

CULTURAL INDICATORS, MONITORING FRAMEWORKS & ASSESSMENT TOOLS



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1.0 Introduction

A holistic approach to environmental monitoring cannot ignore social and cultural values. Traditional monitoring carried out by Maori people was an essential part of survival in New Zealand. They developed an in-depth understanding of the environment upon which they depended. Their traditional view of the environment reflects an integrated approach that needs to be incorporated into a national or regional monitoring system by involving Maori people in planning and decision making at the regional level... Maori people with traditional knowledge of the environment and an understanding of traditional environmental indicators need to be empowered to contribute to a bicultural monitoring system. (Ward 1991)

While there is much ‘western’ science based monitoring undertaken across New Zealand, until the last decade there was little reflecting cultural health considerations. Cultural health information is important considering the significance of the natural environments to whanau, hapu and iwi history, identity and ongoing wellbeing. This report outlines the development of cultural health monitoring tools. The challenge for tangata whenua to ensure that m tauranga informs contemporary resource management is threefold:

1. it is dependent on the development of monitoring standards, methods and processes that are endorsed by tangata whenua as adequately reflecting their values, tikanga and m tauranga,
2. Whanau, hapu and iwi need to have the capacity and capability to undertake and be involved in cultural monitoring and related resource management forums.
3. The information needs to be in a format that it can inform decision making.

Over the last decade, whanau hapu and iwi have been active in developing different monitoring tools that allow them to systematically record, collate and report on the cultural health and wellbeing of significant sites, natural resources and environments within their rohe. As a result there are multiple indicators, frameworks and tools currently in use by tangata whenua across the country.

In this report the following monitoring tools are briefly described:

1. Ngati Kere Methods and Indicators for marine protection;
2. Te Roroa Iwi Cultural Indicators & Monitoring Framework;
3. Cultural Values in IDEAS;
4. CHI for streams and rivers;
5. CHI adapted by Tiakina te Taiao
6. A Coastal Cultural Health Index for Te Taitokerau;
7. CHI for kauri;
8. State of Takiwa;
9. Mauri model;
10. Kaitiaki toolz;
11. Kaitiaki.org;
12. Cultural Marine Health Index;
13. Cultural Health Index for Estuaries;
14. Cultural indicators for wetlands;

15. Report Cards – Waikato, Kaipara, Waitaki;
16. SHMAK;
17. Iwi Estuarine Toolkit;
18. Cultural Flow Preference Study;
19. RIVAS; and
20. Mauri of waterways kete
21. Assessing the properties of whenu and whitau harvested by whanau

2.0 An overview of the monitoring tools

In this section we summarise each of 20 tools listed above. Some of these tools have been described previously by Chetham et al (2010)¹. Where possible we have included the forms used in the field by tangata whenua.

1. NGATI KERE METHODS & INDICATORS FOR MARINE PROTECTION

Ng ti Kere in the Hawkes Bay defined indicators to assess the health of their rohe moana. Ng ti Kere identified their vision, values, species of importance and indicators of marine protection relevant to Ng ti Kere were identified (Wakefield & Walker 2005). A report is available that represents one part of a three-year Foundation of Research, Science and Technology (FORST)-funded research study of 'Maori methods and indicators for marine protection'.

This project recognised that there is a need to better understand how marine reserves and other methods of marine management contribute to meeting the objectives and interests of iwi/tribe and hapu. A better understanding of how different methods of marine management meet both iwi-hapu and other management interests is seen to lead to more positive outcomes for the marine environment. The joint project by Ngati Kere Trustee, the Department of Conservation and the Ministry for the Environment, involved two interrelated research teams: one working on community research and the other on ecological science.

Reference

Department of Conservation.(2005). Ngati Kere interests and expectations for the rohe moana. Retrieved from <http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-protected-areas/maori-methods/ngati-kere-interests-and-expectations-for-the-rohe-moana/>

2. TE ROROA IWI CULTURAL INDICATORS & MONITORING FRAMEWORK

Te Roroa iwi cultural indicators are based on Ng ti Raukawa's indicators identified under the Ng ti Raukawa Otaki River and Catchment Iwi Management Plan 2000. They

¹ Chetham, J., & Shortland, T., Nuttall, P., & Newell, A., (2010). *Maori Cultural Environmental Monitoring Stocktake*. Whangarei, New Zealand: Repo Consultancy Ltd.

emphasise that monitoring of their environment must be fully integrated with monitoring the health of Te Roroa iwi as people and as a culture. Indicators are grouped under four themes:

1. *Whenua/ngahere* – number of kukupa sustainably harvested from forests for cultural purposes. *If there are enough kukupa in forests that can once again be harvested then the forests are healthy.*
2. *Awa* – number of rivers in our rohe that are classed as pristine. *Waipoua River is classed as the most pristine river in Northland. All rivers should be that healthy.*
3. *Moana* – number of people commercially employed sustainably harvesting toheroa. *If toheroa stocks and habitat are improved to a point commercially harvest is sustainable manner, then the foreshore is healthy.*
 - a. number of marae able to provide sustainably harvested paua to manuhiri. *If there are plentiful and healthy paua then the coasts are healthy.*
4. *Hap* – the ability of hap to access materials and kai of cultural importance.
 - the rate of change of consumption and preparation of traditional plant and animal foods and medicines by Te Roroa, including ceremonial/cultural use as well as daily household use;
 - extent of practice or use of karakia, wananga, powhiri, whakatau, rahui, and other oral traditions related to the use of traditional foods and subsistence practices;
 - preservation and continued use of te reo o Te Roroa, songs, stories and ceremonies, traditional names for places, sites, foods and processes (planting, hunting, gathering, harvesting, preparation) and the rate of change and factors affecting these practices;
 - integrity of and access to sacred sites;
 - rate of rural-to-urban or urban-to-rural migration of Te Roroa;
 - number of occasions that Te Roroa whanau, hap members and representatives are effectively involved in planning, decision-making, implementation and evaluation processes undertaken by local government, agencies or other entities and the extent to which cultural concerns are considered and addressed.

Implementation of Te Roroa cultural indicators and monitoring framework is underway.

Reference

Integrated Kaipara Harbour Group (IKHMG) (n.d). *The World of Kaipara. Information Review & Gap Analysis. Chapter 11. Restoring the Mauri of Kaipara.* Retrieved from <http://www.kaiparaharbour.net.nz/Content/Publications/Chapter11RestoringthemauroftheKaipara.pdf>

3. CULTURAL VALUES IN IDEAS

An integrative tool for ICM and for managing HELP basins is scenario modelling which incorporates visualisation methods and offers a powerful way to explore and ‘see’ future landscapes and catchments based on various forms of decision-making and desired input. The FRST programme Integrated Catchment Management (ICM) in Motueka has developed an integrated modelling framework called IDEAS – Integrated Dynamic Environmental Assessment System which can link many models together to assist stakeholders and tangata whenua (iwi and hapu) in decision-making by seeing, testing, and planning various future scenarios.

Tiakina Te Taiao Ltd. provided constructive feedback about IDEAS and the use of ENVISION and there was interest about how such a tool could be practically used. The iwi research and working group identified the need to know more about:

- how to use the tool,
- how to record cultural data into the spreadsheet, use and change the scenarios,
- how they could be further involved in helping with the incorporation of cultural values into IDEAS and ENVISION.

The previous work of the iwi with GIS has given them an appreciation of the application and power of visualisation and mapping tools. They see the main value of new tools for resource management, policy work, and iwi projects, particularly helping with the articulation, expression, and communication of their cultural views during discussion and negotiation with groups such as: Central Government, Local Government, industry, research agencies, community groups and possibly with other iwi and hapu.

It was concluded that further collaborative research work with iwi researchers is required in order to make ENVISION work for Tiakina Te Taiao Ltd. It was agreed the best approach would be work with iwi researchers and to generate iwi-relevant examples that demonstrate how cultural values can be incorporated into future scenario modelling. Practical iwi examples could then be used to alter and explain tradeoffs between cultural, social, economic and environmental goals, priorities, and aspirations.

Reference

Oscar Montes de Oca Munguía Garth Harmsworth (May 2008) *Representing Cultural Values in IDEAS* Motueka Integrated Catchment Management (Motueka ICM) Programme Report

4. CHI FOR STREAMS AND RIVERS

The Cultural Health Index (CHI) was designed by Tipa and Teirney (2001, 2006) in response to a need by identified by Ngai Tahu. The purpose of the CHI is to provide a tool that can be applied by Tangata whenua to facilitate their input and participation in land and water management processes and decision-making. The result – the CHI for

streams - links cultural knowledge about stream health and Western science methods. The CHI comprises three components:

1. site status, specifically the significance of the site to Maori;
2. a *mahinga kai* (food gathering) measure; and
3. a stream health measure.

The first component assesses the significance of the site to Maori and asks them to distinguish between traditional and contemporary sites. A traditional site is one that continues to sustain the cultural uses and practices for which the site has been valued by Maori over successive generations. In contrast a contemporary site is one with limited cultural associations that is being assessed for other reasons, for example, at the request of a developer or because a specific issue has arisen, e.g. erosion. The first question requires a site to be classified:

- A means the site is a *traditional* site of significance to Maori; or
- B means that the site is not traditional and has been included to enable other aspects to be considered e.g. it could be a site that is monitored by the regional council).

The second question asks whether Maori would return to the site in the future, believing that it is able to sustain the cultural uses that it has had in the past. If Maori would return, the site is awarded a 1 and if not, a 0.

The second component of the CHI requires an assessment of the *mahinga kai* values of a site. Inclusion of this component in the Index recognises that the life and vitality of a waterway is tangibly represented by some of the physical characteristics of a freshwater resource, including: indigenous flora and fauna; water clarity, water quantity, and the *mahinga kai* it yields (Ministry for Environment, 1997). There are four parts to the “*mahinga kai* measure” of the CHI. The first part (a) requires the identification of *mahinga kai* species present at the site. A list of plant, bird and fish species is prepared. A score, 1 - 5, is then assigned, depending on the number of species present. The second factor (b) requires a comparison between the species present today and the traditional *mahinga kai* sourced from the site. This was deliberately factored into the design of the CHI to recognise that maintaining cultural practices, such as the gathering of *mahinga kai*, is an important means of ensuring the transference of cultural values through the generations. Cultural continuity means that greater value is likely to be assigned to sites of traditional significance that continue to support the *mahinga kai* species sourced in the past. A single score, 1 - 5, is assigned.

Mahinga kai implies that Maori have physical and legal access to the resources that they want to gather. The third component of the *mahinga kai* measure (c) therefore requires a score of 1 - 5 to be assigned to each site based on the ability to access the site, where 1 equals no access and 5 equals unimpeded legal and physical access. The fourth element in the *mahinga kai* measure (d) requires Maori to assess whether they would return the site in the future and use it: No - scores 1, Yes - scores 5. The four *mahinga kai* elements are then averaged to produce a single score out of 5.

The third and final component of the CHI is the stream health measure. Of the nineteen indicators originally identified by *kaumatua* (respected Maori elders), eight that can be

defined objectively and most appropriately reflect Maori evaluations of overall stream health are included in the Stream Health Measure. The stream health measure is derived by averaging the 1-5 scores awarded to the eight factors (catchment land use, riparian vegetation, use of the riparian margin, riverbed condition, manipulation of the river channel, a visible flow, water clarity and water quality) to give a final stream health measure from 1-5.

The CHI when applied to a specific site will result in a score, for example such as A-0/2.56/1.06 which was the result of the assessment for the site at Island Stream (in the Kakaunui catchment).

CHI and mauri - The CHI recognises that the mauri is tangibly represented by the physical characteristics of a freshwater resource, including indigenous flora and fauna, the fitness for cultural usage and its productive capacity. Different to current resource management approaches which are very technical, rather than based on a holistic philosophy that M ori utilise to protect the mauri of a stream or river.

Recording forms

Forms are included as [Appendix 1](#)

Reference

Tipa G. Teirney, L. (2006) *Using the Cultural Health Index: How the assess the Health of Streams and Waterways* Ministry for Environment Reference ME711

Tipa G. Teirney, L. (2005) *A Cultural Health Index for Steams and Waterways: A Tool for National Use* Ministry for Environment

Tipa G. Teirney, L. (2003) *A Cultural Health Index for Steams and Waterways: Indicators for Recognising and Expressing Cultural Values* Ministry for Environment Technical Paper 75. ME number 475

5. CHI FOR KAURI

Shortland when reviewing the tools available for use by tangata whenua identified that there no known publications on cultural health indicators specifically designed for kauri forests.

There were several steps in the development of the CHI for kauri. A literature review was carried out to assess the current level of information available regarding kauri ngahere health indicators. Extensive interviews with kaumatua, kuia and other experts in kauri ngahere were held to develop the values to guide the indicators and recommendations for a monitoring programme. The draft was then peer reviewed by Juliane Chetham and kaumatua and was then work-shopped with the Tangata Whenua Roopu. The outcome is a Matauranga Maori approach to assessing and monitoring kauri ngahere. A first step in defining a monitoring programme to ensure kauri health is to consider the requirement to widen the scope of the health assessment to the other species which are known to coexist with kauri. The Maori common word for forest is

“ngahere” which means the binding of diverse species living together. One cannot thrive without the other.

