collective understanding of each other's roles (tangata whenua and councils)
    - enabling wānanga on competing interests in catchments
    - co-design of engagement and project plans
    - undertaking fieldwork
    - supporting tangata whenua to lead the discussion on mahinga kai
    - enabling council to partner tangata whenua in this mahi
- progressing mahinga kai:
    - mahinga kai assessments in rohe(s)
    - undertaking research / projects to fill process, data, and knowledge gaps
    - understanding the current state (the baseline)
    - understanding the historical and desired state (data collection, desktop, fieldwork, wānanga)
    - developing values, environmental outcomes, objectives, and attributes
    - developing target attribute states and action plans
    - management of data accounting systems

  - integration into limit setting
  - developing monitoring programmes
  - long term implementation of monitoring programmes

- providing for mapping systems and platforms that support tangata whenua
- providing for data accounting systems that protect mātauranga Māori, while enabling effective storage, analysis, and reporting of data related to mahinga kai and associated values
- linking mahinga kai together with the other compulsory NOF values - ecosystem health, human contact, and threatened species
- reporting on mahinga kai
- enabling tangata whenua are at the table to lead mahinga kai into the future
- enabling tangata whenua to exercise kaitiakitanga on an ongoing basis, 'at the desk and in the field'
- delivering mahinga kai action plans.

An indication of kaimahi resources or budgets needed to implement the mahinga kai work is not provided as this is influenced by the size and complexity of catchments, the number of Māori collectives, the technical scope, and engagement approaches adopted.

We recommend tangata whenua and councils wānanga to quantify resourcing requirements.

Resourcing tangata whenua expert input

Within all of the above points is the question – *How can tangata whenua best input into that mahi?*

Authentic collaboration and partnership between tangata whenua and councils is critical. This requires working within both te ao Māori and Crown frameworks.

Tangata whenua and councils provided examples of what has been successful, including (but not limited to) are outlined below:

- **Tangata whenua-led council mahi**

Environment Canterbury (ECAN) Pou Mātai Kō (Cultural Land Management Advisors) approach is a good example of how staff resourcing can result in positive outcomes.

The establishment of water catchment groups led to the development of Pou Mātai Kō roles, enabling on-the-ground mahinga kai mahi, building rūnanga-led relationships with council, the community, and industry. ECAN learnt that there is a difference between planning and implementation, and in order to follow through from the planning phase capable hands are needed to carry the kaupapa out on the ground. The Pou Mātai Kō roles provide a bridge between mātauranga Māori (Māori knowledge and wisdom) and mainstream worldviews for land management. A fundamental element of success was that while these kaimahi are employed by ECAN, the establishment of Pou Mātai Kō positions was driven by rūnanga, with kaimahi appointments 'backed' by the rūnanga. Pou Mātai Kō are led by rūnanga who are constantly providing oversight and direction.

Through establishing strong relationships, there is confidence from all sides to ask questions and create change. Kaimahi have a strong background in mātauranga Māori and understanding of

tangata whenua mahinga kai aspirations. Dedicated full-time staff were needed. Training was provided.

A relevant job description for Pou Mātai Kō roles is provided in **Appendix 1**.

- **Technical advisory groups**

Gisborne District Council formed the KIWA group, a technical tangata whenua reference group mandated to work on projects that improve the mauri of the Turanganui-a-Kiwa bay and its waters. The group is focussed on technical matters, particularly mātauranga Māori (although non-indigenous science is also provided for). Representatives from all iwi and hapū in the catchment are invited onto the group, with these representatives selected by iwi and hapū leaders (for their mātauranga Māori knowledge). The group does not have a governance mandate, leaving that to iwi and hapū leaders. Representatives aim to reach consensus, with unresolved differences recorded. Representatives are paid for their time, and the group meets regularly.

Technical work is undertaken and led by members of the group, with support from the council. Work done by group members outside of the formal meetings is paid separately by contract. Council staff are also represented on the group in terms of administration support, facilitation, and technical input when appropriate. Facilitation is undertaken 'without agenda' and to promote robust 'no holds barred', 'warts and all' korero. Tikanga was observed in meetings.

An example of success through the KIWA Group is provided in:

Disposing of mortuary waste in Gisborne to be more in line with Tikanga Māori | Te Ao Māori News (Tumamao Harawira, 2021)
Gisborne's mortuary waste bylaw a first for Aotearoa | RNZ News. (Alice Angeloni, 2021)

Northland Regional Council (NRC) set up a Tangata Whenua Water Advisory Group of mana whenua technicians from Te Tai Tokerau to work with council. The members on the group do not represent iwi or hapū - they have been selected based on their personal expertise (members were selected through an iwi/hapū-mandated selection process based on technical skills). This group comprised multiple technical experts across a range of skills (including mātauranga Māori), which directly inputs into council planning processes. The group is focussed on technical matters and meets regularly. Representatives are paid for their time at meetings and work done by group members outside of the formal meetings is paid separately by contract. The NRC is not a 'member' of the group but does participate in its formal meetings and helps with administration. NRC have a separate working party Te Taitokerau Māori & Council (TTMAC) of iwi and hapū representatives who are mandated. Iwi leaders also appointed a separate Wai Māori Group to provide input from an iwi perspective.

Tasman District Council (TDC) established in partnership with iwi authorities an Iwi Working Group (IWG) consisting of a representative of each of the nine iwi of Te Tau Ihu in October 2017. A recent review of the IWG's partnership agreement has refocused the purpose of the IWG (renamed Tasman Environment Plan Partnership Working Group (TEPPWG)) primarily to the development of TDC's new environmental plan and input to plan changes for areas of interest on the current operative plan. Through the TEPPWG, Council will work with iwi authorities and their mandated entities to identify priority resource management issues and solutions. The TEPPWG provides a platform to solidify iwi partnerships with the Council, with a view towards planning for and making enduring decisions on freshwater especially matters that affect Te Mana o te Wai. Additional to the TEPPWG, a collaborative forum has been created with their iwi partners and neighbouring councils, Nelson City and Marlborough District. This collaboration aims to ensure they work strategically together across

Te Tau Ihu, to enable consistent and joined up freshwater planning and realise on-the-ground opportunities for protection and restoration of Te Tau Ihu waterways, lakes, and estuaries.

TD C also formed the Takaka Freshwater and Land Advisory Group (FLAG) - The National Policy Statement for Freshwater Management (NPS-FM) is a key driver behind the FLAG. This group has been successful at collaborating with the council to identify values and attributes. The members were all volunteers and not paid (except that iwi reps could seek reimbursement for their time, but often didn't). All members were there as individuals rather than as group representatives. Members were nominated (by themselves or others) and selection was based on their skills and experience. The council had one councillor as a member on the group. The group was supported by council staff (policy, administration, and science) and had an independent facilitator paid for by Council. Council also provided meeting venues, lunch/refreshments, and IT equipment. The group met regularly. Tikanga was observed in meetings.

A number of other councils also have technical advisory groups, while all supported the creation of such groups (and possibly advice 'hubs') for the benefit of tangata whenua and councils.

Technical advisory groups can also be set up independently by tangata whenua. For example, Mahaanui Kurataiao Limited (Home - Mahaanui Kurataiao Ltd) is a resource and environmental management advisory company established in 2007 by six local Rūnanga to assist and improve the recognition and protection of mana whenua values in their takiwā. While Mahaanui Kurataiao Limited supports the Rūnanga in achieving their objectives and aspirations for environmental management in their takiwā, it also provides environmental and cultural advisory and environmental planning to a range of local authorities, government agencies and private sector clients.

Another example of a technical advisory group set up independently by tangata whenua and mandated by iwi is Manawhenua Ki Mohua, which is an umbrella entity for three manawhenua iwi (Manawhenua Ki Mohua Office - Te Ātiawa o Te Waka-a-Māui (teatiawatrust.co.nz).

Some te ao Māori framework tools provide for expert panels or similar for technical tangata whenua input (e.g., Tipa & Severne, 2010). These are generally made up of subject matter experts from tangata whenua.

The above can be options for tangata whenua and councils to consider.

Key resource:

(1) Term of reference: Northern Wairoa example

Northern Wairoa freshwater improvement project partnership mana enhancing agreement

Feedback from tangata whenua and councils is that their technical and governance / representation input are best kept separate from each other. Technical working groups can then focus on the mātauranga Māori and other technical detail and avoid issues related to (i) grievances, (ii) disagreements between rohe(s) extents and rights and interests, and (iii) business interests - with tangata whenua independently participating on non-technical matters.

We have identified a number of key 'ingredients for success' which tangata whenua and councils can use when considering the best form of working group/engagement with tangata whenua in their rohe (Table 14).

Table 14. Success factors for working groups / engagement with tangata whenua

Tangata whenua are paid for their time and the work endures – it needs to be ongoing	*Mātauranga Māori is purposefully integrated, tangata whenua have input from planning to delivery*	*Keep technical and governance input separate*	*Employ tangata whenua 'backed' council kaimahi, that report to council and tangata whenua structures*
Tangata whenua undertake mātauranga Māori work, councils support with non-indigenous science	*Members on working groups are mandated / supported by tangata whenua leaders*	*Provide training to kaimahi to effectively navigate the interface between council and tangata whenua*	*Provide for an independent facilitator, and provide for a robust record-keeping process*
Follow local tikanga in meetings and other processes	*Getting the right mix of skills is key – including mātauranga Māori, non-indigenous science, and social/cultural*	*Ability to work collaboratively, in partnership, with a desire to seek consensus and entertain compromise*	*Creating a 'safe' space for robust discussion*

Who pays for this?

Adequate resources are needed in the short, medium, and long term. Mahinga kai is not a once-off project – it is ongoing, with a requirement to measure change over long time periods.

Some councils have funded this mahi through rates, with various councils including the below funding strategies within their Long-Term Plan budgets:

- dedicated full time mahinga kai council staff (e.g., Pou Mātai Kō, ECAN; see Appendix 1)
- NPS-FM tangata whenua engagement
- technical advisory groups
- budgets specifically dedicated to mahinga kai – from planning through to delivery of projects
- environmental, parks and reserves, and water utilities project budgets include line items for engaging tangata whenua, also specifically including mahinga kai

Most of the above are operational budgets, with some project work being capital work.

Councils and tangata whenua both need more resources, particularly staff / kaimahi to undertake this work.

Both tangata whenua and councils suggested that resourcing could also come from Central Government. Tangata whenua raised the possibility of Central Government funding within the context of addressing concerns over independency (e.g., to avoid conflicts of interest / pressure from council management if mahinga kai staff are paid by councils).

The relevance of treaty settlements to resourcing was raised. Tangata whenua considered that resources should be made available to all tangata whenua, not only for those without treaty settlement resources. Their view is that treaty settlement resources are compensation for past injustices and are not meant for funding work that councils are in any case legally obligated to undertake.

Funding possibilities

The lack of adequate funding was a common theme with all tangata whenua and councils, with funding options discussed. The following options / discussion threads were noted:

- This is a legal requirement and can be funded through rates – 'it should be a part of council business anyway'.
- Rates would fund mahinga kai if this was included in business-as-usual State of Environment reporting and monitoring.
- Mahinga kai could be included in regional plan rules and form a part of 'chargeable time' in resource consent processes.
- Council staff could be trained in mahinga kai, tikanga, mātauranga Māori, te reo Māori, and other relevant aspects, enabling them to integrate mahinga kai as business-as-usual in their mahi.

- Ideally, council staff could be employed based on existing relevant expertise and relationships with rūnanga etc. This could include secondments from tangata whenua.

There are significant challenges for Māori working in councils – it helps if the value of mātauranga Māori and tikanga is recognised within all levels of council as having the same standing as non-indigenous science / approaches, and Māori staff have the backing of local iwi, hapū, and whānau.

- Procurement processes for council-led projects could include mahinga kai in the evaluation criteria, with mahinga kai included in project scopes.
- Consenting, compliance, enforcement, and monitoring could then be cost-recoverable. This would include cultural impact assessments, which can be a great source of information.
- There are several external funding options within Central Government and other organisations that both tangata whenua and councils can apply for.
- Councils could assist with seeking funding for tangata whenua – it can be difficult for tangata whenua to do this when not adequately resourced and with little experience in putting together these applications. Furthermore, funding applications (even those targeting mātauranga Māori) are skewed towards non-indigenous science approaches (not catering for mātauranga Māori), which can make it difficult for tangata whenua.
- Councils' data platforms, including mapping, and equipment (such as water testing kits) can be shared with tangata whenua.
- The private sector could be engaged.

12 Recommendations: Integrating mahinga kai – ideas for councils

Councils and tangata whenua provided several practical suggestions for integration of mahinga kai. A common message was that mahinga kai should become business-as-usual for councils.

The below suggestions are in addition to information already covered in previous sections. There are many different 'levers' for mahinga kai. Some are provided below:

- Provide training for council kaimahi staff, or even better, shared learning experiences and opportunities that include tangata whenua.
- Include mahinga kai as its own item in Long Term Plan and Annual Plan processes.
- Mahinga kai is purposefully included in council strategic plans, including long term infrastructure planning, catchment management plans, structure plans, network discharge consents, and other consents – with tangata whenua partnering in relevant processes.
- In planning processes protect and enhance traditional and valued places (known and yet to be discovered) and refer to waterbodies with their correct te reo Māori names. Be pro-active in seeking this information out. Attending a local te reo Māori class is a great place to start.
- Ensure RMA planners are partnered with mātauranga Māori experts.
- Provide for tangata whenua physical access to mahinga kai areas in spatial plans, structure plans and plan rules such as riparian margins in greenfield development.
- Ensure all access possibilities are explored, including the 'Queens chain'. This linked document provides valuable information: Access along rivers, lakes and the coast (NZ Walking Access Commission Ara Hīkoi Aotearoa, 2021)
- Explore the option of mahinga kai covenants.
- Integrate regional plan rules for mahinga kai (take policies and objectives to a practical level). Mahinga kai should have its own consent requirements. For example, mahinga kai riparian buffers have different requirements than biodiversity and amenity buffers.
- Develop assessment criteria for mahinga kai for consent processes, and make sure consent terms take into account mahinga kai. For example, providing for the cultural harvest and long-term utilisation of natural resources.
- Review existing consents that have a significant impact on mahinga kai.
- Apply a mahinga kai lens to all water-related council work-streams, such as:
    - Management of urban waterways, rural waterways, and rural drains under council's control (and in maintenance plans).
    - Asset management e.g., consider 'daylighting' piped watercourses when stormwater infrastructure is up for renewals or upgrades.
    - Freshwater improvement projects.
- Include mahinga kai in environmental workstreams such as watercourse assessments and liaison on farm management plans.

- Employ in-house mātauranga Māori experts, performing a cross-council advisory function as is currently the case within non-indigenous science parts of councils e.g., inputting into policy, planning, and consenting, being specialist advisors from a technical mātauranga Māori perspective.
- Including treaty partnership Key Performance Indicators (KPIs) factored into performance reviews of council staff to grow wider accountability, and recognition that both councils and tangata whenua are responsible for "giving effect" to treaty principals.
- Provide for education and awareness on council websites and other community programmes. Support external organisations to integrate mahinga kai into their activities / business.
- Proactively look at water allocation through a 'mahinga kai lens'.
- Set up a platform to work with tangata whenua to investigate the use of mechanisms available under the RMA such as transfers or delegations of power under section 33 of the Act, joint management agreements under section 36B of the Act, and mana whakahono a rohe (iwi participation arrangements) under subpart 2 of Part 5 of the Act. The following link provides a useful reference for delegations: The Treaty, Tikanga Māori, Ecosystem-Based Management, Mainstream Law and Power Sharing for Environmental Integrity in Aotearoa New Zealand - Possible Ways Forward (Robert Joseph et al., 2019)
- Integrate mahinga kai into State of Environment monitoring, and through this process enable tangata whenua to undertake some or all the monitoring, particularly that related to cultural values.
- Find and engage with mātauranga Māori experts – create a database relevant to iwi, hapū, ahi kā, marae, and whānau.

13 Audio-visual, infographics, fact sheets

A number of resources are available for use by tangata whenua and councils.

This section categorises these according to:

- Audio-visual
- Infographics
- Fact sheets
- Other documents

It also provides key words to help guide the reader towards the tool of their choice.

Audio-visual

Links to audio-visual content are provided in Table 15.

Table 15. Links to audio-visual content, including key words and / or summaries

Title	Link (web / document download), and context description
MFE - Dec 2020: Te Mana o te Wai	Te Mana o te Wai: Introduction and overview The 6 Principles NPS-FM 2020 Council relationships with iwi and hapū
Te Mana o te Wai #3 Annette Sykes	Te Mana o Te Wai #3 The 6 principles Terminology and litigation concerns
Te Wai Māori - May 2020 Donna Flavell - Te Mana o te Wai	https://bit.ly/3FkliRP Iwi Chairs forum Freshwater Mauri Iwi rights Stakeholders RMA NPS-FM 2020 NOF
Newshub: The hui (Aug 2, 2021)	Donna Flavell - Te Mana o Te Wai "*Mihingarangi Forbes sits down with Emeritus Professor Michael Corballis, whose recent letter to The Listener claiming mātauranga Māori isn't a science*" Tina Ngata, Dr Rangi Mātaamua and Melanie Mark-Shadbolt discuss the application of mātauranga Māori to science.

Title	Link (web / document download), and context description
Te Wai Māori - He Reo Whakamana: Mini documentary series giving voice to tuna and their kainga	He Reo Whakamana Mahinga kai - tuna Mātauranga Māori Mauri Tikanga Māori Mana whenua Rangatiratanga Kaitiakitanga Water quality Threats Habitat loss Climate change
MFE: Restoring Ahuriri Lagoon	Restoring Ahuriri Lagoon Lagoon restoration Wetlands Mahinga kai
Sci. Science Learning Hub Pokapū Akoranga Pūtaiao along with Manaaki Whenua Landcare Research and MBIE's Unlocking Curious Minds initiative Repo – (wetlands) a context for learning	Repo (wetlands) – a context for learning Wetlands Mahinga kai Mātauranga Māori Cultural indicators Te Reo o te Repo: Voice of the Wetlands Activities Resources Links Videos and more
2012 ISEA Dr Huirangi Waikerepuru: Wai - Understanding Māori and indigenous concepts with water	Wai, Understanding Māori and Indigenous Concepts of Water Atua Mauri Mana, authority Significance of tikanga Law of tapu

Title	Link (web / document download), and context description
	Protection of water
Waka Huia Aug 2010 Part 1 of 3 A Māori traditional and political look at freshwater	Part 1 of 3 A Māori traditional and political look at fresh water Wai – ora Significance of wai ki Ngāi Māori. Kaitiakitanga Inseparable…I am the river; the river is me. Responsibilities handed down Land confiscations Water degradation
Waka Huia 2010 Part 2 of 3 A Māori traditional and political look at freshwater	Part 2 of 3 A Māori traditional and political look at fresh water Significance of wai ki Ngāi Māori Mahinga kai, baptisms, cleansing rituals. Settlements established on riverbanks Protect the mana of the wai Spiritual significance Importance of karakia Intergenerational transmission of mātauranga and tikanga Māori. Pākehā law and practices have worked against Māori. Mana whenua determined by whakapapa, yet DOC manages significant tohu whenua and Councils manage waterways. Aspects of tikanga getting lost Treaty of Waitangi settlements and rights to waterways.
Waka Huia 2010 Part 3 of 3 A Māori traditional and political look at freshwater	Part 3 of 3 A Māori traditional and political look at fresh water Kaitiakitanga 2 cultural lenses - conflicting views Poor practises - water degradation Impacts on mahinga kai Wellness of water impacts on well-being people. Rangatiratanga. Spiritual, physical connections to water Importance of food chain Eel migration. Fishing methods. Restoration aspirations
Māori Television. Sept 2021.	Beyond Matariki, Episode 1 Beyond Matariki, Episode 2

Title	Link (web / document download), and context description
Beyond Matariki Series:	Beyond Matariki, Episode 3 Beyond Matariki, Episode 4 In this series Professor Rangi Mataamua discusses the body of knowledge pertaining to Matariki. **Episode 1:** What is and when is Matariki? What are the activities that occur during this time? The spiritual significance of Matariki The social aspect of Matariki "the gatherer of people" The rising of stars that are connected to patterns and cycles of the environment. For example, dictating to Māori the right times to plant, harvest, hunt and fish and, as indicators of *tuna whakaheke* (eel migrations) and the time to refrain from interacting with the environment **Episode 2:** Mahuru, Whiringa-ā-nuku, Whiringa-ā-rangi: 4th, 5th and 6th months of the Māori year Takurua: Winter Kōanga: Spring The significance of the return of birds such as pīpīwharauroa and koekoeā Gardening a crucial aspect of traditional Māori society **Episode 3:** Raumati: Summer **Episode 4:** Ngāhuru: Autumn
Te Karere TVNZ (Aug 12, 2021) Taranaki iwi, hapū welcome funding for conservation and restoration projects	Taranaki iwi, hapū welcome funding for conservation and restoration projects Jobs for Nature scheme Manaakitia te taiao kia ora anō te mauri o te whenua Restoration Kaitiakitanga Intergenerational transmission of knowledge
Ōnuku Mahinga kai Series Wānanga 1	Ōnuku Mahinga Kai Series - Wānanga 1 Mahinga kai: Marine Kaitiakitanga Wānanga Intergenerational transmission of knowledge
Ōnuku Mahinga kai Series Wānanga 2	Ōnuku Mahinga Kai Series - Wānanga 2 Mahinga kai: Marine and FW Net-making

Title	Link (web / document download), and context description
	Significance of passing knowledge on to the younger generation. Whānau wānanga Kotahitanga
Ōnuku Mahinga kai Series Wānanga 3	Ōnuku Mahinga Kai Series - Wānanga 3 Mahinga kai - Te Waihora Kaitiakitanga Pātaka kai Connection with waterbodies Clear water doesn't necessarily equate to pure water. Diminishing stocks Upholding tikanga – manaakitanga
Ōnuku Mahinga kai Series Wānanga 4	Ōnuku Mahinga Kai Series - Wānanga 4 Mahinga kai – Wairewa Eel migration Harvesting eels Whanaungatanga Hononga Kotahitanga Intergenerational transmission of knowledge.
Protecting mahinga kai: Mananui Ramsden	Protecting Mahinga kai - Mananui Ramsden Environment Canterbury and Ngāi Tahu: Cultural Land Values Management Area – Te Waihora. Mahinga kai - the backbone of survival and dependant on sustainable practices. Land use consents and Farm environment plans should enhance and protect the environment, taonga species and the tikanga associated with these resources.
TedxChristchurch: A new vision of sustainability. 700 years old. Mananui Ramsden	Mananui Ramsden TedX Mahika Kai: an indigenous lifestyle…everyone had their role, and the mana of each individual was respected…the environment and our ancestors thrived. Nowadays a devastating impact on rivers, aquifers and oceans. Climate change, greenhouse gases. Look to the past to inform the future Environment Canterbury land use consents and farm environment plans.
Ngāi Tahu: Mahinga kai web series	Ngāi Tahu Mahinga Kai Range of Ngāi Tahu mahinga kai video clips including:

Title	Link (web / document download), and context description
	Kanakana, Pātiki, Pōhā, Mōkihi, Pāua, Tuna, Tī kōuka, Rongoā, Īnaka, Toheroa, Kōura, Tuaki. Based on the principles of Whanaungatanga, Manaakitanga, Tahungatanga, Kaitiakitanga, Tikanga, Rangatiratanga. Some of which are summarised in the table below.
Ngāi Tahu mahinga kai: Tuna	Tuna - Ngāi Tahu Mahinga Kai Mahinga kai: Tuna What does mahinga kai mean? Impact of deforestation on lakes. Lakes becoming more shallow, warmer, algae bloom. Climate change Extinction risk Assisting eels to migrate. Harvesting and processing of eels. Whakataukī that embodies the idea that if the eels are plentiful, you will hear the language and see the people: Ka hāhā te tuna ki te roto Ka hāhā te reo ki te kāika Ka hāhā te takata ki te whenua
Ngāi Tahu mahinga kai: Rongoā	Ngāi Tahu mahinga kai: Rongoā Mahinga kai: Rongoā Ngāti Kurī ki Kaikōura Ki uta ki tai. Ocean is related to forest, forest to ocean. Ngāi Māori also interconnected with the taiao…tuakana teina. Practices post colonisation have impacted on health and well-being of environment and people. Importance of retaining and passing on knowledge.
Ngāi Tahu: Tī kōuka	Ngāi Tahu: Tī kōuka Mahinga kai: Tī kōuka Maungatī: Mountain of Tī trees Highly prized resource to Ngāi Tahu. Traditional and contemporary harvesting and preparation of tī kōuka. Children taught skills of mahinga kai from a very young age.
Ngāi Tahu mahinga kai: Pātiki	Ngāi Tahu mahinga kai: Pātiki Mahinga kai: Te Waihora - Te Kete Ika A Rākaihautū. Was once a significant pātaka kai is now, one of the more polluted lakes in NZ. Ngāi Tahu have entered into an agreement with the Crown and Environment Canterbury for joint management of the lake and its

Title	Link (web / document download), and context description
	catchment area to better understand e.g., land use consents and their impacts on the lake. Restoration aspirations include maintaining the wetland area and allowing the lake to extend again. Important to bring the next generations back to re-connect with the lake and its resources.
Ngāi Tahu mahinga kai: Kanakana	https://www.youtube.com/watch?v=BUeyAYktiuQ&t=568s Mahinga kai: Kanakana Ngāi Tahu taonga species Anatomy of kanakana Ideal times for gathering kanakana Mahinga kai essential to the survival of the people. Mahinga kai binds you to who you are and where you come from. Customary practices including manaakitanga, kaitiakitanga. Intergenerational transmission Reconnecting with past and future generations Combining mātauranga Māori with western science Western science falls short in places, local knowledge from tangata whenua more appropriate. Declining abundance Responsibilities of kaitiakitanga to ensure things are there for the next generation. Life cycle involves moving from freshwater to sea, to freshwater.
Waka Huia (Nov 9, 2014) profiles David Kukutai Jones – Preserving traditional medicinal Māori practices	https://www.youtube.com/watch?v=96F3uCOlUmc&t=23s Mahinga kai: Rongoā Pūhā, Kōwhai, Kawakawa, Mutton bird fat, kūmara gardens Arrival of Pākehā establishment of learning institutions based on their frameworks of knowing. No better knowledge than that of the natural world. PhD focusing on how traditional Māori knowledge was preserved Tōhunga Suppression Act suppressed these practices
Ecological Restoration Koukourarata/Port Levy	https://www.youtube.com/watch?v=166Ihknau_0 Ecological restoration of Koukourarata/Port Levy with interviews from the local hapū.
Greater Wellington Regional Council: Mountains to Sea - Ki uta ki tai	https://www.youtube.com/watch?v=FXC1cpoCvVY Wellington Regional Council: Establishment of catchment committees to provide a local perspective on how to manage the environment focusing on land use and waterways that drain ito the sea.