The species selection process was:

Step 1 – inclusion of species which have been found living on kauri

Additional to interview findings a paper whereby seven trees in Waipoua were examined in widely scattered localities. Besides climbing the trees, much, observation was done from the ground. As many as 36 species were found on one tree. Altogether a total of 53 species belonging to 37 genera were numbered. Of these, 21 species were true epiphytes, two were climbers, eight or nine were forest trees and the rest were small plants usually found on the ground.

Step 2 - inclusion of species which have been identified living around kauri - Again interviews and research of websites and publications was carried out to identify species which coexist with kauri.

Step 3 - delimitation of species not referred to by interviewees and publications or websites researched of cultural values

Reference

Tui Shortland (2011) *Cultural Indicators For Kauri Ngahere* Repo Consultancy Ltd

6. A COASTAL CULTURAL HEALTH INDEX FOR TE TAITOKERAU

The need for models for measuring the health of coastal sites or mahinga kai has been identified by Tangata whenua. Such tools are essential for groups that are in the process of developing rohe moana management plans for their customary fisheries. To date, the majority of work in this area has produced coastal monitoring toolkits or programmes for communities that based on western scientific methods. The Hauraki Gulf Forum has produced a community shellfish monitoring guide and others have produced methods specific to hapu and iwi (Otaraua Hapu et al, 2003). NIWA are currently developing “Ng Waihotanga Iho” – an Iwi Estuarine Monitoring Toolkit. This toolkit will feature a series of modules on habitat mapping; sediments; water and sediment quality; plants; fish; shellfish and coastal management (NIWA, 2009).

This project has centered on adapting the CHI framework to coastal scenarios in Te Taitokerau. The CHI model was preferred over the western science based methodologies discussed above due to its incorporation of cultural indicators. Chetham explains how hui with regional iwi resource managers and collective hapu forums confirmed interest in the project and help identify participants. Patuharakeke, Ngati Rehia, and Nga Hapu o Ahipara were selected based on their capacity, experience in coastal management and monitoring, and the level of support from their governance bodies and communities. Each hapu selected a project coordinator to oversee the monitoring team, data collection and undertake data analysis

Reference

Chetham, J., & Shortland, T., (2010) *A Coastal Cultural Health Index for Te Taitokerau*, Whangarei, New Zealand: Te Runanga o Ngati Hine

7. STATE OF TAKIWA

State of the Takiw (Pauling 2006) is defined as

an environmental monitoring and reporting approach that integrates Mātauranga Māori and western science to gather information about the environment and to establish a baseline for the creation of policy and improvement of environmental health. A program developed as an alternative to conventional state of the environment reporting used by the Ministry for the Environment, that takes into account tangata whenua values.”

The State of the Takiw (SoT) forms a component of the overarching Ng i Tahu ki uta ki tai natural resources plan, where wananga mahinga kai, a resource inventory and GIS database will contribute also to deliver the plan.

State of Takiwa integrates CHI and E-coli testing with parts of SHMAK, Forestry Owners Resource Management Assessment Kit.

Development - The demand for the development and reporting of SoT was for the need to address the lack of Ng i Tahu Whānui and/or cultural values in Regional Council monitoring programs and reporting of air, land, water and coast. There were three themes reflected in SoT: (1) Mahinga Kai, (2) Mauri, mana, manaaki (hospitality), and (3) Mātauranga.

Mahinga kai (and whakapapa) is the main contributor with which Ng i Tahu identify themselves with the whenua (land) and moana (sea) (Te Runanga o Ngai Tahu 2004). Mahinga kai (translated by Ng i Tahu as „working for food”) customs underpin Ng i Tahu and are central to their relationships with places, resources and their ongoing spiritual, economic, social and cultural wellbeing. Ng i Tahu require that to undertake direct food gathering, rivers, beaches, oceans and forests must be in pristine condition and are “good enough to eat from” (Te Runanga o Ng i Tahu 2004). It is vital that species and their habitats are maintained in pristine condition to fulfill this relationship.

Mauri, mana and manaaki are fundamental values that Ng i Tahu required to be part of any environmental monitoring and reporting. Mauri is both a physical and metaphysical expression of environment health (Te Runanga o Ng i Tahu 2004). The mauri in all living and non-living objects originates from the beginnings and is a value that is distinguished by qualities of health, abundance, vitality, the pristine and unpolluted. Mauri is a sacred taonga to Ng i Tahu that is an integral to their whakapapa, which provides a spiritual link to the past, the present and to the future; hence Ng i Tahu vision to “continue to provide for our people and our manuhiri (visitors), now and in the future mo tatou, a, mo ka uri a muri ake nei – for us and our children after us.” Upholding the mauri for Ng i Tahu has a direct relationship to their ability as an

iwi/hapū or whanau to provide manaaki to their manuhiri and in turn has an effect on their mana.

Mātauranga is traditional knowledge that has been gained through centuries of observation and the continued practice of mahinga kai customs for Ngā i Tahu (Te Runanga o Ngā i Tahu 2004). They have unique body of knowledge and experience that is important to understand and manage the natural environment, particularly the health and wellbeing of the mauri. This in turn provides Ngā i Tahu to provide historical accounts and knowledge of the past and changes that have occurred to the natural environment in their Takiwā.

Application of State of the Takiwā - Baseline Information – is collected from the past (interviews, manuscripts, literature) and present/current (provided from councils and Crown departments, CHI, SHMAK, national/regional monitoring data, interviews) information. This collection of information forms the core of the current state of the Takiwā. It was important for Ngā i Tahu to gather information on the past (1840 baseline) so they can understand the health of the environment as it was to their tupuna and the present baseline information provides an idea of what has happened since. Desktop research of written records, drawings, paintings, photographs was used to form a „state“ of the Takiwā at 1840.

Monitoring – the design of the monitoring program depended on the sites (e.g. freshwater, lake, coast, marine), indicators and tools. Sites were chosen based on historical use, level of written and oral information, access, and relationship to existing monitoring sites (particularly local and regional council monitoring sites). Indicator type was determined for each monitoring program and determined from what the program was going to be reporting on, such as a resource (e.g., Tuna), issue (e.g., water pollution), or ecosystem (e.g., lake). The type of tools required will be dependent on the site and the indicator (e.g., SHMAK kit, Cultural Health Index tool). Te Runanga o Ngā i Tahu have completed several SoT baseline reports, such as, for the Avon-Heathcote estuary and catchment (Pauling et al. 2007a) and South Island freshwater waterways (Pauling 2007b).

Analysis – Ngā i Tahu recognised the importance of storing, accessing and analysing the information collected for the SoT program and have developed, with the support of the Ministry for the Environment, their own Takiwā 2.0 Database. A combination of hard copy literature, Microsoft Access databases and Geographic Information System (GIS) databases are utilised and stored. The Ngā i Tahu resource inventories and information databases are strongly integrated with the SoT and Ki Uta Ki Tai Plans where information gathered through baseline studies, monitoring and reporting will be stored and organised.

Reporting/Policy Development – this is the final product of the monitoring program and includes baseline monitoring reports and annual/seasonal reports. These reports will inform policy direction and development for Te Runanga o Ngā i Tahu.

Recording forms

Forms are included as Appendix 2.

Reference

Pauling, C. Lenihan, Te Marino. Rupene, M. Tirikatene-Nash, Nukoroa. Couch, Rewi. (2007). *State of the Takiwa: Cultural Health Assessment of the Avon-Heathcote Estuary and its catchment*.

8. MAURI MODEL

The mauri model developed by Kepa Morgan of Mahi Maioro Professionals is a set of assessment criteria corresponding to the four aspects of sustainability (environment, culture, society and economy) are four levels or spheres: the environment, hapu, community and wh nau (Figure 1).

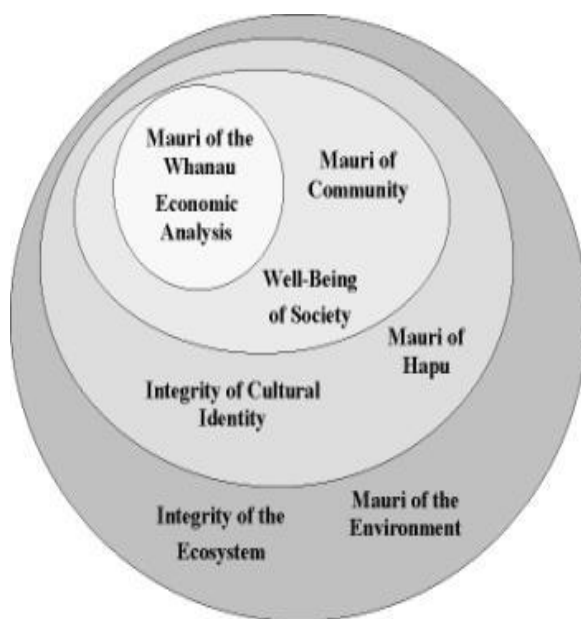


Figure 1: Mauri Model
(Morgan, 2004)

The sizes of each circle reflect the fact that aspects are weighted to give a greater emphasis to wide-reaching concerns. Note that community refers to the needs of the community at large (M ori and non-M ori) and includes future needs such as land availability, job creation and recreational opportunities. Generally the weightings used would be 40 % environment, 30 % hapu, 20 % community and 10 % wh nau. At each level, the effect of a development, project or process on mauri is given a rating as indicated in Table 1:

Table 1: Rating of Effects on Mauri (Morgan, 2004a)

Effect on Mauri	Rating
Enhancing	+2
Maintaining	+1
Neutral	0
Diminishing	-1
Destroying	-2

Scores at each level are then multiplied by the appropriate weighting to give a final result. It should be noted that there are a wide range of factors that determine the effects on mauri. The assessment of effects should be carried out by Tangata Whenua or addressed in consultation. At first glance, this may seem like another sustainability measurement technique that does not properly address sustainability. However there are some significant differences:

- connections between levels emphasised
- mauri as the life-force is indicative of long-term sustainability
- mauri includes spiritual and physical aspects
- analogous Western scientific definitions allow easy interpretation

While the mauri model is intended to be introduced to address some needs specific to M ori, mauri as the life-giving ability of an ecosystem could also be a valuable concept in Western sustainability science. Although mauri is a qualitative measure, it is analogous to indicators such as faecal coliform levels or species biodiversity used in Western science. Morgan (2004) gives the example of Lake Rotorua. The diminished mauri of the lake resulting from wastewater discharges led to diminished mauri of the community, which manifested itself in cases of Blue Baby Syndrome. From a scientific standpoint, contamination of drinking water with nitrates led to infantile methaemoglobinemia, but however it was described, the overall effect was still the same. Morgan asserts that had the mauri model been applied, wastewater discharges to Lake Rotorua would not have been acceptable, and the human health effects could have been avoided.

Reference

Te Kipa Kepa Morgan, Brian. (2004). *A tangata whenua perspective on sustainability using the mauri model: Towards decision making balance with regard to our social, economic, environmental and cultural wellbeing*. International Conference on sustainability engineering and science.

Morgan, K. (2003). *The sustainable evaluation of the provision of urban infrastructure alternatives using the tangata whenua mauri model within the smart growth sub-region*. Technical report, Mahi Maioro Professionals.

9. KAITIAKI TOOLZ

A web-based information resource – Kaitiaki Toolz – is being developed by NIWA to assist people involved in resource consent processes. The website focuses on the potential impacts of land-use change or point source discharges on freshwater mahinga kai. Mahinga kai describes the practice of customary gathering of food and natural materials, and the places where those resources are gathered, including rivers, lakes, and streams.

Kaitiaki Toolz will provide scientific information on the potential environmental effects (both negative and positive) of activities for which resource consent is sought, as well as possible mitigation options and links to monitoring tools and regional plans. It will form

a basis for developing resource consent submissions under the Resource Management Act.

Reference

Retrieved from http://www.niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools on April 2012

10. KAUPAPA.ORG

This website presents a range of practical tools to help Iwi and M ori organisations promote their kaupapa through:

- their organisation's operations
- measuring and monitoring their tribal programmes
- ensuring their commercial activities remain consistent with their kaupapa values and priorities.

Tools for all Organisations

Iwi and M ori organisations are committed to realising particular kaupapa and typically ascribe to values drawn from tradition and ancestral practise. Kaupapa M ori values and standards must be embedded across all aspects of the organisation. The tools in this section compile resources and ideas about how Iwi and M ori organisations can 'practice what they preach' through policies, procedures and practices;

- Give effect to kaitiakitanga through an environmental management system
- Employ principles of accountability through participatory mechanisms
- Embed kaupapa into governance decision making
- Incorporate kaupapa into human resources management

Commercialism and Iwi M ori

Through successful wh nau entrepreneurs, SME owners, M ori land trusts and Iwi gaining significant capital injections, the Iwi M ori economy is increasingly assuming a place of strength and influence in the New Zealand economy. 21st century commercialism is important. Iwi M ori commercialism seeks to balance:

- generating revenue to fund tribal programmes that contribute to the kaupapa,
- reasserting our place in our ancestral landscapes,
- living our values, vision and priorities.

Models for Contributing to the Kaupapa - Simple Financial Contribution

- Financial Contribution and Identified 'No-Go' Areas for Investment
- Financial Contribution, Identified 'No-Go' Areas for Investment and Positive Contributions to Kaupapa
- Financial Contribution and Positive Contributions to Kaupapa Values and Priorities

Kaupapa principles and policies that can help include - Screening out investment that is inconsistent with kaupapa values, visions and priorities.

- Principles
- Process Policies and Practices

Kaupapa Outcome Targets (Goals) - Tools to help organisations develop specific targets according to their traditions, values and vision.

- Indexes and Accreditation Frameworks
- Asset Allocation Framework
- Feasibility Studies and Business Plans
- Planning Processes
- Impact Reporting

Multipliers Within Tribal and M ori Economies - The local multiplier tool measures how much monetary benefit is circulated and recycled within a community. Using a multiplier assessment can help identify how much they are contributing to local economic growth.

Multiple Bottom Line Evaluation - The ‘triple/quadruple bottom line’ applied to a kaupapa M ori framework.

Trade Off Modelling - Reconcile competing values and priorities between kaupapa values and profit.

- Ecosystems Modelling
- Social and Cultural Return Modelling
- Using SROI
- Examples of Financial Proxies

Tribal Programmes

The kaupapa indicator bank is intended to help measure and track the performance of what actually matters – the kaupapa. By improving the rigour of assessment of which projects and programmes contribute to the kaupapa, it will help with getting better at doing what matters. That is it will improve decisions around resource allocation (what to fund and how much), and ultimately assist in getting the biggest bang for limited tribal bucks.

The Model - The kaupapa indicator bank was developed on the basis of two key assumptions:

- That the real reason for the work of Iwi and M ori organisations is to contribute to the retention and strengthening of hap and Iwi (or M ori) identity, and all of the work we do should contribute directly or indirectly to this mission
- That all the work of Iwi and M ori organisations should create benefit for wh nau and hap

The kaupapa indicator bank therefore seeks to:

- Create indicators that represent the ultimate kaupapa driving the work of Iwi and M ori organisations. These indicators endeavour to represent the successful outcome or impact that the tribal programmes are seeking to contribute to or generate
- Identify data sources so that organisations can track their performance over time against the kaupapa indicators

It is a reasonably comprehensive performance management system for the work of Iwi and M ori organisations, but it will require some efforts to implement and most likely, will also require some degree of adaptation so that it is consistent with the unique traditions and values of each Iwi and M ori collective.

Reference

McMeeking, S. (n.d.) *Practical tools for Iwi and Maori organisations - kaupapa.org*. Retrieved from www.kaupapa.org

11. CULTURAL MARINE HEALTH INDEX

The Marine Health Index (MHI) is based on community knowledge and is a practical tool being developed by Te Tiaki Mahinga Kai (a national network of tangata kaitiaki, kaumatua, environmental managers, researchers, formed to improve management of m taitai, taiapure, temporary closures (rahui)) for Te Runanga o Ng i Tahu. The MHI builds on the Cultural Health Index for streams and waterways (Tipa & Teirney 2003), and applies similar methodology to the rohe moana.

The key factor to its development is that the MHI is developed for and with a particular community of people. The MHI uses science and community knowledge. The vision of the project is for the MHI to become a tool for communities to judge the state of their m taitai and taiapure themselves in an independent, inexpensive and scientifically robust manner. Key indicators that have been nominated include: continuation of traditional harvest practices, changes in the taste, smell and size of kai, and visual water pollution and litter.

Te Tiaki Mahinga Kai are currently working with the Te Whaka A Te Werra m taitai (Paterson Inlet, Rakiura, Stewart Island) and East Otago Taiapure at Karitane to develop the MHI.

Te Tiaki Mahinga Kai is working with the management committees and community members associated with the Te Whaka Te Wera M taitai (Paterson Inlet, Rakiura) and East Otago Tai pure at Kar tane.

It is envisaged that the MHI can be adapted and applied to coastlines around the country. Community members will be able to easily record and begin building up an archive of observations from a range of people. As more people use the MHI over months and years, long-term changes in environmental health can be used to support additional management actions and restoration activities. Comparisons between areas can also shed light on the health of New Zealand's marine environments as a whole.

Reference

<http://www.mahingakai.org.nz/research/marine-cultural-health-index-a-ngai-tahu-research-initiative>

12 CULTURAL HEALTH INDEX FOR ESTUARIES

Nelson City Council (NCC) approached Landcare Research Manaaki Whenua and Tiakina Te Taiao Ltd. to provide advice and expertise on cultural monitoring tools for estuarine areas within the NCC administrative area. This information was deemed necessary by NCC in order to enhance scientific monitoring in the four estuaries within the bounds of Nelson City and to give a fuller picture of their environmental health and cultural use.

The desire by Tiakina is that NCC will use this work as a basis for developing cultural input, assessment and advice into future state of environment (SOE) reporting and for council decision-making, management plans and assessments in relation to these estuaries.

The four estuaries within the administrative area of NCC are Kokorua Inlet, Delaware (Wakapuaka) Inlet, The Haven (Paruroa) and the eastern edge of the Waimea Inlet. Wakapuka Inlet was chosen as a case study in which to trial and establish monitoring sites.

A report is available that contains:

1. A brief review of iwi/cultural literature and knowledge (matauranga) on monitoring tools and indicators/indices applicable to coastal and estuarine environments.
2. A monitoring form for the collection and analysis of cultural health data gathered from estuaries across the rohe of Tiakina te Taiao.
3. A guide for the use of the monitoring form above.
4. Recommendations on a set of methods and iwi indicators that can be used in the NCC area for estuarine and sub-tidal environments along with a suggested monitoring programme.

Recording forms

Forms are included in the final report.

Reference

Walker, D. (2009). *Iwi Estuarine Indicators for Nelson*. Retrieved from <http://www.envirolink.govt.nz/PageFiles/425/628-nlcc31.pdf>

13 CHI (TIAKINA TE TAI AO TRUST / TE TAU IHU)

The Ministry for the Environment, through the Ministers Sustainable Management Fund, has agreed to financially support a community project sponsored by Tasman District Council (TDC) called Reservoir Creek: Restoration of an Urban Stream. Reservoir Creek is very visible to the community in an urban setting. Surrounding land use has generated considerable interest in recent years. In particular Community social and cultural wellbeing has been degraded by sedimentation created by subdivision, lack of adequate riparian zones and esplanade reserves, pollution by way of stormwater drains and direct discharge, channelisation and invasive introduced self seeding noxious vegetation. Prior to project implementation TDC representatives attended two hui's to present Reservoir Creek project to tangata whenua ki Whakatu. Tangata whenua supported the project in principal and requested that an assessment of cultural health indicators (CHI) be formally considered for Reservoir Creek involving their participation.

The purpose of this CHI assessment was to develop a tool to facilitate the input and participation of tangata whenua ki Whakatu (the six iwi affiliated to the Whakatu Marae) into the land and water management processes and decision making on Reservoir Creek.

Wai (water) is an essential element of life-life can not survive without wai. For tangata whenua ki Whakatu, the six iwi affiliated to Whakatu Marae (whose rohe includes Reservoir Creek), wai represents the lifeblood of Papatuaanuku (Earth Mother) and the tears of Ranginui (Sky Father). Wai symbolises the spiritual link between past and present. Nga awa (rivers) have mauri (life force) and mana (status) of their own and therefore are taonga (treasures) to tangata whenua ki Whakatu. The mismanagement of Reservoir Creek impinges directly on the ability of tangata whenua ki Whakatu to practice customs and traditions associated with wai. Loss of access to wai and the life it sustains therefore prevents tangata whenua ki Whakatu from maintaining undisturbed possession of their culture.

To facilitate the CHI on Reservoir Creek it was first necessary to recognize the tangata whenua environmental indicators for nga taonga tuku iho ki Whakatu (the sacred resources of Nelson). The foundation for the development of these environmental indicators is based on a tangata whenua worldview statement-an introduction to tangata whenua beliefs, values and practices associated with the natural environment. In conjunction with the worldview statement, tangata whenua ki Whakatu focused on developing environmental indicators for wai Maori (freshwater) and a report was commissioned in 2004. Using the Maitai River in Nelson as a case study to identify and test possible indicators the project was completed in August 2005.¹ The indicator form developed from this evaluation was used on Reservoir Creek follows.

Recording form

Whakatu Iwi Indicators form – Freshwater/Wai

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

Reference

Tiakina te Taiao Trust (2007). *Cultural Health Index for Reservoir Creek*. Ministry for the Environment, Tasman District Council.

Young, Roger. Harmsworth, Garth. Walker, Dean. James, Trevor. (2008). *Linkages between cultural and scientific indicators of river and stream health* Motueka Integrated Catchment Management (Motueka ICM) Programme Report.

14. CULTURAL INDICATORS FOR WETLANDS

Phase 2 of the Coordinated Monitoring of New Zealand Wetlands Project provided a nationally consistent indicators and tools for coordinated monitoring of wetland condition and trend in New Zealand. Goal 2 of the wetlands project sought to identify, establish, and document a set of generic set of matauranga Maori (iwi and hapu) indicators for wetland condition and trend. Goal 2 was organised into 3 parts: outputs 2a, 2b, and 2c:

1. Output 2a: Record and identify a generic set of matauranga Maori (iwi and hapu) based indicators for wetland condition and trend
2. Output 2b: Field trial, verify, and calibrate matauranga Maori based indicators for national application
3. Output 2c: Determine a set of generic Maori wetland indicators for national application and document final results in one report.

Goal 2 also made recommendations on the potential use of information systems for Maori environmental monitoring and how these could be linked for national application. Methods included working with a number of iwi and hapu representatives, Maori researchers, and kaitiaki communities in wetland areas, partly based on former relationships and contacts established in the Phase 1 project (Harmsworth 1999; UNEP/GRID 1999b). The first part of Goal 2 (Phase 2) was to establish contact again with a number of Maori organisations, iwi, hapu, and individuals (since Phase 1), and develop a memorandum of understanding or partnership with some of these groups, and a working relationship with others. A number of wetland sites were then selected based on these relationships and contacts. The wetland study areas included those from North Island regions: Auckland, Waikato, Bay of Plenty, central North Island, and Manawatu/Horowhenua; and South Island regions: Canterbury/Otago/ and Southland. This included the addition of a number of culturally significant wetlands. Once contact had been made, steps involved developing an understanding of Maori concepts and approaches for each area, identifying and building on previous indicator work, understanding Maori values and aspirations, developing appropriate frameworks and classifications for indicator development, and determining methods for environmental assessment and reporting. Conceptual approaches and Maori knowledge was recorded during field visits, hui, one-on-one interviews and discussion with Maori resource managers, researchers, planners, and kaumatua, and interaction with other wetland specialists. A range of wetland environmental performance indicators were identified and recorded through hui/workshops and field visits.

The second part of the project (output 2b) was to field trial, verify, and calibrate the Maori wetland indicators recorded in output 2a, and to evaluate their effectiveness for national application. A set of environmental wetland indicators for national application were identified and evaluated for use in national assessment and reporting. All methods and results are documented in the final report.

Recording forms

Forms are included as Appendix 3.

Reference

Harmsworth, G., (2002) *Coordinated Monitoring of New Zealand Wetlands, Phase 2, Goal 2: Maori environmental performance indicators for wetland condition and trend*, Landcare Research

Harmsworth, G 1999. *Coordinated monitoring of New Zealand wetlands. Building Iwi Partnerships*. Landcare Research Contract Report LC 9899/085. April 1999. Prepared for UNEP/GRID Christchurch and Ministry for the Environment, Wellington.

15. REPORT CARDS

Increasingly Integrated report cards are being used around the world to define and measure progress towards environmental sustainability. Report cards can be an effective communication and engagement tools and when used effectively, can be a key driver in securing commitment and action. There are numerous examples of reporting frameworks e.g.