Title	Link (web / document download), and context description
Healthy Waterways - working together to restore wetlands on farmland	https://www.youtube.com/watch?v=acRlCcgPmaw A partnership of farmers in the Wairarapa are working alongside Greater Wellington to restore the wetland areas in the Hapua farm. For more information on Greater Wellington's Healthy Waterways Programme visit: https://www.gw.govt.nz/healthy-waterways
Te Kura Huna - Ground water, the hidden treasure.	https://www.youtube.com/watch?v=RXQPKPUnesI This video incorporates Mātauranga Māori in an explanation of how groundwater and the hydrological cycle works from a local perspective. It explores ground and surface water monitoring and mechanisms, geothermal, planning, consents and our work with iwi Māori.
Dr Mahina-a-rangi Baker from Kāhui Wai Māori	https://www.youtube.com/playlist?list=PLcJ9Tc_Fo-NbexSC9Uhw6HriUTKG4X6RV Te Mana o te Wai is the fundamental concept of the Essential Freshwater regulations introduced by the NZ Government in 2020. Here, Dr Mahina-a-rangi Baker from Kāhui Wai Māori talks about how we are lifting the standards for caring for freshwater. Te Mana o te Wai means the first priority must be to ensure the life-supporting capacity of freshwater.
MfE (Dec 10, 2020) Te Mana o te Wai – mahinga kai	https://www.youtube.com/watch?v=G67AteblrPE&list=PLcJ9Tc_Fo-NbexSC9Uhw6HriUTKG4X6RV&index=3&t=33s Dr Mahina-a-rangi Baker from Kāhui Wai Māori talks about mahinga kai as a compulsory value within the National Objectives Framework. As a compulsory value mahinga kai means that iwi and hapū will now be required to define for them what does healthy mahinga kai look like including fish abundance, water quality and social aspects such as access. Transferral of knowledge within whānau and hapū. Mahinga kai as a compulsory value will inform decisions regarding limits on taking of water and discharges to water. Ideally it will be empowering for iwi and hapū in ensuring their role as kaitiaki is recognised. Effect will be given to Te Mana o te Wai by ensuring Māori are involved in monitoring and ensuring we get a more holistic picture in efforts to take care of water, people and the environment as an integrated whole. Kaitiakitanga. Manaakitanga.
Te Wai Māori (May 4, 2020) Rereata Makiha – Maramataka and the Science of Living By the Moob	https://www.youtube.com/watch?v=R4MTE7E3R_Q Rereata Makiha from Hokianga and Te Arawa shares his worldview and explains the connection Māori have with the environment. In particular he acknowledges the significance of pūrākau and whakapapa in explaining this connection. Moana-tū-i-te-repo and her role in the well-being of waterways. Mātauranga Māori to explain changes in water quality and water quantity.

Title	Link (web / document download), and context description
	Every iwi, hapū has their own unique mātauranga. Mauri…he mata ngaro te mauri. How can you restore something you can't see? Significance of kōtare as in indicator of the mauri of the waterways. Contrasting worldviews Interference with Papatūānuku destroys ecosystems. Whakapapa to waterways including aquifers. Water cycle and the changing of ua into wai. Western science academics view Māori concepts from a different cultural lens. Leave one to inform the other for looking for a way forward. Resilience: Toka anuanau, toka hiahia, rino hia. Te mana o te puna wai. Importance of retaining mātauranga Māori. Significance of the Maramataka Māori in restoration of waterways.
MfE Webinars on implementing the Essential Freshwater programme	https://environment.govt.nz/what-government-is-doing/areas-of-work/freshwater/e/freshwater-reform/webinars-on-implementing-the-essential-freshwater-programme/ Videos of webinars on implementing the new freshwater regulations.
Webinar 5: NPS-FM - vision setting and value identification	https://www.youtube.com/watch?v=zp4RQiTqzJg&t=2003s Vision setting and value identification.
Te Mana o te Wai. Dr Mahina-a-rangi Baker: mfe_mahina_master_h264	https://vimeo.com/333925321 Water sustains life Tuna
Sci. Science Learning Hub – Pokapū Akoranga Pūtaiao and Waikato Regional Council along with University of Waikato Ki uta, Ki tai	https://www.sciencelearn.org.nz/videos/1939-ki-uta-ki-tai Ki uta ki tai referring to the mountains to sea concept and a whole systems approach to sustainable water management. Catchments are really important for water quality and include activities related to water, soil and air. This link will provide you with useful articles, activities and videos on: Awa and iwi Learning about catchments Wetlands Ground water Surface water Wai Māori Te Mana o te Wai

Title	Link (web / document download), and context description
	Mahinga kai Kaitiakitanga Ika taketake – taonga species and more
Mahinga Kai: a beginner's guide	https://www.stuff.co.nz/the-press/news/94268979/Mahinga-kai-a-beginners-guide "*Mahinga kai is a natural resource and it's working the natural resource. It can be anything from the stones that you'd use for fire making and tools, pounamu, the mud you use for dyes and rongoā (medicine) and cooking in, as well as all your birds, fish. "Anything that is a natural resource from the environment is mahinga kai.*"
Young Ocean Explorers Webpage	https://www.youngoceanexplorers.com/yoe/video/8905476618 44#cplayer Short video clips and quizzes discussing a range of topics ranging from tikanga and whakataukī to Covid 19. Some aspects of tikanga discussed include kaitiakitanga, hongi, rāhui, and gathering flax.
Rauawaawa Kaumatua Charitable Trust: Tikanga - Tikanga Series of Videos	https://www.youtube.com/watch?v=2swxWiWp4aI https://www.youtube.com/watch?v=gclm6uQHxPU A series of videos on various aspects of tikanga including respecting the tikanga of the area you are in, pōwhiri, karanga, whaikōrero, the role of waiata and the placing of koha.
To survive we must measure our actions not by money, but Mauri | Kepa Morgan | TEDxWaiheke	https://www.youtube.com/watch?v=X_PddCFRwhA&t=136s Dr Kepa Morgan explains the meaning of mauri - the life-supporting capacity of an ecosystem.
Mauri meter evaluates Rena site	https://www.youtube.com/watch?v=fj2MgsX_3Ho The Mauri model, otherwise known as the 'Mauri meter' as used in the Rena disaster.
Ian Ruru - the Mauri Compass	https://www.youtube.com/watch?v=u1WJMDuY-98 Ian Ruru presents the Mauri Compass at the Te Wai Māori Eel Symposium.
He Tohu: Archives NZ and the National Library of New Zealand He Whenua Rangatira. A Māori Land	https://www.youtube.com/watch?v=8wozjqA3hUI "See the history of Māori arrivals from 1200, European arrivals from 1642 and the signing of He Whakaputanga from 1835 to 1839. This animation is from the map table at the He Tohu exhibition. The map table is a 3D canvas that stories are projected onto from above." Find out more at https://natlib.govt.nz/he-tohu"
He Tohu Moana Jackson interview (June 8, 2017)	https://www.youtube.com/watch?v=GDM-Ct21N4I Moana Jackson talking on The 'Declaration of Independence and The Treay of Waitangi "The Treaty to me has never been about Treaty rights, it's always been about the rightness that comes from people accepting their obligations to each other." Iwi and hapū are independent, retaining their own mana but, willing to seek inter-dependant relations with other political bodies including the Crown.

Title	Link (web / document download), and context description
	Mahi tūhono Important decisions were made at hapū level. Did Māori surrender their sovereignty in signing the Treaty? Observing the kawa of the marae/whenua and the role of authority to ensure that kawa is respected Will the Western world view and the Māori world view ever be on the same page? Taking the next step in the Treaty journey…How do we honour the Treaty relationship so that iwi and hapū can make iwi and hapū decisions and the Crown can make Crown decisions and then we find that common space of 'the marae' of which we can make joint decisions. Change is generational and conversational. The arc of history always curves towards what is just. Our people will never let it go…they will adapt and change but the hope will never go. It's about a promise made for two people to honour each other in a relationship of equality. Colonisation has denied that. Constitutional transformation is the political structural way in which that is addressed that comes from a change in the hearts.

Infographics

The following table provides links to relevant infographics (Table 16).

Table 16. Links to infographics, including key words and / or summaries

Title	Link (web / document download)	Keywords
Environment Aotearoa 2019	http://www.janegoodall.org.nz/environment-aotearoa-2019/	Climate change, Connection to Papatūānuku, ecosystems and biodiversity, freshwater and marine resources, pollution and use of land
Climate change implications for Aotearoa 2016	https://www.royalsociety.org.nz/what-we-do/our-expert-advice/all-expert-advice-papers/climate-change-implications-for-new-zealand/	Understanding key risks, climate change, flooding from rivers, ecosystems and biodiversity
Why Climate change maters	https://www.sciencelearn.org.nz/resources/2955-climate-connections-why-climate-change-matters	Climate change, mahinga kai, taonga species, mātauranga Māori, tikanga Māori

Fact sheets / guides

The following table provides links to fact sheets and other resources.

Table 17. Links to fact sheets and other useful resources.

Title	Link (web / document download)	Keywords
MFE Sept 2020 Fact sheets on policies and regulations in the Essential Freshwater package	https://environment.govt.nz/what-government-is-doing/areas-of-work/freshwater/e/freshwater-reform/factsheets-on-policies-and-regulations-in-the-essential-freshwater-package/	Te Mana o te Wai NPS-FM 2020 Mahinga kai, Wetlands, Avoiding loss of rivers, Values and attributes
MFE 2020: mahinga kai and other Māori freshwater values fact sheet	https://environment.govt.nz/publications/Mahinga-kai-and-other-maori-freshwater-values-factsheet/	Mahinga kai
MFE 2019: Environment Aotearoa: Te ao Māori	https://environment.govt.nz/te-ao-maori/	Creation stories, Mātauranga Māori, Māori rights and interests under Te Tiriti o Waitangi
MFE 2019: Environment Aotearoa: Mātauranga Māori and the Ministry	https://environment.govt.nz/te-ao-maori/matauranga-maori-and-the-ministry/	Treaty partnership and responsibilities, Customary practices within te taiao, Principles of te ao Māori NPS-FM2020 Te Mana o te Wai
MFE 2019: Environment Aotearoa: Ngā ture – Acts and Regulations	https://environment.govt.nz/acts-and-regulations/	Acts, national policy statements, national environmental standards
MFE 2019: Environment Aotearoa: Our ecosystems and biodiversity	https://environment.govt.nz/publications/environment-aotearoa-2019/theme-1-our-ecosystems-and-biodiversity/	Domain reports, ecosystems and biodiversity, environmental indicators,
MFE 2019: Environment Aotearoa: Making the Rotorua Lakes safer for all.	https://environment.govt.nz/what-you-can-do/stories/making-rotorua-te-arawa-lakes-safer-for-all/	Freshwater restoration example, biodiversity, native plants and animals
MFE 2021: Our Land 2021	https://environment.govt.nz/publications/our-land-2021/	Land and well-being, activities and effects on wider environment, climate change.
Essential Freshwater; Values and attributes fact sheet	https://environment.govt.nz/publications/essential-freshwater-values-and-attributes-factsheet/	High-level overview of values and attributes in the National Policy Statement

Title	Link (web / document download)	Keywords
		for Freshwater Management 2020
Environmental flows and levels factsheet	https://environment.govt.nz/assets/Publications/Files/FS23-Environmental-flows-and-levels-factsheet-final.pdf	Environmental flows Take limits Climate change
Flow guidelines for Instream Values - Volume A	https://environment.govt.nz/publications/flow-guidelines-for-instream-values-volume-a/	These guidelines provide a consistent approach to setting minimum flows and other flow requirements in rivers. Volume A covers the principles of hydrology and hydraulics, discusses various instream values, and sets out by the process by which flow requirements are determined and given practical effect. Volume B provides technical and background information.
Flow guidelines for instream values - Volume B	https://environment.govt.nz/publications/flow-guidelines-for-instream-values-volume-b/	These guidelines provide a consistent approach to setting minimum flows and other flow requirements in rivers. Volume A covers the principles of hydrology and hydraulics, discusses various instream values, and sets out by the process by which flow requirements are determined and given practical effect. Volume B provides technical and background information.
Evaluation of flow guidelines for instream values	https://environment.govt.nz/assets/Publications/Files/evaluation-of-low-flows-guidelines-jun01.pdf	This report seeks to evaluate the Flow Guidelines (Volume A & B) from the perspective of regional council staff involved in water allocation and identify means by which the Flow Guidelines could be improved to enhance their effectiveness.
Mahinga kai - what species interests you?	https://niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools/species	Information on aquatic animal mahinga kai species
Taonga Species Series	https://niwa.co.nz/te-kuwaha/tools-and-resources/taonga-species-series#:~:text=The%20Taonga%20Species%20Se	NIWA, through the MBIE-funded Cultural Keystone Species programme (2016-2020), have

Title	Link (web / document download)	Keywords
	ries%20includes,%3A%20kanae%2C%20tuangi%20and%20toheroa	developed a series of iwi engagement booklets sharing science knowledge to support species management strategy. The Taonga Species Series includes tuna, kākahi, kōura, piharau, inānga and pātiki. Coming soon: kanae, tuangi and toheroa.
Understanding Taonga Freshwater Fish Populations in Aotearoa-New Zealand	https://waimaori.maori.nz/wp-content/uploads/2019/05/Understanding-Taonga-Freshwater-Fish-Populations-in-Aotearoa-New-Zealand.pdf	To inform their forthcoming Strategic Plan, Te Wai Māori Trust have commissioned NIWA to provide them with an update of a report that was prepared for them in 2006, a Freshwater Fisheries in New Zealand Environmental Scan (Te Wai Māori 2006). Information collated: • Understanding the life cycle of each species. • Aotearoa-NZ distribution. • State and trends in the relative abundance of populations (if known). • Threat status, as determined by two methods: New Zealand Threat Classification System and the International Union for Conservation of Nature (IUCN). • What we know about pressures on freshwater taonga species populations. • Who has responsibilities for managing the fish/fishery.