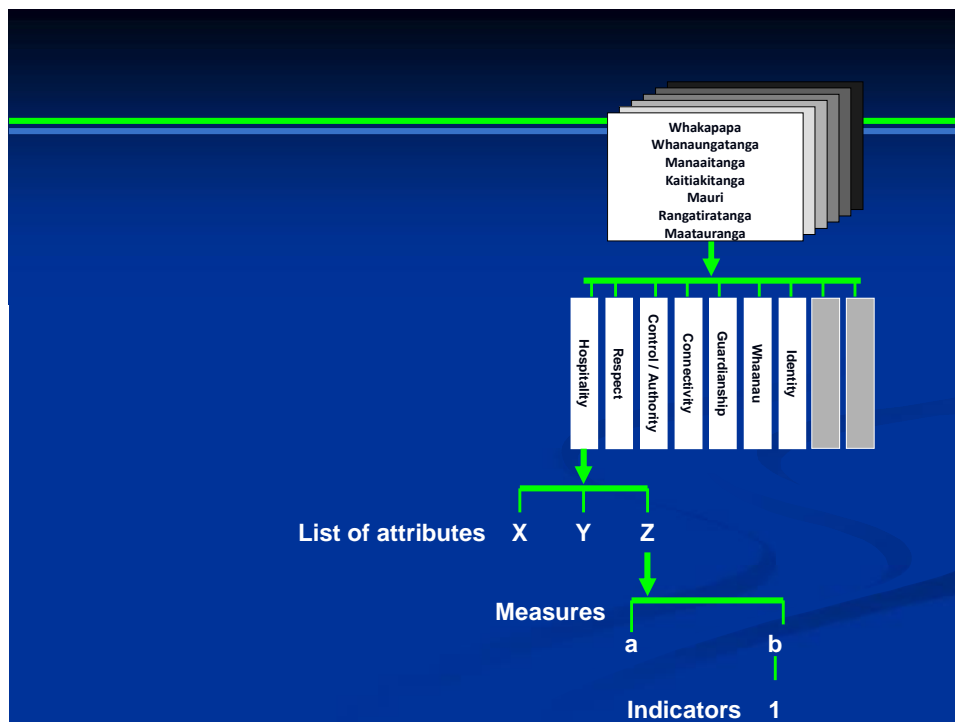
- Environment Southland State of the Environment (SoE) reporting;
- the Chesapeake Bay Program (CBP, 2006); and
- the San Francisco Bay Index (TBI, 2005).

Although there is no formal definition of an integrated report card, a number of principles that should underpin a report card can be identified. It should:

- Be simple to understand, yet be underpinned by sound, quality-assured science;
- Integrate a range of data types and have indicators that have a sound conceptual basis;
- Harness existing long-term data collection systems enabling trends to be identified;
- Incorporate model outputs from catchment, hydrological, ecological and social models;
- Provide information not only on resource condition, but also on causality and management options;
- Support evaluation of the effectiveness of actions from sub-regional to landscape scales;
- Include social and economic dimensions to inform decision frameworks;
- Identify, address and incorporate knowledge gaps in our understanding; and
- Not only detect change in indicators of environmental health, but to diagnose causes and the system interactions among causes so as to provide useful feedback to support adaptive management responses.

Despite identifying common principles, each reporting framework will address issues specific to a given region and a given area and set of issues. From the perspective of Tangata whenua, it is not always explicit how report cards respond to the cultural conceptualisations and values of Tangata whenua. Recent developments in New Zealand seek to develop values based report cards e.g. Waikato, Kaipara and Waitaki. The framework (of overarching

principles, values, attributes, measures and indicators) being applied in the Waikato is presented in the slide that follows.



Reference

NIWA. (2010). *Waikato River Independent Scoping Study*. Retrieved from <http://www.mfe.govt.nz/publications/treaty/waikato-river-scoping-study/appendix-30-reportcards.pdf>

16. SHMAK

The Stream Health Monitoring and Assessment Kit (SHMAK) was developed by NIWA in partnership with Federated Farmers of New Zealand, for farming families to monitor the “health” of the streams that flow across their land. The methodology can also be used by community groups, schools and regional councils, or anyone wishing to obtain an idea of general “health” of particular streams and freshwater waterways. The SHMAK Kit philosophy defines “health” as the condition of the whole waterway, where water quality and ecology are measured. Like most monitoring long-term data trends are required to provide a robust and adequate picture of “health” using standard set of measurements and observations each sampling period. The kit comprises:

- a manual with monitoring forms, full instructions and background information;
- coloured identification guides for bugs and slime;
- a set of monitoring equipment including: water clarity measuring tube, conductivity meter, pH papers, thermometer, sample containers, magnifier and more.

SHMAK allows you to measure stream health. You select 10-metre-long monitoring sites. At regular intervals (say, every 3 months) you record a set of measurements and

observations on a standard form. This takes little more than 1 hour per site. Each time you monitor you can apply a scoring system to the information you collected about the stream. The score totals can then be plotted on a graph to give you an immediate visual impression of how healthy your stream is and how it is changing over time. Aspects of SHMAK have been included in State of the Takiwa.

Reference

<http://www.niwa.co.nz/our-science/freshwater/tools/shmak/summary>

17. IWI ESTUARINE TOOLKIT

The main objectives of the Nga Waihotanga Iho (what is left behind, lift up), the estuary monitoring toolkit for iwi, is to empower tangata whenua in the resource management decision-making process; provide easy-to-use inexpensive and robust tools for tangata whenua and community groups to monitoring environmental changes in their estuaries; and provide an educational resource for high-school students.

Estuaries are valued by tangata whenua: as a source of identity; to support mana and wairua of the iwi; for learning and custom, traditional knowledge; as Turangawaewae – a source of health; as a place of beauty and spirituality, connection with Tangaroa; as a source of kaimoana to share with guests and for special occasions; for recreation with hap /whanau; for commercial value and employment (Richards & Swales 2009 – coastal society newsletter).

Like the SHMAK and CHI, the estuarine toolkit is founded on scientific principles and tangata whenua values. The toolkit is comprised of seven modules: habitat mapping, sediments, water and sediment quality, plants, fish, shellfish, and coastal management. This was to relate to the physical, chemical and biological aspects of estuaries. The toolkit manual provides step-by-step description of methods for each module. The toolkit was field trialed in February 2009 at Manaia estuary on the west coast of Coromandel Peninsula, working with participants from Ng ti Whanaunga, Ng ti Pukenga and Coromandel Area School. The participants underwent training with NIWA staff in order for them to conduct future assessments independently.

Reference

NIWA. (n.d.). *Ng Waihotanga Iho - Estuarine Monitoring Toolkit for Iwi*. Retrieved from <http://www.niwa.co.nz/our-science/te-kuwaha/research-projects/all/ngA-waihotanga-iho-a-iwi-estuarine-monitoring-toolkit>

NIWA.(n.d). News: *Field trials of an estuary-monitoring toolkit for M ori*. Retrieved from <http://www.niwa.co.nz/publications/wa/vol17-no1-march-2009/news-field-trials-of-an-estuary-monitoring-toolkit-for-m%C4%81ori>

18. CULTURAL FLOW PREFERENCE STUDY

A Cultural Flow Preference Study, is a method that has been developed for Tangata whenua to assess their opportunities to engage in a range of cultural experiences in a catchment under differing stream flows. The process was applied in the Kakaunui River and enabled Tangata whenua to identify their flow preferences, together with the dependencies of a number of cultural values and uses on specific flows at a particular time of year. The results suggested that the current flow regime, which only prescribes a minimum flow, is unsatisfactory. A number of flow related issues that can be only investigated as part of a collaborative investigation involving bio-physical scientists and Maori were also identified.

Table 2: A summary of the process to incorporate the cultural interests of Maori in setting determining flow regimes

Step	Objective of step and application in the case
1. Initiating the project	To identify the body representing Maori and secure mandates
2. Documenting the association	<ol style="list-style-type: none"> To identify the multiple dimensions that collectively represent cultural association with the study area To identify the attributes used to assess whether environmental flows are sufficient to sustain cultural interests To examine how their experiences are impacted by aquatic conditions, in particular river flow To document perceptions of changes to flow patterns over time, and the impact of these changes on cultural values.
3. Cultural Opportunity mapping	<ol style="list-style-type: none"> To identify the cultural values associated with specific sites, together with the opportunities sought at each site given the values identified. To formulate a catchment wide concept map that visually depicts water management issues (including flow) perceived by Maori as impacting their experiences at the sites identified. Interrelationships between issues are also mapped
4. Focusing the investigation	<ol style="list-style-type: none"> To critically review the data collected and to focus on environmental flows and specific flow issues affecting the waterways being investigated To distinguish between 1) cultural values, opportunities, and issues to be evaluated as part of existing EFAs; 2), cultural values, opportunities, issues (and consequently flow attributes) that are place specific but could be addressed within an existing EFA; 3) those cultural values, opportunities, issues and flow attributes that were unlikely to be adequately addressed via existing EFA methods and are more appropriately addressed through a cultural assessment
5. Cultural Opportunity assessments	<ol style="list-style-type: none"> To undertake assessments at sites to assess whether environmental flows sustain cultural values and provide the opportunities sought To assess each site under different flow conditions using the attributes previously identified by Maori <p>Assessors assess</p> <ul style="list-style-type: none"> Significance – the significance of each attribute at that particular site. satisfaction – whether or not they were satisfied that the flow being observed sustains the attributes associated with the cultural values at that particular site. <p>A rating of 1-7 is given by Maori assessors for all flow attributes at each site (1 being totally satisfactory, 7 being totally unsatisfactory). For each <u>attribute</u> the individual ratings are averaged producing a single 1-7 score. Then the flow attributes within each <u>theme</u> are averaged - for example the nine attributes scores for the mahinga kai component are averaged. The output is a single score for each of the four themes. These averaged scores can then be directly compared with recorded flows for the time/date of assessment. By examining the data for all nineteen attribute scores, attributes that contributed to the level of satisfaction/dissatisfaction at the flows observed are identified.</p>
6. Analysis to inform decision making	Qualitative analysis and statistical analysis to identify flow thresholds, flow related issues, and management priorities.

Analysis of the matrices and the graphs allow Tangata whenua to not only identify flow thresholds (that help determine one of the characteristics of an environmental flow) but also the attributes of concern, that tangata whenua want to see addressed when setting

the flow regime. The analyses are intended to progress beyond descriptions of how indigenous communities attribute meaning to water (Langton 2002; Toussaint et al. 2005) to an understanding of how river flows impact these meanings and associations. For example, an attribute that rated poorly and contributed to the low Wai Maori rating was the unnatural presence of weed and algae. Another attribute that scored poorly was the build-up of gravel and sediment, which detracted from the river amenity and utility at low flows. Both of these attributes can be ameliorated by higher flows that would flush both nuisance weeds and sediment from the channel.

Another example concerned low spring–autumn flows which were seen to limit the width of the wetted area within the river channel. Whanau commented that the connections to some tributaries and riparian habitats were broken or were at risk of being broken in contrast to the connections observed historically.

Flow conditions impact cultural use of the site, and ultimately how whanau felt about the site. As Tangata Kaitiaki (mandated guardians / monitors representing whanau, hapu and iwi), it is important that Maori feel proud of the condition of sites that are available for whanau, stakeholders, and communities to engage with. Having identified the cultural preference for the minimum flow, the minimum sought by other stakeholders and the recommendations of EFAs.

Recording forms

Forms are included as [Appendix 4](#)

Reference

Tipa, G. Nelson, K. *Identifying Cultural Flow Preferences: The Kakaunui River Case Study where Manawhenua identified their flow preferences* (forthcoming Journal of Water Resources Planning and Management)

19. RIVAS

The Foundation for Research Science and Technology funded three short-term Envirolink projects designed to develop a ‘useable’ system for regional councils to prioritise in- and out-of-stream river values in New Zealand. The five main phases to the overall project (i.e. the three projects) are:

- A national planning workshop to agree on values to be worked on, host councils, timeline, etc.
- A significance assessment method for defining river values, and associated agreed set of terms.
- Application of the method to salmonid angling to provide a template.

- Application of the method (with reference to the salmonid angling template) to the other river values at targeted host councils.
- Production of a set of guidelines and case examples to be supplied to all councils in New Zealand.

One case study was based in and provided guidance for parties (iwi, Councils) wanting to apply the method in order to assess tangata whenua river values. However, rather than simply defining significance thresholds for application within national and regional planning under the RMA, the challenges of according significance from a cultural perspective are also discussed. To this end, the modified method outlined in the report established criteria to assess the total river value from a tangata whenua perspective.

The case study report did not:

- Identify thresholds for individual taonga or individual sites to rate their individual significance within a river system.
- Outline a means to determine whether a river is nationally, regionally or locally significant.

Recording forms

Forms are included as [Appendix 5](#)

Reference

Hughey, K.F.D., Baker, MA. (eds). (2010a). *The River Values Assessment System: Volume 1: Overview of the Method, Guidelines for Use and Application to Recreational Values*. LEaP Report No.24A, Lincoln University, New Zealand.

Tipa and Associates (2010) *Consideration of a Significance Assessment Method for Tangata Whenua River Values A Murihiku* Report for Lincoln University.

20. MAURI OF WATERWAYS KETE

Jefferies and Kennedy (2009) developed a kete of environmental indicators and outcomes for mauri of waterways, mana whenua and waahi tapu specific to statutory plans. The M ori Outcomes and indicators framework and methodology kaupapa was developed over five years, to provide an effective suite of tools with which iwi/hap can use to evaluate and assess the performance of councils in relation to their obligations under the RMA 1991 and Local Government Act 2002 from a M ori perspective. These were developed to align with environmental outcomes under the RMA and Local Government Act, and those of the wider community.

As mentioned above, the maintenance, protection and restoration of mauri is a cultural and spiritual responsibility of kaitiaki M ori (Jefferies and Kennedy 2009). The mauri of waterways outcomes and indicators kete (toolkit) was intended to provide tangata

whenua a suite of tools to judge whether the mauri of waterways within their rohe is in good health; and to understand the contribution councils and Crown agencies make in achieving this goal.

The Mauri of Waterways kete and other kete developed has a multi-level structure

Framework/Structure	Explanation
Kaupapa	Overarching principle
Tikanga	High-level principle/rule which must be obtained and upheld
Outcome	A single expression of a group's ideal result for a particular tikanga
Indices	A series of indicators grouped by theme
Indicators	The high-level enquiry for evaluating whether outcomes are being achieved
Measures	Lower-level enquiry or method, several of which collectively provide the information required for an indicator. Each measure is scored on a scale of 1 (best) to 5 (worst)

Table 2. Summary of M ori environmental outcomes and indicators for Mauri kete.
(Source: Jefferies & Kennedy 2009b).

Outcome: Mauri of all waterways are in optimum health
 Kaupapa: Mauri
 Tikanga: Mauri of Water

Indices:	Indicators:	Measures (Some examples):
1. Extent to which local authorities protect mauri	1. Whether respondent agrees that Territorial Local Authority actively protects mauri 2. Whether Territorial Local Authority documents contain provisions to protect mauri 3. Whether Territorial Local Authority act to protect mauri	"Strongly agree" to "Strongly disagree" scale 4 measures 4 measures
2. Extent to which tangata whenua protect mauri	1. Whether respondent agrees that tangata whenua actively protect mauri 2. Whether tangata whenua have management documents with provisions designed to protect mauri 3. Whether tangata whenua act to protect mauri	"Strongly agree" to "Strongly disagree" scale 1 measure 4 measures
3. Extent to which other agencies protect mauri	1. Whether respondent agrees that other Government agencies actively protect mauri. 2. Whether agency takes measures to foster understanding of mauri. 3. Whether agency has strategies designed to protect mauri.	"Strongly agree" to "Strongly disagree" scale 1 measure 1 measure

4. Extent to which actions of the wider community affect mauri.	1. Whether respondent agrees that actions of the wider community affect mauri.	"Strongly agree" to "Strongly disagree" scale
	2. Extent to which individuals and groups are informed about mauri and how it should be protected.	1 measure 1 measure
	3. Whether individuals and groups take active measures to protect mauri.	
5. Physical evidence that mauri is protected.	1. Whether respondent agrees that mauri is protected.	"Strongly agree" to "Strongly disagree" scale
	2. Characteristics of the water.	
	3. Characteristics of the waterway and its immediate environment.	7 measures 4 measures
	4. Characteristics of waterway inhabitants.	3 measures 2 measures
	5. Presence of potential human threats.	

Reference

Integrated Kaipara Harbour Group (IKHMG) (n.d). *The World of Kaipara. Information Review & Gap Analysis. Chapter 11. Restoring the Mauri of Kaipara.* Retrieved from <http://www.kaiparaharbour.net.nz/Content/Publications/Chapter11RestoringthemauroftheKaipara.pdf>

Jefferies, R; Kennedy, N 2009a. *A Report to Iwi on the PUCM Kaupapa M ori Environmental Outcomes and Indicators Framework.. PUCM M ori Report 8*

Jefferies, R; Kennedy, N 2009b. *PUCM M ori Report 2. Ng Mahi: Kaupapa M ori Outcomes and Indicators Kete.. PUCM M ori Report 2*

22.ASSESSING THE PROPERTIES OF WHENU AND WHITAU HARVESTED BY WHANAU

Dr Carr and Rua McCallum have undertaken assessments of harakeke to assess the condition of the whitau found in cultivars. The process assesses the physical and chemical properties (by Dr Carr) alongside a Kaupapa Maori assessment of its properties to Maori weavers (Rua McCallum).

The information can be used by Tangata whenua to guide their restoration endeavours.

Reference

Clothing and Textile Centre (April 2009) *Selected properties of whenu and whitau harvested from the Waitaki* University of Otago

3.0 A summary of indicators used in the various tools

Where possible we have included the recording forms used by Tangata whenua when applying the cultural monitoring tools. We have also compiled a list of indicators used across all the tools described in section 2.

Cultural Health Index (CHI)
State of the Takiwa
Mauri Model (Kepa)
Kaitaki Tools (NIWA)
Practical tools for iwi and Maori organisations (Kaupapa.org)
Cultural Health Index (Te Tau Ihu)
Iwi Estuarine Indicators (Te Tau Ihu)
Indicators for wetlands - Cultural component
Report cards - Waikato Independent scoping study
Iwi Estuarine Toolkit (NIWA)
River values assessment system (RIVAS) - Tangata whenua
Mauri of waterways (Kete)
Te rooroa iwi cultural indicators
Murihiku Kanakana
State of environment 2010 - Environment Southland
Cultural health assessment (CHA) - Waiau River
CHA - Avon and Heathcote
CHA - South Island waterways
CHA - Mataura and Waikawa rivers
CHA - Wairewa / Lake Forsyth
CHA - Waihora
CHA - Ashburton lakes
CHA - Hurunui
Waikawa kanakana research
Kereru Monitoring (Banks Peninsula)
Customary fishing records and Marine CHI (South Island)
Waimea River monitoring
Waimea cultural reserve
Tangata whenua environmental indicators for wai (Maitai River Nelson)
Cultural Health Indicators for Freshwater (Motueka and Riwaka Rivers)
Wakapuaka River cultural health indicators (see Cultural indicators for freshwater)
Monitoring Taonga species (Te Atiawa - Lower Hutt)
Taonga species inventory (Te Atiawa - Lower Hutt)
Shellfish monitoring (Foxton Coastline)
Catchment monitoring (Otaki Catchment - Horowhenua)
Mangapouri Stream Research and restoration
Waitohu Stream Annual Monitoring program
Ngati Raukawa Tuna monitoring plan project (Manawatu)
Pataka Whata (Taranaki)
Nga Kaitiaki o Te Awa o Ngaruroro (Ngaruroro River)
SEV Monitoring of Nguarororo River
Te Karamu Restoration Liaison
Ahuriri eco toxicology (Ahuriri and Porangahau Estuary)
Operation Patiki (Hastings)
Chadwick Trust (Kohupatiki)
Genetic Engineering Monitoring (Tainui Kirikiroua)
Coastal Cultural Health Index (Te tai Tokerau, Patuharakeke, Ngai ti Rehia)
Kaitiakitanga o te Kukupa (Motatau State Forest)
Eel fishery assessment in Kawakawa (Taumarere)
Tuna population survey of Lake Omapere and Utakaura River
Te Whakatikaina Tangaroa (Whaingaroa Harbour)
Pouto Lakes Eel Survey
Kaipara Harbour Scallop Survey
Te Uri Hau Oyster Reserves Survey (Kaipara Harbour)
Meridian Energy Resource consent application (Pouto Penninsula)
Matauranga Kura Taiao (Takahiwai)
DMP statistics - Pipi survey (Bream Bay, Marsden Point)
Cockle Reseeding Whangarei Harbour (Takahiwai)
Seagrass Translocation Whangarei Harbour (Takanuiwai)
Coastal Cultural Health Index (Bream bay, Whangarei Harbour)

[illegible][illegible]

[illegible]

[illegible]

Table sources:

1. Detail Summary references
2. Chetham, J. Newell, A. Nuttall, P. Shortland, T. REPO Consultancy Ltd. (2010). *Maori Cultural Environmental Monitoring Stocktake*. Prepared for the Ministry for the Environment. New Zealand:REPO Consultancy Ltd

Tool	Authors / Organisations involved	Area of application (Marine / Land / River / Lake etc)	Who applies the tool (Manawhenua, Scientists, Combination)	How is it applied (Observations, Samples collection)	Type of data collected (Site survey, Photographs, Samples - Scientific testing)	Objectives	Components / Aspects of tool	Examples of its use	References
Cultural Health index (CHI)	Gail Tipa Laurel Teirney MFE (Ministry for the Environment) Ngai Tahu Te Runanga Otakou Te Runanga o Moeraki Te Runanga o Arowhenua Ngati Kahungunu	Streams and Waterways	Maori	Site observations done by a group in the field using an assessment form Interviews with individuals / hui	Site survey Photographs Electric fishing (Fishing data) Interviews with Maori	A tool so Maori can assess and manage waterways in their area by giving Maori the opportunity to assess the cultural and biological health of a stream or catchment of there choosing	Component 1: Site status - Assessment if site is traditional or not Component 2: Mahinga kai - Species present, Productive capacity, Comparison between species present today and in the past, Assessment if Maori would return to site Component 3: Cultural stream health - Eight individual indicators which were found to best describe how Maori assessed overall stream health.	Taieri Catchment Kakaunui Catchment Hakaterere Catchment Tukituki Catchment Other Maori have used the CHI as the basis for their own assessment	Ministry for the Environment. (2006). <i>Using the Cultural Health Index: How to assess the health of streams and waterways</i> . Retrieved from http://www.mfe.govt.nz/publications/water/cultural-health-index-for-streams-and-waterways-feb06/chi-for-streams-and-waterways-feb06-full-colour.pdf
State of the Takiwa	Craig Pauling (Ngai Tahu) Ngai Tahu NIWA	Significant sites Natural resources General environment	Maori Scientists	Site observations / fieldwork by group in the field using assessment form and equipment Samples collected for ecolli testing	Site survey Photographs Electric fishing (Fish data) Water samples SHMAK kit data CHI data	A cultural based environmental monitoring and reporting system for Maori to assess cultural health of their takiwa so they can have "robust and defensible information" on environmental health to be used internal and/or externally	The main component of SOTT (State of the Takiwa) is the site assessment done by tangata whenua. This assessment consists of varies forms done in the field including Site definition (Overview of site, Historical), Visit form (Weather, Archeological), Site Assessment (Species present, Modification) Other tools within the SOTT include: - CHI assessment - Ecoli testing - Electric fishing	Avon - Heathcote Estuary and catchment Waiau River Various sites in South Island Mataura and Waikawa Rivers Wairewa (Lake Forsyth) Waihopai, Oreti Rivers (Add Estuarine) Te Waihora / Lake Ellesmere Otuhwerekai / Ashburton Lakes including Rangitata, Hakaterere and Rakaia rivers (Add Hurunui River including Hoka Kura / Lake Sumner (Adds Fyke net surveys)	Pauling, C. Lenihan, Te Marino. Rupene, M. Tirikatene-Nash, Nukoroa. Couch, Rewi. (2007). <i>State of the Takiwa: Cultural Health Assessment of the Avon-Heathcote Estuary and its catchment</i> . Chetnam, J. Nuttel, P. Shortland, T. Newell, A. (2010). <i>Maori cultural environmental monitoring stock take</i> . Prepared for Ministry of the Environment.
Mauri Model	Te Kipa Kepa Brian Morgan (University of Auckland)	All of the environment	Maori Community Scientists Consultants / Experts	Technical analysis (i.e. economic) Interpretation of concepts / Maori values by Consultants / Maori	Spreadsheets Literature review	A tangata whenua assessment "to determine if an option is identified as enhancing, diminishing, or neutral for the mauri of each aspect concerned" Tangata whenua assessment of the long term viability and sustainability of an option	The Mauri model consists of four main components for analysis which are rated from 4 (Viable practice), 2 (neutral) and 0 (significantly diminishing mauri and unsustainable). These scores are also weighted based upon tikanga and upon there relation to the environment. The four components include: 1. Mauri of the environment = Integrity of the ecosystem 2. Mauri of hapu = Integrity of cultural identity 3. Mauri of the community = Well being of society 4. Mauri of whanau = Economic analysis	Application in relation to the provision of urban infrastructure alternatives within sub growth region	Te Kipa Kepa Morgan, Brian. (2004). <i>A tangata whenua perspective on sustainability using the mauri model: Towards decision making balance with regard to our social, economic, environmental and cultural wellbeing</i> . International Conference on sustainability engineering and science. Morgan, K. (2003). <i>The sustainable evaluation of the provision of urban infrastructure alternatives using the tangata whenua mauri model within the smart growth sub-region</i> . Technical report, Mahi Maioro Professionals.
Kaitiaki Tools	NIWA	Freshwater	Maori Scientists	Using the interactive online guide so Maori can assess the possible environmental issues related to an activity or industry	A variety of differing amount of data can be collected by primarily scientists as the guide provides a possible list of data to collect	To teach Maori who are involved with the resource consent process by listing the possible environmental effects from a proposed activity or industry, possible effects on mahinga kai / freshwater species and a brief background on resource consent process including how to prepare a submission	Kaitaki tools consists of four general components with multiple sub components. They include: 1. Proposed activity or industry = Agriculture, Wastewater treatment 2. Impacts = Chemical contamination, Nutrient overloading 3. Mahinga kai species = Tuna, Inanga 4. Resource consent process = RMA, Consent process	NIWA. (n.d). <i>Kaitaki Tools</i> . Retrieved from http://www.niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools on April 2012	
Practical tools for iwi and Maori organisations (Kaupapa.Org)	Sasha McMeeking	Iwi and Maori organisations	Individuals from Iwi and Maori organisations	A variety of tools are used so its application differs depending on the tool used. Examples include financial analysis of an organisations operation or environmental issues in relation to its operation	Interview with individuals within or involved with iwi or Maori organisation Literature review Technical analysis (Studies)	To help Iwi and Maori organisations promote there kaupapa through: - Organisations operations - Measuring and monitoring tribal programmes - Ensuring organisations activities remain consistent with kaupapa values and priorities	The kaupapa model consists of three groups of tools. Each group has differing amount of detail with some groups referring to how to adapt and/or to take into consideration other existing frameworks or giving an detailed tool to use. The three groups include: 1. All organisations = This group discusses in general kaitakitanga, accountability and participatory processes and human resources management. Within this discussion it describes how to adapt or take into consideration other standards and practises available. 2. Commerical operations = A variety of tools are used with some specific examples with indicators. These include models for contributing to the kaupapa (e.g. Simple financial contribution), screening of investment based on kaupapa principles and policies, Kaupapa outcomes targets (Asset Allocation framework), Multitpliers within Tribal and Maori Economics, Multiple bottom line evaluation (Detailed tool here) and Trade off modeling (e.g. Ecosystem modeling) 3. Tribal programmes: Kaupapa indicator bank and Kaupapa indicator survey		McMeeking, S. (n.d.). <i>Practical tools for Iwi and Maori organisations - kaupapa.org</i> . Retrieved from www.kaupapa.org
Cultural Health Index (Te tau ihu / Whakatu)	Tangata whenua ki Whakatu Tasman District Council Ministry for the Environment (MFE) Tiakina te Taiao	Streams, Waterways and Estuaries	Maori	See CHI	Site survey (Form and guide) Photographs Fish sampling (Electric, Spot et Tiakina te Taiao GIS Drawings (If artifacts found) Comments and recommendations for improvement, ideas for additional indicators, action points	It provides a holistic Maori perspective of stream and river health and gives iwi/hapu a tool to express their cultural values of stream health and mahinga kai for planning, policy and decision-making	Te tau ihu use an adapted version of the CHI (Tipa & Teirney) in their assessment. It incorporates the concept of Nga Atua Kaitiaki where the indicators within the CHI are grouped in the atua domains (Tumatauenga,Tangaroa, Tane Mahuta, Haumie tiketike, Tāwhirimātea and Ora) and they have added a GIS data collection component (Tiakina Te Taiao's GIS) The Tiakina Te Taiao's GIS incorporates data collected from the site assessment. This includes maps, aerial photos, precise grid coordinates or GPS coordinates and the indicator data.	Motueka Catchment Riwaka Catchment	Ministry for the Environment, Tasman District Council. (2007). <i>Cultural Health Index for Reservoir Creek</i> . Retrieved from www.tasman.govt.nz Young, Roger. Harmsworth, Garth. Walker, Dean. James, Trevor. (2008). <i>Linkages between cultural and scientific indicators of river and stream health: Motueka Integrated Catchment Management (Motueka ICM) Programme Report</i> . Retrieved from http://icm.landcareresearch.co.nz/knowledgebase/publications/public/Cultural_indicators_report2.pdf