Documents relevant to councils

Table 18 provides links to planning related and other documents relevant to council processes.

Table 18. Links to planning-related and other documents relevant to council processes

Title	Link (web / document download)	Keywords
Background to the development of mahinga kai and Māori use outcomes for the draft Natural Resources Plan for the Wellington Region	https://bit.ly/3DGUY2v	Developing narrative outcomes that relate to mahinga kai and Māori use values Objectives cascade Measurable indicators Numeric outcomes
Manawhenua Mātauranga Report for the Tākaka Catchments	https://www.epa.govt.nz/assets/FileAPI/proposal/NSP000042/Evidence-Supplementary-evidence/58d5c9e6a5/Supplementary-evidence-Matauranga-Report.pdf	This report has been contracted by the Tasman District Council to articulate the cultural significance of the Tākaka Catchments (within the Tākaka Freshwater Management Unit) and associated expectations for the management of ngā taonga (treasured resources), within the context of an integrated catchment management approach.
A cultural impact assessment Managing waterways in the Tasman District	https://www.epa.govt.nz/assets/FileAPI/proposal/NSP000042/Applicants-proposal-documents/5a03ed13ca/WCW-Appendix-06-01-cultural-impact-assessment.pdf	This cultural impact assessment (CIA) has been produced on behalf of Tiakina te Taiao to provide the Tasman District Council (TDC) with an appraisal of key effects of the proposed activities in the global river works resource consent on manawhenua iwi cultural values.
Regional plan provisions for discharges to land and water; Greater Wellington Regional Council	http://pnrp.gw.govt.nz/assets/Uploads/Chapter-5.2-and-5.3-Discharges-to-land-and-water-Appeal-v5-for-consent-order-13-October-2021.pdf	Inclusion of mahinga kai in rules and policies
Mahinga Kai in Wairarapa Moana and 5 principles for the Ruamāhanga Whaitua	www.gw.govt.nz/assets/Plans--Publications/Regional-Plan-Review/Whaitua/MahingaKaiinWairarapaMoana-RaSmith.pdf	The purpose of this paper is to show the importance of mahinga kai in Wairarapa Moana to Māori. This paper is split into 5 sections in line with the 5 principles of the

Title	Link (web / document download)	Keywords
		Ruamāhanga Whaitua. These sections look at the significance of mahinga kai in the Wairarapa Moana over time in general areas of discovery, past, current and future. The Resource Management Act (RMA) that regulates development with regard to environmental imperatives has also been taken into account, especially with respect to section 6 (e) and establishing a traditional connection.
Richmond Catchment Management Plan	https://tasman.govt.nz/my-council/key-documents/more/environment-reserves-and-open-space/urban-stormwater-strategy/richmond-catchment-management-plan/	Detail on long term aspirations, with intermediate objectives
Draft Nelson Plan Part 6, Freshwater Values	www.nelson.govt.nz/assets/Our-council/Downloads/Plans-strategies-policies/nelson-plan/draft-nelson-plan-sept-2020/part-6/98-Draft-Nelson-Plan-Part-6-LF-APP27-Freshwater-values-Public-engagement-October-2020.pdf	Integration of tangata whenua values
Implementing the National Policy Statement for Freshwater Management 2020, Bay of Plenty	https://infocouncil.boprc.govt.nz/Open/2020/08/RTAL_20200805_MAT_3321.htm	Presentation addresses key shifts for freshwater policy work, possible engagement options, the Kaupapa Māori workstream, and working together
Discussion paper reflecting tangata whenua values and interests on fresh water and freshwater ecosystems in the Rangitāiki, Kaituna-Pongakawa-Waitahanui water management areas; Bay of Plenty	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwivuMbro-nzAhUTT30KHUbODRkQFnoECAkQAQ&url=https%3A%2F%2Fatlas.boprc.govt.nz%2Fapi%2Fv1%2Fedms%2Fdocument%2FA3528249%2Fcontent&usg=AOvVaw39LfnAZ8KLStWgi72aXiFW	Toi Moana Bay of Plenty Regional Council is working to improve the management of freshwater through changes to the Bay of Plenty Regional Natural Resources Plan. This discussion paper informs the development of those plan changes. The document seeks feedback, to check that the information gathered to date about tangata whenua freshwater values and interests in the Rangitāiki and Kaituna-Pongakawa-Waitahanui water management areas (WMAs)

Title	Link (web / document download)	Keywords
		has been captured and understood correctly.
Te Hononga: the Regional Māori Engagement Plan for Implementing the NPSFM 2020; Bay of Plenty	https://atlas.boprc.govt.nz/api/v1/edms/document/A3586278/content	Te Hononga is the Māori relationships and engagement plan for the NPSFM and RNRP work programme. It is an action under He Korowai Mātauranga focussed on building relationships with Māori and provides a pathway to support the implementation of the NPSFM 2020. Te Hononga recognises that iwi and hapū across the region have different interests, different levels of readiness, and varying ranges of capacity and capability to participate in planning processes. In response, a flexible approach is proposed, in which various options for involvement are made available, individually or in combination.
Kawatiri Fresh Water Management Unit, West Coast Regional Council	https://www.wcrc.govt.nz/community/community-groups/fresh-water-management-groups/kawatiri-fresh-water-management-unit	An FMU community was established, for the purpose of identifying the values and issues of the community in the catchment around freshwater quality and quantity, and to make recommendations to the council about what future plan provisions and actions may be needed to manage land and water resources in the FMU.
Northland Tangata Whenua Freshwater Values – A Literature Review	https://www.nrc.govt.nz/media/plypolsf/northlandtangatawhenuafreshwatervaluesaliteraturereview.pdf	This literature review is the first stage of a project to identify and describe Taitokerau tangata whenua freshwater values, and to then develop frameworks for those values for use in implementation the National Policy Statement

Title	Link (web / document download)	Keywords
		for Freshwater Management (NPS-FW) and the National Objectives Framework (NOF) for the Northland Region.
Northland Tangata Whenua Freshwater Values – A Guide to decision-making	https://www.nrc.govt.nz/media/jb3fjfox/northlandtangatawhenuafreshwatervaluesaframeworktoguidedecisionmaking.pdf	The objective of this report is to inform decision-making by the council and community for freshwater management. or the values determined and represented in the framework, management responses in terms of indicator use and development, and in terms of regional planning provisions, are proposed. Identified management responses are discussed and proposals made for how they can assist in the ongoing engagement of tangata whenua in freshwater management. The framework can be used by the community and the Northland Regional Council (NRC) in developing freshwater management processes and provisions.
s3 Water Module, Operative Waikato Regional Plan	https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/Rules-and-regulation/WRP/Chapter-3-Water-Module-Operative-WRP-to-include-NPSFM.pdf	Regional plan in accordance with the NPS-FM. Integration of mauri into regional plan policies, objectives, and rules (in the water module).

Other documents

Table 19 provides links to fact sheets and other relevant resources.

Table 19. Links to fact sheets and other useful resources.

Title	Link (web / document download)	Keywords / description
A food gathering highway, Waitaki	https://www.kahurumanu.co.nz/ka-ara-tawhito/waitaki	Tawhito Kāika nohoaka (seasonal settlements) Kāika mahika kai (food-gathering sites)

Title	Link (web / document download)	Keywords / description
		Loss of access Prohibition of mahinga kai Knowledge
Mahika kai in our backyard – Nurturing our people and our environment	www.puketeraki.nz/site/puketeraki/Mahika%20kai%20in%20our%20backyard%20report%20final%2018%20July%202017.pdf	Mahika Kai strategy Direct runaka involvement environmental vision and strategy Strategic partnerships & relationships Traditional knowledge
10 Māori words every consultant or engineer should know	https://www.acenz.org.nz/10_m_ori_words_every_consultant_or_engineer_should_know	Te reo Māori Identity Embracing Te Reo Engineering Consulting
Mahinga Kai, Farmer's Hub	https://www.ecan.govt.nz/your-region/farmers-hub/fep/Mahinga-kai/	Natural resources Mana Manaakitanga Kaitiakitanga Frequently asked questions
River Restoration - from mountains to sea	https://www.learnz.org.nz/rivers201	River restoration
Story: Te tāhere manu – bird catching	https://teara.govt.nz/en/te-tahere-manu-bird-catching	Bird harvesting Food versus sport Spiritual aspects Traditional methods Maramataka
An Assessment of the Value and Feasibility of Mahinga Kai at UC	www.waterways.ac.nz/documents/Technical%20reports/WCFM%20TR%202013%20-%20005%20Mahinga%20Kai%20at%20UC.pdf	Feasibility of producing food in a way that strengthens mana whenua as kaitiaki Mātauranga Māori and scientific analysis Land-based mahinga kai Role of tikanga associated with marae and mahinga kai

Title	Link (web / document download)	Keywords / description
Stream Health Monitoring and Assessment Kit	https://niwa.co.nz/freshwater/management-tools/water-quality-tools/stream-health-monitoring-and-assessment-kit	NIWA's Stream Health Monitoring Assessment Kit (SHMAK) gives landowners, iwi, school and community groups simple, scientifically-sound tools and resources to monitor the ecological health of New Zealand's streams. If you would like to order a kit please download the order form and email it to instruments@niwa.co.nz.
Exploring Indigenous Understandings of River Dynamics and River Flows: A Case from New Zealand	https://www.tandfonline.com/doi/abs/10.1080/17524030802707818	Examples of the knowledge of streams and rivers held within Māori communities that could benefit contemporary resource management if it can be determined how cultural knowledge and practices and scientific approaches can be communicated and integrated
Whakarongotai o te moana Whakarongotai o te wa KAITIAKITANGA PLAN for TE ĀTIAWA KI WHAKARONGOTAI	https://teatiawakikapiti.co.nz/wp-content/uploads/2019/07/TAKW-Kaitiakitanga-Plan-V6-online-2.pdf	The purpose of this Kaitiakitanga Plan is to identify the key kaupapa, huanga and tikanga (values, objectives and policies) that guide kaitiakitanga as mana whenua. The plan may also be used to inform other entities of the values and policies of the iwi, and in particular, should provide more insight and detail regarding specific key concepts and values within the environmental statutory framework.
Wai Ngāi Tahu ki murihiku	https://waterandland.es.govt.nz/repository/libraries/id:1tkqd22dp17q9stkk8gh/hierarchy/Reports/Values%20and%20objectives/ngai-tahu-ki%20murihiku%20FINAL.pdf	The purpose of this report is to provide a foundation for resource management agencies and Papatipu Rūnanga planning for freshwater catchment values. It sets out, in broad terms, Te Rūnanga o Ngāi

Title	Link (web / document download)	Keywords / description
		Tahuki Murihiku values with respect to freshwater. It is a starting point for a continuing process of consultation that will further define: the specific priorities and needs of each Papatipu Rūnanga. The report also describes mahinga kai and taonga species for Ngāi Tahu.
The Cultural Health of the Opihi Catchment	The Cultural Health of the Opihi Catchment	The focus of this report is the Opihi catchment. This report seeks to bring together information about the Opihi and present it in a framework that increases understanding of the whole system, including natural processes, human needs and aspirations, and some of the cultural rights and interests of Manawhenua. The focus of this report is therefore the state of the Opihi River catchment today, and the management recommendations in response to the current state. The assessment of current state, must encompass a broad variety of terrain, climate, historic use, and flora and fauna – all of which underpin the cultural identity of Ngai Tahu whanui.

14 Kete elements combined

The kete consists of a number of elements.

These are brought together in one overall flow chart (Figure 22, Figure 23 & Figure 24) that includes suggestions on where tools may be used and concepts that are critical at various steps.

These are provided as options only. It is up to tangata whenua and councils to choose their methods and processes.

Important: Detail on each step of the overall flow chart is provided in previous sections of this document.

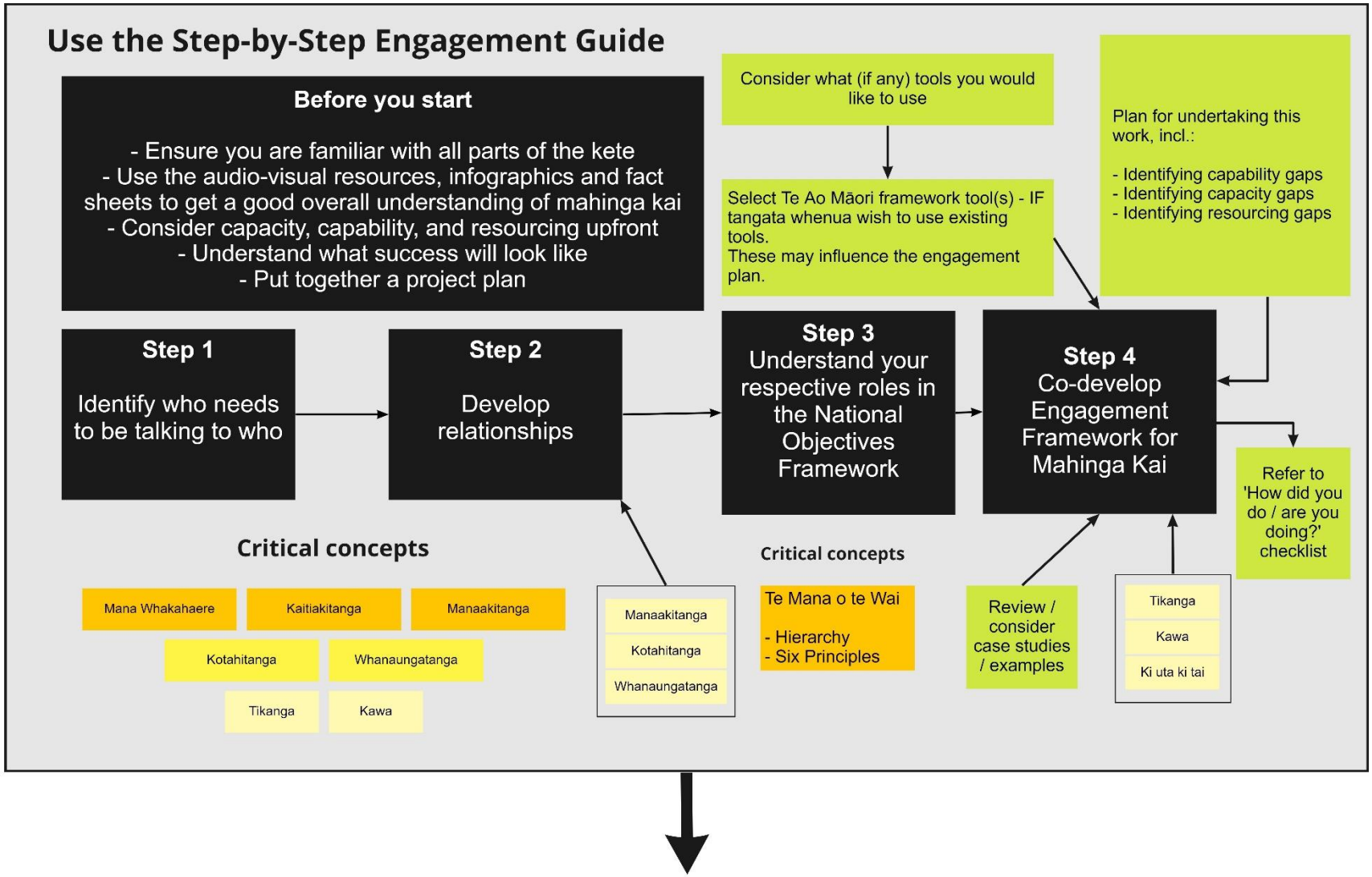


Figure 22. Step-by-Step Engagement Guide

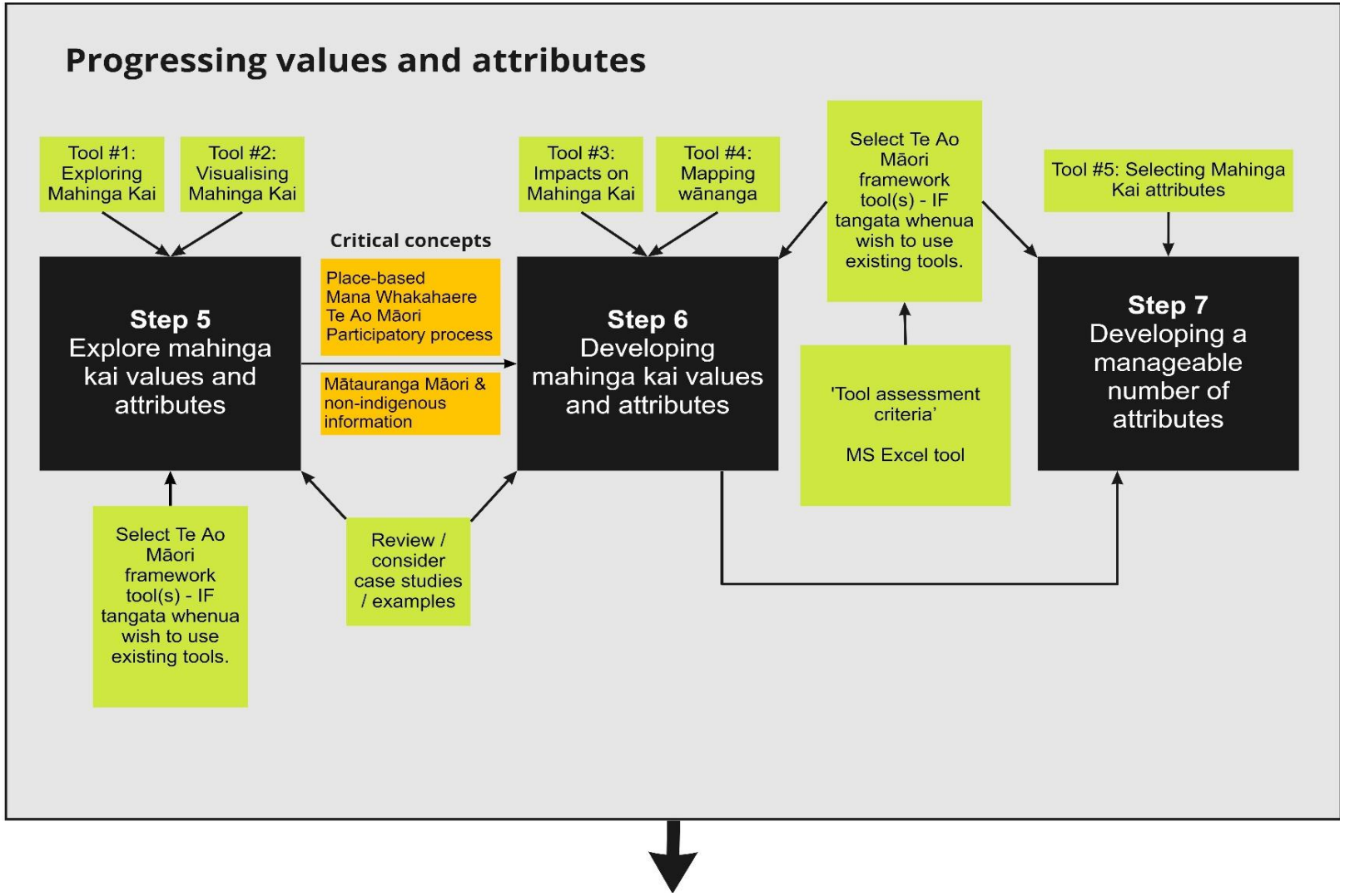


Figure 23. Progressing values and attributes

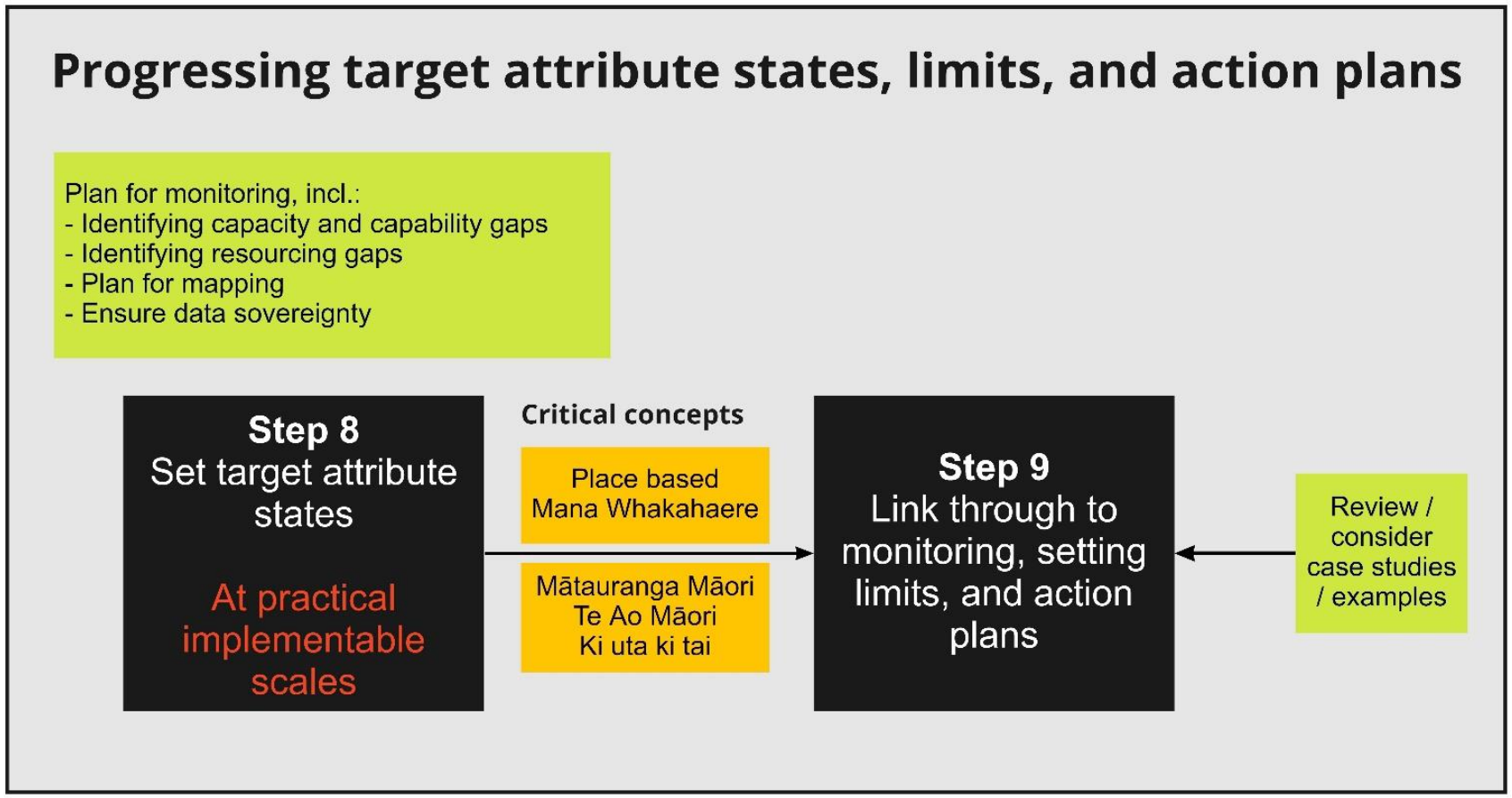


Figure 24. Progressing target attribute states, limits, and action plans

15 References

Armstrong, M.P., Rushton, G. and Zimmerman, D.L. (1999), Geographically masking health data to preserve confidentiality. Statist. Med., 18: 497-525. https://pubmed.ncbi.nlm.nih.gov/10209808/

Awatere S., and 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. Landcare Research. Prepared for University of Waikato. Web-link.

Awatere, S., Robb, M., Taura, Y., Reihana, K., Harmsworth, G., Te Maru, J., and Watene-Rawiri, W. (2017) Wai Ora Wai Māori – a kaupapa Māori assessment tool. POLICY BRIEF NO.19 (ISSN: 2357-1713) KAUPAPA MĀORI ASSESSMENT TOOL JUNE 2017 https://www.landcareresearch.co.nz/uploads/public/Publications/Policy-Briefing-Guidance-Papers/Policy-Brief-19-Wai-Ora-Wai-Maori.pdf

Baker, M. (2020). Summary of thesis findings: Te Kete Tua-ātea; Māori modelling of the future and the kaitiakitanga of water. Dr. Mahina-a-rangi Baker for Ātiawa ki Whakarongotai

Clark, Sutherland & Young (1995) Keynote speech. Cultural Mapping Symposium and Workshop, Australia.