Iwi estuarine indicators	Tiakina te Taiao (Dean Walker) Te Huriā Matenga Wakapuaka Trust Nelson City Council Landcare Research Manaaki Whenua	Estuaries	Maori	See CHI	Site survey (Form and guide) Photographs Drawings (Artifacts found) Comments and recommendations for improvement, ideas for Tiakina te Taiao GIS	Create a tool for developing cultural input, assessment and advice into future state of the environment reporting for decision making in relation to estuaries	This tool is based around concepts within the CHI (Tipa and Teirney) and the CHI (Te tau ihu). It was created through a series of hui and site visits by a Maori involved in the process. From this process a draft monitoring form was created and tested in a variety of sites across the estuary and using a variety of methods (Group and individual) so to make it applicable across a range of estuaries. An updated monitoring form was developed from this testing and applied in a variety of sites selected by iwi. The final form and the how it is applied is similar to CHI (Te tau ihu) with some modification because its being applied to an estuary i.e. Estuarine vegetation. By doing this the data collected can be entered into the Tiakina te Taiao GIS like the CHI (Te tau ihi).	Wakapuaka Estuary	Walker, D. (2009). <i>Iwi Estuarine Indicators for Nelson</i> . Retrieved from http://www.envirolink.govt.nz/PageFiles/425/628-nlcc31.pdf
Indicators for wetlands - Cultural component	Garth Harmsworth	Wetlands	Maori	Site assessment form	Site survey	A generic set of indicators based upon matauranga Maori based for wetland condition and ongoing trends within the wetland	This tool was created using information collected from a variety of sources including past literature and interviews with Maori. From this process a list of indicators was created based upon Maori concepts and values and incorporated into a monitoring form so Maori can assess wetlands. The monitoring form has three components: - Whats causing the problem? (Degree of modification, No. of point sources of pollution degrading te mauri etc) - Taonga and Maori (Number of taonga species in wetland, % of taonga plants in wetlands etc) - Trends/Change/wetland getting better or worse (Change in % area of taonga plants with total wetland area etc) - Other comments on wetland		Harmsworth, G. (2010). <i>Coordinated Monitoring of New Zealand Wetlands, Phase 2, Goal 2: Maori environmental performance indicators for wetland condition and trend - A Ministry for the Environment SMF Project – 5105</i> . Prepared for Ministry of the Environment. Retrieved from http://www.landcareresearch.co.nz/publications/researchpubs/harmsworth_monitoring_wetlands.pdf
Report cards - Waikato Independent scoping study	Ministry for Environment NIWA	Rivers Lakes	Maori Scientists	Information is collected from a variety of sources (Past research, monitoring, interviews etc) and used in the report card scoring system It required information is unavailable its status is listed i.e. Research underway	Literature review Interviews Research (Past, ongoing, required)	Report Cards are used track the progress of restoration by summarising and assessing a variety of environmental, policy, and management conditions	This tool collates a variety of data into a report card framework to aid in the restoration process. It breaks down this information into a selection of indicator tables then scores each indicator from A to F based specific targets. This framework consists of both action and state indicators and was created to be used in any part of the Waikato River and lakes. The action indicators describe the status of a particular restoration action and complement state indicators. These can be used to audit actions. The state indicators are the ultimate indicators of restoration but are affected by time lags, subject to high natural variability and long term trends may take time to detect	Waikato River Waikato Lakes	NIWA. (2010). <i>Waikato River Independent Scoping Study</i> . Retrieved from http://www.mfe.govt.nz/publications/treaty/waikato-river-scoping-study/appendix-30-reportcards.pdf
Iwi estuarine toolkit	NIWA North Island iwi on both east and west coast (Ngāti Whanaunga, Ngāti Pukea)	Estuaries	Maori Scientists	Field assessment done by hapu and community groups (Assisted by scientists) Also can be used as a educational resource for secondary school	Site assessments Could possibly be scientific testing	Estuary monitoring toolkit for Iwi, has been developed to provide tangata whenua with tools to measure environmental changes in their estuaries.	Toolkit to help tangata whenua measure and monitor environmental changes in their estuaries using sound science principles and is firmly underpinned by Māori values Toolkit consists of a series of modules: - habitat mapping - sediments - water and sediment quality - plants - fish - shellfish	Manaia Harbour	NIWA. (n.d.). <i>Ngā Waihotanga Iho - Estuarine Monitoring Toolkit for Iwi</i> . Retrieved from http://www.niwa.co.nz/our-science/te-kuwaha/research-projects/all/nga-waihotanga-iho-a-iwi-estuarine-monitoring-toolkit NIWA.(n.d). News: <i>Field trials of an estuary-monitoring toolkit for Māori</i> . Retrieved from http://www.niwa.co.nz/publications/wa/vol17-no1-march-2009/news-field-trials-of-an-estuary-monitoring-toolkit-for-m%C4%81ori
River values risk assessment (RIVAS)	Ken Hughey (Lincoln University) Kay Booth (Lindis Consulting) Mary Anne Baker (Tasman District Council)	Rivers and surrounding areas	Variety of groups including Maori, Recreational user groups, Councils, Irrigators	Uses a combination of an: A multi criteria driven, standardised numeric scale approach An expert panel based approach	Creation of an assessment criteria and then determination of significance of varies criteria Use of expert panel and relevant data available to determine significance	To outline an explicit and standardised method to develop assessment criteria and significance thresholds for multiple in and out of river values. The method can be applied to national and regional planning under the RMA.	RIVA consists of three main components: Part 1: Assessment criteria - Step 1: Identify attributes - Step 2: Select and describe primary attributes - Step 3: Identify and apply indicators Part 2: Determination of significance - Step 4: Apply significance threshold - Step 5: Determine significance - Step 6: Outline other factors relevant to assessment of significance Part 3: Method review - Step 7: Identify information requirements	Salmonid angling – Tasman District Council and Marlborough District Council Irrigation – Canterbury Regional Council and Tasman District Council Native birdlife – Canterbury Regional Council and Tasman District Council Whitewater kayaking – West Coast Regional Council and Tasman District Council Swimming – Manawatu Wanganui Regional Council and Tasman District Council Natural character – Marlborough District Council and Tasman District Council Tangata whenua – Southland Regional Council Hydro – Bay of Plenty Regional Council and Tasman District Council Native fisheries – Wellington Regional Council	Hughey, K.F.D., Baker, MA. (eds). (2010a). <i>The River Values Assessment System: Volume 1: Overview of the Method, Guidelines for Use and Application to Recreational Values. LEaP Report No.24A</i> , Lincoln University, New Zealand. Retrieved from http://www.lincoln.ac.nz/research-centres/leap/environmental-management-planning/projects/prioritising-river-values/
Mauri of waterways (Kete)	Integrated Kaipara Harbour Group (IKHMG)	Waterways	Iwi / Hapu	Assessment done by iwi / hapu	Direct iwi knowledge / assessment	Kete (toolkit) was intended to provide tangata whenua a suite of tools to judge whether the mauri of waterways within their rohe is upheld in good health; and to understand the contribution councils and Crown agencies make in achieving this goal	Mauri of Waterways kete and other kete developed has a multi-level structure: Kaupapa: Overarching principle Tikanga: High-level principle/rule which must be obtained and upheld Outcome: A single expression of a group's ideal result for a particular tikanga Indices: A series of indicators grouped by theme Indicators: The high-level enquiry for evaluating whether outcomes are being achieved Measures: Lower-level enquiry or method, several of which collectively provide the information required for an indicator. Each measure is scored on a scale of 1 (best) to 5 (worst) The outcome is the mauri of all waterways are in optimum health, which is measured through five indices (Extent to which local authorities protect mauri, Extent to which tangata whenua protect mauri, Extent to which other agencies protect mauri, Extent to which actions of the wider community affect mauri, Physical evidence that mauri is protected) and associated indicators	Ngāti Maru in Hauraki Ngāti Whanaunga in Hauraki Ngāti Awa in Whakatane	IKHMG. (n.d). <i>The World of Kaipara. Information Review & Gap Analysis. Chapter 11. Restoring the Mauri of Kaipara</i> . Retrieved from http://www.kaiparaharbour.net.nz/Content/Publications/Chapter11_RestoringthemauroftheKaipara.pdf