Department of Conservation (2014) Guidance on Good Practice Biodiversity Offsetting in New Zealand. Guidance on biodiversity offsetting in New Zealand: Policies and plans (doc.govt.nz)

Hammond, V. (2018). New Zealand Freshwater Management A Public Health Perspective. In M. Joy (Ed.), Mountains to sea. Solving New Zealand's freshwater crises. Vol 71., pp 24-26 Bridget Williams Books

Harmsworth G., and Awatere S. (2012) Māori values – Iwi Perspectives of Freshwater Management. Landcare Research https://bit.ly/3BxdIAR

Hikuroa, D. (2017). Mātauranga Māori. The ūkaipō of knowledge in New Zealand. Journal of the Royal Society of New Zealand. Vol 47, 1, pp 5-10 https://bit.ly/3FBDd6Q

Kennedy, V., Cram, F., Paipa, K., Pipi, K., and Baker, M. (2015) Wairua and cultural values in evaluation. Evaluation Matters—He Take Tō Te Aromatawai 1: 2015 https://bit.ly/3DFJZq3 abstract only – pdf available for purchase

Kukutai, T. (2018) Data Summit '18 Informed decision-making through the ethical use of data. University of Waikato, Te Mana Raraunga. Data from a Māori worldview

Mana Whenua Mātauranga Report For the Tākaka Catchments. June 2018. Tasman District Council https://tasman.govt.nz/document/serve/Matauranga%20Report%20-%20June%202019.pdf?DocID=17628

Maniapoto Freshwater Cultural Assessment Framework, Maniapoto Māori Trust Board and NIWA, (2020). https://niwa.co.nz/te-kuwaha/research-projects/maniapoto-cultural-assessment-framework

Maseyk, F., Ussher, G., Kessels, G., Christensen, M., and Brow,n M. (2018) Biodiversity Offsetting under the Resource Management Act - A guidance document. Prepared for the Biodiversity Working Group on behalf of the BioManagers Group. Biodiversity Offsetting draft 1.7.indd (lgnz.co.nz)

Ministry for the Environment and Ministry for Primary Industries (2020). Essential Freshwater Wetlands Factsheet. Report no. INFO 968, Retrieved from https://environment.govt.nz/publications/essential-freshwater-te-mana-o-te-wai-factsheet/

Ruru I.H. and Kanz W.A. (2020) The Mauri Compass – a Mātauranga Māori Tool for Assessing the Mauri of Water. Version 02 https://www.mauricompass.com/applying-the-tool.html

Storey, R.G., Neale, M.W., Rowe, D.K., Collier, K.J., Hatton, C., Joy, M.K., Maxted, J. R., Moore, S., Parkyn, S.M., Phillips, N. and Quinn, J.M. (2011) Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams. Auckland Council Technical Report 2011/009. tr2011-009-stream-ecological-valuation.pdf (knowledgeauckland.org.nz)

Taura,, Y., van Schravendijk-Goodman,, C., & Clarkson, B. (2017). Ngā Whakamārama/glossary of Māori terms. In *Te reo o te repo = The voice of the wetland: connections, understandings and learnings for the restoration of our wetlands* (pp. 193-198). Hamilton: Manaaki Whenua – Landcare Research and Waikato Raupatu River Trust. Retrieved from https://www.landcareresearch.co.nz/uploads/public/Publications/Te-reo-o-te-repo/Te_Reo_o_Te_Repo_Voice_of_the_Wetland_complete_book.pdf

Te Aka Māori Dictionary. (2022). Retrieved 10 February 2022, from https://maoridictionary.co.nz/

Tipa, G.T. (2010) Consideration of a significance assessment method for tangata whenua river values. In: Hughey, K.F.G., and Baker M-A (2010). The River Values Assessment System: Volume 2: Application to cultural, production and environmental values. LEaP Report No.24B, Lincoln University, New Zealand. https://www.waikatoregion.govt.nz/assets/Leap-24B-The-River-Values-Assessment-System-Vol-2.pdf

Tipa, G.T., and Severne, C. (2010) Including Mātauranga Māori in Environmental Flow Setting Decisions. NIWA Client Report: HAM2020-030. NIWA Project: MfE10301. https://bit.ly/3FlVsgm

Tipa, G.T., Williams, E.K., Van Schravendijk-Goodman, C., Nelson, K., Dalton, W.R.K., Home, M., Williamson B., and Quinn J. (2017) Using environmental report cards to monitor implementation of iwi plans and strategies, including restoration plans, New Zealand Journal of Marine and Freshwater Research, 51:1, 21-43, DOI: 10.1080/00288330.2016.1268176 https://bit.ly/3FhuR45

Waitangi Tribunal. (2011). Ko Aotearoa tēnei. A report into claims concerning New Zealand law and policy affecting Māori culture and identity. Wellington: Waitangi Tribunal. https://bit.ly/3mSVXpC

Appendix 1 Pou Matai kō job description

Pou Mātai Kō – cultivating an understanding of mahinga kai

Project Summary

Environment Canterbury has appointed Pou Mātai Kō (Cultural Land Management Advisors) to help farmers understand and comply with new rules designed to protect mahinga kai: traditional Ngāi Tahu food resources and their ecosystems. Protecting mahinga kai is paramount to Ngāi Tahu and the establishment of these roles demonstrates Environment Canterbury's commitment to their relationship with their Treaty partner.

Over the last ten years Ngāi Tahu has worked with Environment Canterbury through the Canterbury Water Management Strategy (CWMS), to ensure mahinga kai is enshrined at a planning and policy level. Though this alone is significant, it is only useful if the community understands how to implement these values. The Pou Mātai Kō roles provide a bridge between mātauranga Māori (Māori knowledge and wisdom) and mainstream worldviews for land management. They are critical to ensuring that these values, upheld by Ngāi Tahu and the Regional Council, are understood and given practical effect by those that hold the key to positive mahinga kai outcomes: famers, land managers and the broader community.

Strategic Context

The Ngāi Tahu Claim of 1986 was presented in nine parts, (the Nine Tall Trees of Ngāi Tahu). Eight referred to land sales; the ninth was mahinga kai; an intrinsic part of Ngāi Tahu's identity. The Ngāi Tahu Claim was not just about loss of land, but also loss of mahinga kai resources, that the Crown has a duty to protect.

The purpose of the Pou Mātai Kō is to protect and enhance mahinga kai by bridging the gap between mātauranga Māori and mainstream worldviews for land management. Farmers are required to have Farm Environment Plans (FEPs) to get a land-use consent, and farms are audited to ensure compliance and accountability. FEPs include targets to protect mahinga kai, and our Pou Mātai Kō work with local farmers and industry groups to help them understand the importance of mahinga kai and how they can incorporate mahinga kai values in managing land. They empower landowners to make positive changes to the way they utilise land and water, to protect water quality and mahinga kai, and create greater awareness of historical Treaty grievances.

One of the main risks in establishing Pou Mātai Kō was hostility from the farming community, due to uncertainty about change and a loss of autonomy. Due to a lack of knowledge about Māori culture and values among private landowners and industry bodies, there were pockets of prejudice and resistance to change. For some profit-focussed industry bodies, it was going to require a paradigm shift, to encourage them to value sustainability and innovation. Another risk was that rūnanga were sceptical that Environment Canterbury could accurately represent their values through this role. They were concerned that we were promising more than we could deliver. Key mitigations included education and establishing strong and enduring relationships. Face-to-face communication with relevant audiences-built receptivity and created a safe space to speak openly. Internally, a considered effort to build staff knowledge and capacity within the teams to support these roles was crucial.

Ultimately the Pou Mātai Kō were about the implementation of the Treaty partnership. The roles support Environment Canterbury's strategic direction to provide meaningful outcomes for mana

whenua by leading and implementing the mahinga kai values that Ngāi Tahu fought for generations to be recognised.

Innovation

Environment Canterbury is not the first council to include cultural heritage values into their planning documents, however, it is the first council to appoint Pou Mātai Kō (Cultural Land Management Advisors) who can build rūnanga-led relationships and assist the community's land managers and farmers to understand how they can implement mātauranga Māori and mahinga kai values on farm, to be fit for audit.

In 2016 the Te Waihora Co-Governance Group was in place, and, under the Selwyn/Waihora Sub-regional Plan under the Canterbury Land and Water Plan, a Cultural Land Values Management Area (CLVMA) was established around Te Waihora/Lake Ellesmere, which meant that farmers within the area had to include mahinga kai targets in their Farm Environment Plans (FEPs). Te Waihora/Lake Ellesmere has huge significance for Ngāi Tahu historically as a place to gather food, but today it is seriously polluted, largely due to farming. The rūnanga saw a gap between the regulations and the outcomes on the whenua and the waterways, as the landowners didn't have the knowledge about how to protect Ngāi Tahu land values.

As a result of the positive outcomes for farmer-led initiatives, Environment Canterbury were able to achieve tangible gains for Ngāi Tahu mahinga kai values within private properties. Central Government added mahinga kai values into the new National Policy Statement for Freshwater Management, which has since built the foundation for how mahinga kai and mātauranga Māori can be achieved through FEPs.

A senior Environment Canterbury policy writer, Tami Woods, spent time with rūnanga at the marae, and together they saw an opportunity to bring their values alive. Without Ngāi Tahu representation at all levels, we were not going to see mahinga kai outcomes on the land and water. The rūnanga and Tami realised the need for dedicated full-time staff to bridge the gap.

Pou Mātai Kō were established in February 2017 and are the last link in the chain to ensure that Ngāi Tahu values are represented at all levels within Environment Canterbury from governance, to management, through to implementation. This role puts the relevant skills into our operational space.

The establishment of Pou Mātai Kō positions was driven by rūnanga, and these positions work with the Council, rūnanga, and the farming community. They highlight the importance of not only establishing relationships, but investing time into maintaining them. Pou Mātai Kō are an initiative led by the rūnanga facilitating engagement with farmers and the community, a shining example of building rapport and whanaungatanga across Environment Canterbury. There is a continual need across the organisation for establishing and sustaining an intimate connection with rūnanga.

Pou Mātai Kō are permanent roles, and only continue to grow as the business sees increasing value in them. FEPs with mahinga kai targets are a requirement, so the need for connection between farmers and rūnanga and cultural understanding is not lessening. Having started with one Pou Mātai Kō focusing on the Te Waihora area, two more roles have been established, each covering the Northern (Kaikōura, Hurunui and Waimakariri), Central (Christchurch West Melton, Banks Peninsular, Selwyn Te Waihora) and Southern (Ashburton, Orari Temuka Opihi Pareora, Lower Waitaki and Upper Waitaki) zones, with a more senior role with a regional focus recently established.

Project Success

Before Pou Mātai Kō were established there was a co-governance model between Ngāi Tahu and Environment Canterbury for Te Waihora, with a Cultural Land Values Management Area established, and Farm Environment Plans (FEPs) in place which included mahinga kai targets. However, rūnanga were concerned that despite being represented at both a governance and management level, they would not see outcomes aligned with mahinga kai values, because these values were not represented where they would need to be implemented, on farm. Farmers were concerned about the implications of mahinga kai values on their business/livelihood, the difficulties of the regulations, and limits to their autonomy.

At present, all 350 farms within the Cultural Land Values Management Area (CLVMA) have attained a land-use consent, consent to operate, developed a FEP that captures their current-state in terms of mahinga kai requirements, with clear and precise pathways for where they need to be, and, are on track to, or have already been, audited to ensure compliance. There is a stronger presence of rūnanga and Environment Canterbury within our farming communities, increased awareness of mahinga kai and how it's applicable to land-use and waterway protection.

This increase in awareness is evidenced by surveys we undertook through an independent external market research company, Research First, that gauged levels of comprehension and attitudes about mahinga kai within the farming community. Awareness of mahinga kai has increased from 39% to 69% within the Selwyn/Te Waihora catchment. The survey indicates that a large barrier was lack of knowledge, and that the education and relationships built by Pou Mātai Kō have eased that cultural barrier.

Further evidence of success is indicated by Synlait's Lead with Pride programme. Synlait, an industry group, has adopted mahinga kai land-use requirements within their own systems. Our approach to mahinga kai and mātauranga Māori has informed development of the National Policy Statement for Freshwater Management and its proposal to elevate mahinga kai values within planning frameworks.

Due to industry support and demand, the new regional role has been established in order to include broader engagement at both an industry and policy level, to provide strategic support for the three Pou Mātai Kō, and build capacity internally for different departments in terms of their obligations to Ngāi Tahu values.

The Pou Mātai Kō role is about respecting indigenous values. Bridging the gap between mainstream and indigenous views of land and water is not only crucial to farming communities across New Zealand, but anywhere that farming exists, nationally and internationally. We have set an example for addressing land and water quality issues in our rural communities in a way that supports and enhances indigenous rights.

Project Management

In order for us to help farmers implement Ngāi Tahu mahinga kai values and to have the trust of rūnanga, we needed to ensure this was rūnanga led and that we trained the right people to provide guidance. The original scope was clear as there was a specific goal, and a confined Cultural Land Values Management Area (CLVMA) in which to work. Our first Pou Mātai Kō, Mananui Ramsden, was hired because he has been entrenched in mātauranga Māori, understood Ngāi Tahu mahinga kai aspirations, and most importantly, had the backing of his whānau from Te Taumutu Rūnanga. He worked with affected landowners, industry groups, and rūnanga within that CLVMA. Challenges arose when others within Environment Canterbury saw the value in the role and skillset. Staff began to pull Mananui into different areas where he could add value, but we had to create boundaries and be clear that his role was to deliver for Te Taumutu Rūnanga.

Due to the success of our first Pou Mātai Kō, we felt confident to increase the scope, by increasing the resources. There was the need for more Pou Mātai Kō in Canterbury. We had the backing of our former Chief Executive, Bill Bayfield, to do this. Our current Chief Executive, Dr Stefanie Rixecker, also believes more growth is possible.