Maori methods and indicators for marine protection	Ngati Kere research team [Alan Wakefield, Lisa walker, Phyllis Tichinin, Maureen Wakefield, Mitarina Tipene, Mirianna McGregor] with technical support and assistance provided by Envirostate and staff of the Department of Conservation and the Ministry for the Environment.	Marine / Estuarine	Maori	Assessment done by iwi / hapu	Iwi knowledge Field assessment	Ngati Kere strive to sustain the mauri of the rohe moana through Tikanga Maori practices	<p>Traditionally Maori have used tohu to gauge, measure or indicate change in the environment. They have also been used to determine the time to harvest.</p> <p>This concept has been adapted by the Ngati kere research team into a selection of commonly used indicators through the use of interviews with hapu individuals, tikanga wananga, hui, historical recordings, and Te Taiapure o Porangahau coastal archives.</p> <p>It uses a selection of tohu or indicators to measure regularly the health of environment to assess trends or changes.</p> <p>These are used aswell to determinine whether the environment is getting better or worse.</p> <p>These tohu include: A: Traditional tohu Hauora/health - Mussel observations, Karengo observations, size, colour and amount of kaimoana, observation of happy and healthy people Mahinga kai/ harvest - Covered with sand, Moon phases, Kowhai bloom, Karaka berry, Birds, Seasonal fishing, Rain, Star constellations B: Contemporary tohu - Sediment level in rivers, Change in sand dune plant cover, Commerical fisheries, Strength and discolouring in shells, Poaching, Streamside vegetation, Human presence</p>	Te Angiangi Marine Reserve Te Taiapure o Porangahau Ngati kere rohe moana	Department of Conservation.(2005). <i>Ngati Kere interests and expectations for the rohe moana</i> . Retrieved from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-protected-areas/maori-methods/ngati-kere-interests-and-expectations-for-the-rohe-moana/
Te roroa iwi cultural indicators and monitoring framework	Te roroa Based upon Te Raukawa indicators from the Ngāti Raukawa Otaki River and Catchment Iwi	Environment	Maori	Assessment done by iwi / hapu	Iwi knowledge Field assessment	Monitoring of their environment must be fully integrated with monitoring the health of Te Roroa iwi as people and as a culture.	<p>Indicators have been developed under four themes:</p> <ol style="list-style-type: none"> 1. Whenua/ngahere - number of kukupa sustainably harvested from our forests for cultural purposes 2. Awa – number of rivers in our rohe that are classed as pristine 3. Moana <ul style="list-style-type: none"> - number of people commercially employed sustainably harvesting toheroa - number of marae able to provide sustainably harvested paua to manuhiri 4. Hapū - the ability of hapū to access materials and kai of cultural importance <ul style="list-style-type: none"> - the rate of change of consumption and preparation of traditional plant and animal foods and medicines by Te Roroa - extent of practice or use of karakia, wananga, powhiri, whakatau, rahui,and other oral traditions related to the use of traditional foods and subsistence practices - preservation and continued use of te reo o Te Roroa, songs, stories and ceremonies, traditional names for places, sites, foods and processes and the rate of change and factors affecting these practices - integrity of and access to sacred sites - rate of rural-to-urban or urban-to-rural migration of Te Roroa - number of occasions that Te Roroa whanau, hapū members and representat 	Te Roroa cultural indicators and monitoring framework is underway	IKHMG. (n.d). <i>The World of Kaipara. Information Review & Gap Analysis. Chapter 11. Restoring the Mauri of Kaipara</i> . Retrieved from http://www.kaiparaharbour.net.nz/Content/Publications/Chapter11RestoringthemauroioftheKaipara.pdf

4.0 Other Initiatives by Tangata Whenua to enable M tauranga M ori to inform Resource Management

In addition to monitoring activities Tangata whenua have a number of other initiatives underway. Some of these are summarised in this section.

Resource inventories

Harmsworth (2002) describes inventories as a “stock take” of tribal resources”. The concept of resources encompasses “people, natural resources, and economic assets” or more specifically:

- **Human/Social:** understanding human resources, people resources, human capital, human capacity, human capability, he tangata he tangata.
- **Cultural:** understanding cultural resources, cultural vibrancy, cultural integrity, M ori values, tikanga M ori.
- **Physical:** understanding physical resources, natural resources, access to natural resources, physical state and condition, land and coastal characteristics, condition, and use, mana whenua, awa, moana, etc.
- **Economic:** understanding available economic resources, economic capital, investments, and economic potential.

Many wh nau, hap and iwi are in the process of preparing inventories. Some have progressed to the development of GIS (Geographic Information Systems) and computerised databases. Some inventories, although the project has been initiated by tangata whenua, attract external funding. There are other examples where an agency has sought to develop an inventory of resources significant to tangata whenua to facilitate more effective communication e.g., some forestry companies, and Transit NZ.

Iwi Plans

Iwi management plans provide a ‘window of insight’ into the aims and aspirations of the iwi, and an opportunity to minimise confusion, uncertainty and ignorance at this interface (Matunga, H 1992)

Iwi/hap Management Plans (IMP) are planning documents that consolidate iwi knowledge on resource management issues. Some IMPs address economic, social, political and cultural issues as well. IMPs’ provide a framework for the sustainable development of natural and physical resources by providing goals, and typically include a combination or all of the following: objectives, tasks, actions, indicators and measures. The Ministry for the Environment’s guide, Te Raranga a Mahi (BECA 2000), identifies several reasons why IMPs have been prepared. These include:

- to avoid reactive responses to resource management consent applications or issues and policies (including resource management plans) that affect iwi in a particular rohe;
- to clearly state iwi kaupapa on environmental issues;

- to enable whānau, hapū, iwi or Rōhanga to exercise their tino;
- Rangitiratanga over resources in their rohe;
- state how whānau, hapū, iwi or Rōhanga intend to participate in;
- resource management processes.

In relation to regional councils, section 66 of the Resource Management Act 1991 (RMA) states that when preparing or changing any regional plan, regional councils shall have regard to any relevant planning document recognised by an iwi authority affected by the regional plan. However, the scope of recognition is widened to apply in the processing of resource consents through policy provisions in many of the Regional Policy Statements. For example Policy 3.4.7(v) of the Auckland Regional Policy Statement which states:

"In relation to resource consents, the ARC and TAs shall take into account where relevant any planning document recognized by an Iwi authority affected by a resource consent."

Te Wai Mōri (2007) describes another potential planning document a: freshwater iwi management plan (FWIMP) as a specific type of IMP that deals, as the name suggests, with an iwi's interests in freshwater. A freshwater management plan might be a stand alone document (like Ngāi Tahu's 1999 policy on freshwater use) or incorporated as a section within a broader IMP. Te Ohu explain that an iwi freshwater management plan will seek to influence the decisions on both regional and district plans (which will need to "take account of" the FWIMP). The FWIMP will also be useful when making submissions on individual resource consent applications, regional pest management strategies (prepared by regional councils), Long Term Council Community Plans (LTCCPs) (prepared by all local authorities), conservation management strategies and reserve management plans (for public conservation estate) and similar documents prepared by public authorities

General comments on the existing iwi plans are as follows:

- The driver for the preparation of many iwi plans has been the enabling provisions of the RMA 1991 where resource managers are required to have regard to such plans.
- As a consequent of the RMA focus, the structure and content of many iwi plans follow the structure of statutory planning documents by setting out a vision, goals and policies.
- Preparing an iwi resource management plan is a major undertaking and whānau, hapū and iwi are justifiably proud of their endeavours and its output.
- Few plans provide specificity in the form of measurable targets, standards, rules – or in the context of flow setting - the flows in specific river reaches that are sought by Mōri. This may make it difficult for planners, river users and developers to understand what tangata want in relation to a specific context, a specific location, or a specific resource use. Without a comprehensive knowledge of tangata whenua values, the risk for misinterpretation between the parties exists.

- The plans seek to control inappropriate resource use and development but it is often implied that these uses and developments will be by “others”. It is not always clear how the plans which describe the environmental outcomes sought by tangata whenua accommodate or balance the social, economic and cultural aspirations of wh nau, hap and iwi when it is tangata whenua that is wanting to develop and use resources.
- As such the current iwi plans are focussing on achieving a limited range of outcomes for the environment. Although tangata whenua advocate for a holistic perspective, arguably the plans (prepared within the confines of RMA) do not reflect this by integrating social, cultural, economic and environmental aspirations of wh nau.

There are already resources (e.g., Guidelines, Resource Kete etc.) available for preparing iwi management plans to serve a function under the RMA.

Customary fisheries assessments - Since the enactment of customary fishing regulations in the both the north and south islands, a range of initiatives are underway to record customary fisheries data. Catch records are available from Tangata Tiaki and MFish. M tauranga M ori is being recorded to support applications for mataitai and/or taiapure, or is being recorded to inform management strategies of fisheries managers, including Tangata Tiaki.

Cultural mapping - Cultural mapping has been recognized by UNESCO as a crucial tool and technique in preserving the world's intangible and tangible cultural assets. It encompasses a wide range of techniques and activities from community-based participatory data collection and management to sophisticated mapping using GIS There are examples of tangata whenua undertaking mapping. Many of the approaches being adopted are participatory and encourage tangata whenua to identify, record, and investigate cultural assets – both tangible or intangible and that form the foundations of the culture. These assets, like resource inventories, could be organisational, human, social, tribal, corporate, natural or built environments:

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.

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

Poole (2003) describes his cultural mapping work, while guidebooks on participatory mapping techniques are found on the internet (e.g http://www.ifad.org/pub/map/PM_web.pdf).

Data that is collected can be represented through a variety of formats like geographic maps, graphs, diagrams, aerial photographs, satellite-produced images, statistical

databases, and others. But it is important for those working with tangata whenua that the formats they prefer are provided.

From this, a comprehensive view of cultural resources can be stored and the documented data will serve as invaluable information for the development of national strategies that engage in accurate and sensitive analysis of people, places, and environments. One of the contexts in which the outputs of cultural mapping can be of value is in flow assessments.

Oral histories - Oral histories are stories told by living people about the past. Generally, the stories are of their own life experiences and the lives of the people around them. Often an oral history includes details and stories that exist nowhere other than in the individual's mind. Therefore, preserving oral history and whānau stories should be a top priority for any Māori resource manager. Kaumatua, parents, aunts and uncles, and other whānau members represent a valuable information resource. Some whānau, hapū and iwi members have received training in how to question individuals, and others have sought guidance on the best means of recording the discussions and preserving them for future reference.

Cultural values reports - Cultural values reports (CVR) are variations of CIAs. These can be used in assessing or providing background information as they can identify and describe values of tangata whenua pertaining to a particular area or resource. They differ from CIAs in that they do not need to include a description of effects as they do not relate to a specific activity. However, if the author chooses and if sought by tangata whenua they may discuss high level impacts of a development occurring or anticipated in that area. Cultural values reports can provide direction as to the relevant issues and how these should best be addressed. They are useful for facilitating discussion.

The following webpage provides valuable information about Cultural values reports

<http://www.qp.org.nz/consents/cultural-impact-assessment.php>

Cultural impact assessments (CIA)

A CIA is a report documenting M ori cultural values, interests and associations with an area or a resource, and the potential impacts of a proposed activity on these. CIAs are a tool to facilitate meaningful and effective participation of M ori in impact assessment. A CIA should be regarded as technical advice, much like any other technical report such as ecological or hydrological assessments.

(Extracted from the Quality Planning website

<http://www.qp.org.nz/consents/cultural-impact-assessment.php>)

A CIA may:

- identify the effects of a proposed activity on M ori (tangata whenua) cultural associations with the environment;
- identify or assist identification and formulation of methods to avoid, remedy or mitigate adverse effects on cultural values and associations;
- suggest what conditions of consent could be applied if consent is granted;
- provide iwi/hap with comprehensive information about and improved understanding of the proposed activity;
- assist both the applicant and the council in decision-making under the RMA.

The assessment of impacts on cultural values, interests and associations can form part of the AEE that accompanies applications under the RMA. The need for a CIA can emerge from:

- initial planning and consultation involved in the development of a proposal for a new activity that requires resource consent;
- a request from the council for information;
- referral of the application by the council to tangata whenua.

The content and structure of a CIA differs between iwi/hap groups and with the nature and scale of the proposed activity. Generally, a CIA will include:

- description of the consultative processes used in preparing the report (hikoi, hui, tangata whenua interviews, reviews of technical documents, drift for tangata whenua to comment and sign off for the final CIA);
- a description of the proposed activity – which may be provided by the applicant;
- recognition of the mana whenua within the area subject to the application and a description of who the report is being prepared on behalf of;
- a brief overview of the relevant statutory planning framework;

- a description of the cultural values of tangata whenua associated with the site or the resource that is subject to the application;
- identification of impacts and evaluation of effects of a proposed activity on the identified cultural values;

A CIA may also include:

- recommendations to avoid, remedy or mitigate any adverse effects on M ori cultural values;
- recommended conditions of consent should the application be granted;
- iwi/hap expectations for 'where to from here' - the process following the CIA.

However, some wh nau, hap and iwi may choose to discuss mitigation issues directly with the applicant rather than leave it for a contractor to initiate this discussion.

The following webpage provides valuable information about CIAs

<http://www.qp.org.nz/consents/cultural-impact-assessment.php>

Archaeological assessments - Specialist assessments such as an Archaeological Assessment or survey could be commissioned as part of a CIA or as a separate report that provides tangata whenua with information needed to assess impacts on archaeological values from a cultural perspective.