We prioritised bigger farms first, then moved to all landowners within the CLVMA. Landowners needed their Farm Environment Plans updated, and their consents and audits completed by a certain time. Our Pou Mātai Kō's work programme of engagement, upskilling farmers, and connecting with industry, flowed into that.

To ensure the success of the role, we worked to help Mananui develop strong relationships with the right people. We connected him with key internal staff to learn from and used existing internal relationships to connect him with the right people and community groups and industry bodies that we already had a strong relationship with. Knowing that there would likely be hostility from farmers to anyone in this role, we ensured that the person we appointed had the skills to connect with people easily.

Relationship Management

The focus of the Pou Mātai Kō has been to cultivate strong relationships across various stakeholders. In order to develop mātauranga Māori, in the right places, our Pou Mātai Kō are led by rūnanga who are constantly providing oversight and direction both directly to the Pou Matai Kō for their region, and through the multiple rūnanga forums that exist between manawhenua and the Regional Council: Te Waihora Co-governance; the Canterbury Water Management Strategy; Te Paiherenga, and Te Rōpū Tuia. The Pou Matai Kō then engaged with industry bodies, farmers, and others, tailoring the way they communicate the message of mana whenua to their different audiences.

Key to engagement with farmers has been on-farm 'Shed Talks' and attending community meetings. The Pou Mātai Kō have faced racism, hostility, and unwillingness to change from some farmers. However, by engaging in person, allowing the farmers to speak first, trying to understand their perspective, and genuinely following through, our Pou Mātai Kō have cultivated trust and safety in their relationships.

A successful way of engaging with industry bodies has been through noho marae experiences, coaching senior leaders on how to engage with rūnanga, and Te Tiriti o Waitangi workshops.

To communicate with the wider community, Mananui has been invited to share about his role on several different platforms. He was a speaker at TedX Christchurch in 2019, featured on TV (Fish of the Day and He Kākano), spoken on Radio NZ podcasts and at various national conferences including Synlait and FarmRight, and guest-lectured at Canterbury and Lincoln Universities for environmental students, setting up knowledge of cultural land values in youth.

Mananui presented at the DairyNZ Environmental Leaders Forum in December 2019 on mātauranga Māori and mahinga kai values. He addressed the fear there is surrounding the regulatory process nationally. Culverden dairy farmer, John Faulkner, told former Chief Executive, Bill Bayfield, "I can't emphasise enough the significance and impact Mananui had on the delegates. It was, in my estimation, one of those pivotal moments in influencing industry".

Appendix 2 Kaupapa Māori training providers[13]

Provider	Title	Level	Duration	Link	Key words
EIT Hawkes Bay Ruatoria - Tairāwhiti	Ka Hao te Rangatahi: Ecological Landcare	L 2 – 3	25 weeks full-time Ages 16-24 yrs.	https://www.eit.ac.nz/programmes/ka-hao-te-rangatahi-ecological-landcare/	Holistic ecological land management
EIT Hawkes Bay Tairāwhiti	NZ Certificate in Māori Traditional Food Production, Harvest and Management Mahinga Kai: Te Hoata	L 3	20 weeks full time. Part time options may be available	https://www.eit.ac.nz/programmes/mahinga-kai-te-hoata-kaupae-3/	Mahinga kai Mātauranga Māori. Maramataka Māori Māra kai Rongoa Kaitiakitanga
Tuhi Stationary	Maramataka On-line Course		Self paced course to do in your own time Resources, videos, quizzes and activities	https://tuhi.co.nz/products/maramataka-introduction-course-online	Introduction to the Lunar Cycle Maramataka Basics and Introduction

[13] Please note that the above list is not exhaustive or definitive since new programmes may be developed in any one year and, the above listed courses may be dependent on numbers, availability of tutors and any other constraints at that time.

It is recommended that you contact your local training providers if you are interested in a kaupapa. In addition, an internet search on the particular kaupapa, combined with wānanga, courses or training providers may provide additional learning opportunities.

Provider	Title	Level	Duration	Link	Key words
					Key phases of the Lunar Cycle
Te Pūkenga: Otago Polytech Kōkiri Centre	NZ Certificate in Māori Traditional Food Production, Harvest and Management Te Whakamahi Whenua.	L 3	20 weeks 30 hours per week	https://bit.ly/3v3gPhL	Mahinga kai Mātauranga Māori. Kaitiakitanga
Te Wānanga o Aotearoa Whirikoka Campus Gisborne	Certificate in Rongoa Māori	L4	38 weeks 1x 3 hour tutorial per week 1x Noho Marae a month (8x Noho Marae a year)	https://bit.ly/3atZcyf	Rongoa Māori Tikanga and mātauranga associated with rongoā.
Te Wānanga o Aotearoa Whirikoka Campus Gisborne	Te Kunenga o te Ao Tikanga Certificate		40 weeks 1x 3hour tutorial per week 1x Noho Marae a month (8x Noho Marae a year)	https://bit.ly/3BA5wA8	Introduction to tikanga and holistic healing through mātauranga Māori
Ringa Atawhai	NZ Certificate in Te Hiringa o te Taiao	L 4	Delivered over a 5 month period comprising of 4 noho marae (1 per month - 2 days duration).	https://bit.ly/3v3jsQy	Kaupapa Māori based environment studies

Provider	Title	Level	Duration	Link	Key words
			Up-front teaching will occur at marae base level. Tutors will be available to provide either group or one to one assistance.		
Te Wānanga o Aotearoa Whirikoka Campus Gisborne	Diploma in Rongoa Māori	L5	38 weeks 1x 3 hour tutorial per week 1x Noho Marae a month (8x Noho Marae a year)	https://bit.ly/30Xgf4c	Further your development and knowledge of rongoa Māori and its associated tikanga and kawa
Te Wānanga o Aotearoa Whirikoka Campus Gisborne	Te Hapūtanga o te Ao Tikanga Diploma		40 weeks 1x 3 hour tutorial per week 1x Noho Marae a month (8x Noho Marae a year)	https://bit.ly/3FIgojp	Mātauranga Māori. Learn about Mātauranga Mahaki through kawa and tikanga, history, karakia, waiata associated to Te Aitanga a Mahaki iwi.
Careers.govt.nz Contact provider for delivery options	NZ Diploma in Māori Environmental Management	L 6		https://www.careers.govt.nz/qualifications/view/2347/9999#contact-details	Restore, maintain and enhance the sustainability of the taiao. Mātauranga Māori.

Provider	Title	Level	Duration	Link	Key words
					Resource management
Te Wānanga o Raukawa Ōtaki Range of delivery options	Heke Kaitiakitanga Pūtaiao Diploma in Environmental Management	L 5	1 year 120 credits	https://www.wananga.com/diploma,portfolio,,5,Diploma-in-Environmental-Management.html	Kaupapa Māori based environment studies. Iwi and hapū studies. Te reo Māori
Te Wānanga o Raukawa Ōtaki Range of delivery options	Poutuarongo Kaitiakitanga Pūtaiao Bachelor in Environmental Management	L 7	3 years 360 credits	https://www.wananga.com/degrees-certificates,portfolio,,2,Bachelor+of+Environmental+Management.html	Kaupapa Māori based environmental planning and project management
Te Whare Wānanga o Awanuiārangi Available nationally	Wai ora		L 3 18 weeks full-time Part-time options available	https://www.wananga.ac.nz/study/certificates/wai-ora-level-3/	Sustainable practices of coastal and freshwater bodies based on mātauranga Māori
Te Whare Wānanga o Awanuiārangi	Wai ora		L 4 18 weeks full-time Part-time options available	https://www.wananga.ac.nz/study/certificates/wai-ora-level-4/	Sustainable practices of coastal and freshwater bodies based on mātauranga Māori

Provider	Title	Level	Duration	Link	Key words
Available nationally					
Te Whare Wānanga o Awanuiārangi Whakatane or marae based on demand Available nationally	Pūtake Taiao Certificate in Environmental Sustainability		L 4 42 weeks Mon-Thurs and SDL	https://www.wananga.ac.nz/study/certificates/putake-taiao/	Environmental management Maramataka Māori Te ao Māori and sustainable living
Te Whare Wānanga o Awanuiārangi Available nationally	Te Aka Pūtaiao Certificate in Environmental Studies		L 5 20 weeks	https://www.wananga.ac.nz/study/certificates/te-aka-putaiao/	Promote the development and validity of mātauranga Māori in the environmental field
Te Whare Wānanga o Awanuiārangi Whakatane. Range of delivery options	Te Aho Pūtaiao Bachelor of Environmental Studies	L 7	3 years	https://www.wananga.ac.nz/study/degrees/bachelor-of-environmental-studies/	Kaupapa Māori based environmental studies.

Appendix 3 Tool assessment criteria

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
Tool info	1	The tool is not available in hard copy or digitally	Tools need to be accessible for use	While accessible, some tools have copyright and are considered Intellectual Property (IP); this needs to be noted where applicable
		The tool is available in hard copy		
		The tool is available digitally		
	2	Tool requires training / specialised skills	Will determine uptake of tool	N/A
		Tool does not require training		
	3	Training programmes are set up	Will determine uptake of tool	N/A
		Training programmes are not set up		
	4	Tool provides outputs that are automatically mapped through the process	Provides indication of application / ease of use	
		Tool provides outputs that can easily be mapped		
		Tool provides outputs that cannot easily be mapped / are not mapped		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Results are provided as text		
		Results are provided as graphics / intuitive media		
	5	The tool does not provide a step-by-step process for use which makes it difficult to follow		
		Moderately easy to follow		
		The tool provides a step-by-step process for use, which makes it easy to follow		
Technical NPSFM	6	The tool <u>does not</u> specifically address **freshwater**	This is key to understanding the tools direct application to the NPSFM	**NPSFM** 1.5 Application (1) This National Policy Statement applies to all freshwater (including groundwater) and, to the extent they are affected by freshwater, to
		The tool <u>broadly</u> addresses **water**		
		The tool <u>specifically</u> addresses **freshwater**		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
	7	The tool cannot be used for **estuaries**	This is key to understanding the tools direct application to the NPSFM	receiving environments (which may include estuaries and the wider coastal marine area) 3.5 Integrated Management (1) Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must: a. recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; b. recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and c. manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects,
		The tool broadly addresses **water**		
		The tool can be used for **estuaries**		
	8	The tool does not cater for freshwater **catchment** processes / issues	This is key to understanding the tools	

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		The tool in-part caters for freshwater **catchment** processes / issues	direct application to the NPSFM	on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.
		The tool caters for freshwater **catchment** processes / issues		
NOF process	9	The tool is not specifically designed for mahinga kai **values or attributes**	This is key to understanding the tools direct application to the NPSFM	N/A
		An output of the tool is mahinga kai **values.** The tool intrinsically incorporates mahinga kai **values**. E.g. Mahinga kai is included in the tool, but as a minor component		
		An output of the tool is mahinga kai **attributes - for identified values.**		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
	10	The tool does not intrinsically result in project-level **actions / tasks** for improving mahinga kai values.	This is key to understanding the tools direct application to the NPSFM	Project-level' is included as this relates to implementing, rather than planning and setting high level objectives.
		An output of the tool is mahinga kai **actions / tasks**.		
		An output of the tool is mahinga kai **actions / tasks**, including specifically **monitoring plans.**		
	11	The tool does not intrinsically provide for **measurement of change over time**	The NPSFM requires that freshwater values are reported on over time, with change quantified (e.g. positive change as improvements are implemented), enabling monitoring and reporting. A robust and repeatable way of quantifying / scoring mahinga kai attributes is required for transparent and accurate	This is necessary in order to evaluate the success or otherwise of action plans.
		The tool can be used for **measurement of change over time**, but a repeatable and robust process for re-assessment is not documented (with checks and balances)		
		The tool provides for **measurement of change over time**, with a repeatable and robust process for re-assessment		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		documented (with checks and balances)	measurement of change over time.	
Mana whakahaere, kaitiakitanga, rangatiratanga, and mātauranga Māori	12	Does not detail a process that provides for tangata whenua to **decide** for themselves, does not provide for a **tangata whenua-led process**	Successful implementation of the NPSFM mahinga kai provisions, in its best form comprising agreement between councils and tangata whenua on mahinga kai values, objectives, and attributes, will require a collaborative process between councils and tangata whenua. That process will need to recognise the six principles of Te Mana o Te Wai. It will also need to comply with *3.4 Tangata Whenua Involvement* in the NPSFM.	NPSFM definitions: Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater Kaitiakitanga: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations Adapted from https://maoridictionary.co.nz/
		Details to some extent a process that provides for tangata whenua to **decide** for themselves, partially provides for a **tangata whenua-led process**		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Details a process that provides for tangata whenua to **decide** for themselves, <u>provides</u> for a **tangata whenua-led process**	The above will effectively set the scene for councils and tangata whenua to work together, recognising their respective roles. Tools that facilitate effective collaboration between councils and tangata whenua will be beneficial to the process, also in terms of achieving the December 2024 timeframe.	<u>Rangatiratanga</u>: Right to exercise authority, self-determination, self-management
	13	<u>Does not provide</u> specific guidance to enable council and tangata whenua **collaboration** (engagement)		Issues to consider: Does it outline steps for tangata whenua and councils to engage? Does it provide for a pathway to agreed engagement? Does it bring together tauiwi, non-Māori and Māori engagement protocols? Does it bring together tauiwi, non-
		Provides to <u>some extent</u> specific guidance to enable council and tangata whenua **collaboration** (engagement)		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Provides to a <u>significant extent</u> specific guidance to enable council and tangata whenua **collaboration** (engagement)		Māori and Māori ways of collecting and sharing data?
	14	<u>Does not specifically provide</u> for a **mātauranga Māori approach** to mahinga kai, to complement Non-Indigenous Science approaches <u>Does not specifically provide</u> for **indigenous knowledge** and **non-quantitative** data	A mātauranga Māori approach is crucial to collaborating with tangata whenua. This approach is also necessary in order to obtain the knowledge (data) required for mahinga kai. The mātauranga Māori approach will lead to semi-quantitative and narrative attributes, as well as quantitative - with Indigenous Science attributes equitably	Understanding by looking back, and discovering through korero, hui, and wānanga. This will include inter alia historical accounts (records), local knowledge (records), recorded oral history (e.g. waiata, karakia), and indigenous knowledge related to water bodies and te taiao. Mahinga kai can comprise quantitative, semi-quantitative and qualitative (narrative attributes).
		<u>Partially provides</u> for a **mātauranga Māori approach** to mahinga kai, to complement Non-Indigenous Science approaches <u>Partially provides</u> for **indigenous knowledge** and **non-quantitative** data		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Specifically provides for a **mātauranga Māori approach** to mahinga kai, to complement Non-Indigenous Science approaches Specifically provides for **indigenous knowledge** and **non-quantitative** data	considered. It is not always possible (or desirable) to measure by Non-Indigenous Science means mahinga kai aspects such as connections, whakapapa, and relationships to waterbodies,	
Relevance to Mahinga Kai The NPSFM provides direction on mahinga kai. This is well-explained in: https://www.stuff.co.nz/the-press/news/94268979/mahinga-kai-a-beginners-guide https://www.youtube.c	15	Provides a **framework** that can be used to assess mahinga kai i.e. mahinga kai is not a standard outcome of using the tool	More focussed tools / frameworks may have the benefit of simpler and faster processes, provided tangata are still able to exercise mana whakahaere	N/A
		Specifically assesses mahinga kai i.e. mahinga kai is a standard outcome of using the tool		
	17	Does not include specific detail on **potential mahinga kai resources**	It is very important that through the NOF process, and in considering mahinga kai, that the Te Ao Māori view of mahinga kai is followed, and this requires a holistic view of	Includes: Food (plant and animal), rongoa, tools, and other resources such as fibre for raranga, bark, stones for hangi, pounamu, mud dyes, etc. Includes whenua resources
		Includes specific detail on **potential mahinga kai resources**, covering some mahinga kai resources as envisaged in the NPSFM		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
om/watch?v=fvfWArtW_uw https://www.ecan.govt.nz/your-region/your-environment/our-natural-environment/mahinga-kai/		Includes specific detail on **potential mahinga kai resources**, covering the full range of mahinga kai resources as envisaged in the NPSFM	resources. There is a benefit to using tools that clearly integrate this view, and guide the user to consider them.	associated with wai, such as waterways, lake and wetland margins.
	17	Does not specifically include processes that cater for **place-based** mahinga kai **customs and practices**, incl. tikanga and the principles of manaakitanga, kaitiakitanga, and rangatiratanga	It is very important that through the NOF process, and in considering mahinga kai, that the Te Ao Māori view of mahinga kai is followed, and this requires a people-focussed culturally-appropriate approach. There is a benefit to using tools that clearly apply this lens, and guide the user to cater for these principles in developing mahinga kai in terms of the NOF.	Mahinga kai is about tangata whenua, their ability to exercise mana whenua and undertake their customs and practices, according to their tikanga and kawa, with a Te Ao Māori worldview, within a Te Ao Māori framework.
		Partially includes processes that cater for **place-based** mahinga kai **customs and practices**, incl. tikanga and the principles of manaakitanga, kaitiakitanga, and rangatiratanga		
		Specifically includes processes that cater for **place-based** mahinga kai **customs and practices**, incl. tikanga and the principles of manaakitanga, kaitiakitanga, and rangatiratanga		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
	18	Does not specifically provide for a **local (place-based) approach** to mahinga kai **resources**, specifically providing for **mana whenua**	Mahinga kai will vary between iwi, hapū, and whanau, and therefore across catchments and sub catchments; the role of tangata whenua as kaitiaki requires place-based approaches	
		Partially provides for a **local (place-based) approach** to mahinga kai **resources**, specifically providing for **mana whenua**		
		Specifically provides for a **local (place-based) approach** to mahinga kai **resources**, specifically providing for **mana whenua**		
	19	Does not include specific detail on **tangata whenua societal / cultural aspects** of mahinga kai	It is very important that through the NOF process, and in considering mahinga kai, that the Te Ao Māori societal / cultural	For example: Tangata whenua can exercise manaakitanga because kai is 'plentiful' and 'fat' for hosting

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Includes some detail on **tangata whenua societal / cultural aspects** of mahinga kai	aspects of mahinga kai are followed. There is a benefit to using tools that clearly apply this lens, and guide the user to cater for these aspects in developing mahinga kai in terms of the NOF. **Are mahinga kai resources described in ways that are relevant to tangata whenua?**	manuhiri; kaumatua and kuia transfer knowledge; traditional fishing practices are known; tangata whenua participate in the preparation, storage and cooking of kai; community members are involved in undertaking customs and practices in the field
		Includes significant detail on **tangata whenua societal / cultural aspects** of mahinga kai		
	20	Does not include specific detail on '**invisible' mahinga kai** issues	In concert with degraded freshwater values, arguably the most significant impediment to mahinga kai customs and practices around the country comprises land-legal and regulatory limitations.	Included here are: Access issues related to private land ownership; locked gates; regulation; Department of Conservation resource use limitations; issues of tapū preventing resource use; rāhui; mataitai; fisheries controls; etc.
		Includes some detail on **'invisible' mahinga kai** issues		

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		Includes significant detail on **'invisible' mahinga kai** issues	In order to achieve envisaged mahinga kai outcomes, it is as important to resolve these 'invisible' issues.	
Cultural health of the waterbody / Mauri as an indicator	21	The tool does not provide for an indicator of **overall cultural health** of the waterbody e.g. Mauri / another measure as an indicator **- indigenous science / mātauranga Māori**	Important for monitoring and reporting	N/A
		The tool partly provides for an indicator of **overall cultural health** of the waterbody e.g. Mauri / another measure as an indicator - **indigenous science / mātauranga Māori**		
		The tool provides for an indicator of **overall cultural health** of the waterbody e.g. Mauri / another measure as an indicator - **indigenous science / mātauranga Māori**		
Overall waterway health - Non-Indigenous Science	22	The tool does not provide for an indicator of **overall health** of the waterbody - **Non-Indigenous Science**	Important for monitoring and reporting	N/A

Category	Criteria	Descriptions - select one	Reason for inclusion in criteria	Additional comments / notes
		The tool partly provides for an indicator of **overall health** of the waterbody - **Non-Indigenous Science**		
		The tool provides for an indicator of **overall health** of the waterbody - **Non-Indigenous Science**		
Sustainable resource utilisation	23	The tool does not provide for **sustainable resource use**, linking the waterbody to future generations being able to undertake mahinga kai practices	Mahinga kai is not about the state of the environment from a traditional science / non-indigenous perspective. While the latter will focus on indicators of ecological health, mahinga kai is about tangata whenua connections with the wai, and the ability of the wai to provide is intrinsic to the mana of the wai. Sustainable resource use is therefore critical.	For example, the long-term harvest of key species, and therefore the abundance of that species, and its condition for consumption, is a driver (as opposed to protection of that species). This can lead to managing water specifically to promote the abundance of key species etc. Consideration of complete life-cycles of mahinga kai species would also be necessary, to ensure sustained provision.

Appendix 4 Glossary

Please note: te reo Māori terms are translated based on the context they have been used in this report. Māori to English translation may change depending on the context in used. This glossary provides a brief translation and does not cover the detailed definition of each term. Te Aka Māori Dictionary as well as additional resources listed below were used to compile this list of translations[14]:

Te Reo Māori	Te Reo Pākehā
A	
ahi kā	burning fires of occupation, continuous occupation of an area
ara tawhito	traditional travel routes
atua	ancestor with continuing influence, god, supernatural being, deity
awa	river, stream, tributary
H	
hapū	sub-tribes that make up larger iwi groupings, at local or district geographic level
hāngī	earth oven, food cooked in earth oven
hau kāinga	home, true home
hīnaki	eel basket
hononga	union, bond, relationship
hui	(verb) to meet, gather
	(noun) meeting, gathering
I	
iwi	tribal group
K	
kai	(verb) to eat, consume
	(noun) food
kaimahi	worker, practitioner
kāinga/kāika	home, abode, dwelling
kaitiaki	Māori resource manager/ person or agent giving benefit to the resource, environmental guardian

[14] Sources:
- Te Rūnanga o Kaikōura, 2007,
- Tipa et al., 2009
- Taura, van Schravendijk-Goodman, & Clarkson, 2017
- "Te Aka Māori Dictionary", 2022

kaitiakitanga	environmental guardianship, embodies a range of complex Māori environmental concepts
karakia	(verb) to recite ritual chants, say grace, pray, recite a prayer, chant (noun) incantation, ritual chant, chant, intoned incantation, charm, spell
kaumātua	elders (plural)
kaupapa	framework, philosophy, purpose, scope, topic, sets cultural framework for discussion
kaupapa Māori	approach, Māori agenda, Māori ideology
kawa	a ceremony to remove tapu from a new house or canoe
kete	basket
ki uta ki tai	recognising the connections across landscape, people and ecosystems - literally translated as "from the mountains to the sea"
koha	gift, present, offering
kōrero	(verb) to tell, say, speak, read, talk, address (noun) speech, conversation, narrative
kotahitanga	unity, togetherness, solidarity, collective action
kōura	freshwater crayfish (Paranephrops planifrons, Paranephrops zealandicus)
kuia	female elder

M

mahi	work
mana	prestige, authority, control, power, influence, status, spiritual power, charisma - mana is a supernatural force in a person, place or object
manaakitanga	practise reciprocity and generosity
mana atua	sacred spiritual power from the atua (god)
mana tangata	power and status accrued through one's leadership talents, human rights
mana whakahaere	the exercise of rights and responsibilities to ensure that the balance and mauri (life force) of the rohe (area) is maintained
mana whenua	tangata whenua (indigenous people) group or groups with primary mana whakahaere (rights and responsibilities) over an area
manuhiri	visitor, guest
marae	the area in front of a meeting house, often used to refer to the complex and surrounds of the meeting house
maramataka	Māori lunar calendar, calendar - a planting and fishing monthly almanac
mātāwaka	kinship group, tribe, clan, race, ethnic group; often used where Māori are from other tribes and their descendants migrate to other parts of the country, and are therefore not mana whenua.
mātaitai	seafood, shellfish - fish or other food obtained from the sea

matapono	principle, maxim
Matariki	Pleiades, the Seven Sisters – an open cluster of many stars in the Taurus constellation, with at least six stars visible to the naked eye
mātauranga Māori	Māori knowledge, Māori knowledge system, belief system, wisdom
maunga	mountain
mauri	life force, internal spirit or wairua, energy of system, links the physical to the spiritual world
moana	ocean
mokopuna	grandchildren, descendant
mōteatea	(verb) to grieve (noun) lament, traditional chant, sung poetry - a general term for songs sung in traditional mode

N

noa	to be free from the extensions of tapu
noho marae	overnight marae stay

Ng

Ngāi	Māori prefix for some iwi names with an ancestral name usually beginning with 'T', written as a separate word, e.g. Ngāi Tahu

O

ora	health

P

pā	traditional settlement
pātaka kai	food storage
pā tuna	eel weir
pepeha	(verb) a form of introduction, describing ancestry, connection to place (noun) iwi saying, iwi motto, proverb
pounamu	greenstone
pūkenga	specialist, expert
pūrākau	myth, legend, story
puna	spring, well, pool

R

rāhui	restricted, temporary, or regulated access to resources
rangatira	chief
rangatiratanga	authority, sovereignty
repo	wetland, swamp

rohe	region, district
rongoā	(verb) to treat, apply medicines
	(noun) natural remedy, traditional treatment
rōpu	group, committee
rūnanga/runaka	tribal/governing council, Māori assembly, iwi authority

U

urupā	burial grounds

W

wāhi taonga	treasured place, location
wai	water
wai ariki	chiefly waters
waiata	(verb) to sing
	(noun) song, chant, psalm
wai Māori	freshwater, mineral water
wai ora	healing waters
wairua	spirit, soul, spiritual dimension
wai tai	sea water, salt water
wai tapu	sacred waters
waiwera	hot water
waka	canoe
wānanga	(verb) to meet and discuss, deliberate, consider
	(noun) seminar, conference, forum, educational seminar

Wh

whānau	family, extended family
whanaunga	relative, relation, kin, blood relation
whaitua	designated space
whakairo	(verb) to carve
	(noun) carving
whakanoa	(verb) to remove tapu - to free things that have the extensions of tapu
	(noun) removal of tapu
whakapapa	ancestry, lineage, connection
whakataukī	proverb, saying
whakawhanaun-gatanga	process of establishing relationships, relating well to others
whenua	land, ground