State of environment reports - Within the New Zealand context, section 35 of the RMA 1991 requires the preparation of State of the Environment Reports at the national and sub-national levels. Recent examples are the Ministry for Environment's Report (1997, 2007) which provide a national overview, and regional and district government reports that present more detailed local perspectives. What is not always clear to the reader of such reports is how the monitoring methods employed by councils relate to the interests held by M ori and other sectors within the community. By working closely with M ori and stakeholders, resource management agencies could emphasise that the monitoring undertaken accurately assesses the quality and quantity characteristics for which the freshwater resource is valued by constituent groups. Increasingly cultural monitoring is sought by M ori. A variation of the concept of State of the Environment Reports is Te Pūrongo - Maniapoto State of the Environment Report 2002 and State of the Takiwa that has been developed by Ng i Tahu. State of the Takiw is promoted as a culturally-based environmental monitoring and reporting system (see www.ngaitahu.iwi.nz).

Training - The effectiveness of participation of tangata whenua would benefit from targeted training in resource management, freshwater management, interviewing techniques etc. What may emerge however is the lack of time for tangata whenua to commit to long term education such as university degrees and the need for module or block courses. Another issue that may prevent the uptake by tangata whenua is the issue of "prior learning". Examples of initiatives that are underway include:

- Wananga – to up skill whānau in resource management processes.
- Workshops – on taonga species e.g., tuna.
- Field days – how to use flow measuring devices, electric fishing.

Accreditation - Resource users may hold a form of environmental accreditation such as ISO or more specific to forestry certification from Forestry Stewardship Council (FSC), for example forest managers or owners who want to prove that their forest operation are socially beneficial and managed in an environmentally appropriate and economically viable manner can apply for forest management certification. Some accreditation systems include a social impact component as well as an indigenous component that in the New Zealand context could facilitate participation of tangata whenua.

Cultural Audits - Although not fully developed in the environmental sector, the opportunity exists for cultural audits to be undertaken by tangata whenua. For example in a South Island catchment, tangata whenua have negotiated an agreement with an irrigation company. All those drawing water from the Irrigation Scheme need to develop farm plans that detail environmental and cultural outcomes. Within the MOU there is provision for a cultural audit of the implementation of these plans. Throughout the country there are examples of tangata whenua working directly with resource users where these types of initiatives can be explored.

Settlement mechanisms (Statutory Acknowledgements, protocols etc.) - Each Treaty Settlement builds on those previously negotiated and as a result a number of mechanisms are found in Treaty Settlement Acts e.g statutory acknowledgements, protocols, implementation plans, the ability to make regulations, area management tools etc.

Annual planning processes - Although tangata whenua may participate in statutory planning processes, it is the annual planning processes that ultimately impact the degree to which statutory plans are implemented. Tangata whenua need to ensure that they have mechanisms in place to enable their priorities to be accommodated with annual plans (or their equivalent).

5.0 Conclusion

Tangata whenua are particularly sensitive to the use and development of freshwaters as they hold distinct perspectives on water which concern their identity and their custodial obligations to manage tribal waters. Tangata whenua are of the clear view that more effective participation is needed to ensure that the impacts experienced by tangata whenua in the past are not repeated. Of the many techniques developed to address issues of concern to Tangata whenua many rely heavily on professional expertise and objective, scientific philosophies, which may fail to recognise cultural values and benefit from cultural knowledge. This report presents (in section 2) examples of the knowledge of streams and rivers held within M ori communities that could benefit contemporary resource management if it can be determined how traditional knowledge and practices and scientific approaches can be communicated and integrated.

Participating in the application of monitoring tools alone is unlikely to achieve the water management outcomes sought by tangata whenua so we proceeded to identify a number of areas in which Tangata whenua are working.

Increasingly scientists, resource managers and stakeholders can see the benefits of reorienting water management in order for it to be more responsive to cultural beliefs, values and uses while complementing other initiatives in the area. Scientists also see opportunities for collaborating with tangata whenua in the future. The knowledge that M ori bring to water management is rooted in and informed by a traditional or customary lifestyle but the recommendations in the report allows for its adaptation to incorporate contemporary information and technology thus explicitly recognising that new information is continually generated as the environment is transformed. Although there are discussions at an international level about the loss or erosion of knowledge as indigenous communities become more integrated into regional or national economies, it is necessary to differentiate between situations where knowledge is adapting to new environments and economic conditions and those circumstances where knowledge is being lost due to a disruption of its transmission. The tools described in section 2 and the processes that we discuss in section 4 represent the evolving reality of tangata whenua needs, capacities and aspirations.

The nature of collaboration, in particular the **level** of participation by M ori and the **extent** of their knowledge that is shared, will need to be negotiated in each case and will be determined by the ability of the partners to develop a trusting relationship, agree on a vision for freshwaters within a region and the direction that needs to be taken to realise that vision. Refinement of cultural methods – like scientific methods – needs to continue.

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www.ngaitahu.iwi.nz

www.niwa.co.nz/our-science/freshwater/tools/shmak/summary

www.qp.org.nz/consents/cultural-impact-assessment.php

www.mahingakai.org.nz/research/marine-cultural-health-index-a-ngai-tahu-research-initiative

www.niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools on April 2012

Appendices

Appendix 1	CHI
Appendix 2	State of Takiwa
Appendix 3	Cultural indicators for wetlands
Appendix 4	RIVAS
Appendix 5	Cultural Flow Preferences

CULTURAL STREAM HEALTH ASSESSMENT

Date: Site no:

INDICATORS	UNHEALTHY				HEALTHY
1 Catchment land use	1. Land heavily modified	2	3	4	5. Appears unmodified Wetlands, marshes lost
2 Vegetation – banks & margins (100m either side)	1. Little or no vegetation - neither exotic or indigenous	2	3	4	5. Complete cover of vegetation – mostly indigenous
3. Use of the river banks + margins (100m either side)	1. Margins heavily modified	2	3	4	5. Margins unmodified
4. Riverbed condition	1. Covered by mud/sand slime, weed	2	3	4	5. Clear of (sediment) mud/sand/sediment/weed
5. Changes to river channel	1. Evidence of modification eg stopbanks, straightening, gravel removal, shingle build up	2	3	4	5. Appears unmodified
6. Water quality	1. Appears polluted eg foams, oils slime, weeds etc	2	3	4	5. No pollution evident
7. Water Clarity	1. Water badly discoloured	2	3	4	5. Water is clear
8 A variety of habitats	1. Little or no current, Uniform depth and limited	2	3	4	5 Current and depth varies creating a variety of different habitats

How would you describe the overall health of the river at this site?

1. Very unhealthy 2. 3. 4. 5. Very healthy

Please explain your answer _____

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

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

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

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

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

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

Please explain your answer _____

Would you return to this site in the future?

1. YES 5. NO.

STATE OF TAKIWA

State of the Takiwā

Site Definition Form

Site Code

Site Name Defined by on / /

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

Region of NZ eg Otago Catchment/Feature eg Waiau River

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

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

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

Mana Whenua

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

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

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

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

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

Please explain site significance / List any observations:

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

NGĀ MANU / BIRD SPECIES

Abundance

	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots

NGĀ IKA / FISH SPECIES

Abundance

	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots

NGĀ RAKAU / PLANT SPECIES

Abundance

	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots

OTHER TAONGA / Natural Resources

Abundance

	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots
	Few	Some	Lots

Geographical Position Area (sq m) Altitude (m) Map No (if 260 series)
East North Accuracy/Offset (m)

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

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

Describe these photos:

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

Photo filed: ☐ Filename:
Site mapped: ☐ TUMONZ/GIS code:

State of the Takiwā

Visit Form

Site Code

Visit Code

Use a separate form for Questionnaire

VISIT DETAILS Site Name: No. in Group:

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

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

Visitors from: Visit Purpose:

Weather Centre

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

Hot

Warm

Mild

Cool

Cold

Freezing

25°C or more

20

15

10

5

0°C or less

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

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

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

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

First Q

Full

Last Q

New

<<< waxing | waning >>>

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

7. Extra comment on weather:

Heritage/Archeological Details

Are there any signs of traditional use? ☐ Yes ☐ No

Describe signs / list observations

Site Issues or Pressures

Site Actions or Responses

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

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

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

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

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

Describe these photos:

OFFICE USE ONLY Entered into Takiwā database by: Date:

Site previously mapped: ☐ Photo filed: ☐ Filename:

Site mapped: ☐ TUMONZ/GIS code:

State of the Takiwā

Site Assessment - General

Site Code

A Visit form is also needed

Assessment Code

Visit Code

ENTRY DETAILS Site Name:

Visitor Name:

Visit date:

Number of people represented:

A. SITE ASSESSMENT DETAILS

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

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

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

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

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

Questions 3, 4, 5 and 6 consider suitability for harvesting mahinga kai

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

Details:

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

Details:

5. Tick if site is wahi tapu: ☐

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

Details:

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

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

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

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

Next page for Abundance questions ...

B. ASSESSMENT OF ABUNDANCE For each question, please list the species that you can see or hear, and circle their abundance. If they are mahinga kai species, please tick the MK box. List more on blank paper if necessary.

1. NGĀ RAKAU MĀORI / NATIVE PLANT SPECIES	Abundance	MK	Notes (condition, habits, etc.)
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	

1a. What % of the total site area is covered by native plant species? (within 100m radius)	0% a little 25% 50% 75% most 100%
--------------------------------------------------------------------------------------------	-----------------------------------------------

2. NGĀ MANU MĀORI / NATIVE BIRD SPECIES	Abundance	MK	Notes (condition, habits, etc.)
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	

3. NGĀ IKA MĀORI / NATIVE FISH SPECIE	Abundance	MK	Notes (condition, habits, etc.)
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	

4. NGĀ TAONGA MĀORI / Other Natural Resources	Abundance	MK	Notes (condition, etc.)
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	

5. INTRODUCED PLANTS AND ANIMALS	Abundance	MK	Notes (condition, controls, signs, etc.)
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	
	Few Some Lots <input type="checkbox"/>	<input type="checkbox"/>	

OFFICE USE ONLY Entered into Takiwa database by: Date:

State of the Takiwa

CHI: Cultural Stream Assessment

Site Code Use general assessment code if have one >> Assessment Code Visit Code ENTRY DETAILS Site Name: Visit date: Visitor Name: Number of people represented:

A. Cultural Stream Health Assessment

For each question, please circle a number.

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

Please explain your answer:

B. MAHINGA KAI SPECIES

For each question, please list the species that you can see or hear, and circle their abundance.
You can use a blank page to list more if necessary.

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

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

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

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

C. SITE ACCESS FOR HARVESTING MAHINGA KAI

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

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

Please explain your answer:

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

OFFICE USE ONLY Entered into Takiwa database by: Date:

State of the Takiwa

SHMAK Assessment

Site Code

Use general assessment code if have one >> Assessment Code

Visit Code

ENTRY DETAILS Site Name:

Visit date:

Visitor Name:

Number of people represented:

A. STREAM HABITAT

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

A1 Habitat Quality

Flow velocity Time an object travelling down the centre of the stream (do 3 times): secondsDistance travelled: metres Divide distance by the average time of seconds

eg. For 10m in 38s

Velocity = 0.26 m/s

Score = 8

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

Water pH

From the pH:



Water temperature

°C

Temp:



Time of day:

Score:

Water conductivity

uS/cm

Cond:



Water clarity (Take 3 readings):

cm

Calculate average clarity: cm

Note: for ease of use, scale is in opposite order to that in SHMAK doc.

Clarity:



A2 Composition of the Stream Bed *

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

Enter % Score

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

A3 Bank Vegetation *

True left = left bank looking downstream

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

%, true left %, true right Score

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

A4 Deposits

Tick best estimation of loose deposited material on the stream bed

Score

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

* NOTE: For A2 and A3 the relative scores are shown but percentage-weighted calculations can't be calculated here. Use the database to automatically do this and get an overall score for each.

B. STREAM-BED LIFE**B1 Invertebrates**

For each of 5 stone, sediment or water plant samples, tick a box if you can see any of these.

	1	2	3	4	5	Score
Worms (eg thin brown/red)						1
Flatworms, leeches						3
Freshwater crustaceans (amphipods, water fleas)						5
Small bivalves (up to 4 mm across)						3
Snails (4-6 mm across, rounded)						3
Snails (1-3 mm across, pointed)						4
Limpet-like molluscs (Latia, up to 8 mm wide)						7
"Axehead" caddis (Oxyethira, 2-3 mm long)						3
Midge larvae (3-7 mm long, white - red)						2
Damselfly larvae						4
Crane fly larvae						5
Beetle larvae and adults						6
Caddisfly larvae (rough stony cases, or of sticks & free living)						6
Smooth-cased caddisfly larvae (Olinga, to 10 mm, chestnut-brown)						9
Spiral caddis (Helicopsyche, to 3 mm wide)						10
Mayfly larvae (2-15 mm long)						9
Stonefly larvae (large species, to 20 mm)						10

B2 Periphyton (on exposed surfaces)

Using the same 5 samples, tick a box if you can see any of these.

	1	2	3	4	5	Score
Thin mat/film Under 0.5 mm thick	Green					7
	Light brown					10
	Black or dark brown					10
Medium mat 0.5 - 3 mm thick	Green					5
	Light brown					7
	Black or dark brown					9
Thick mat Over 3 mm thick	Green or light brown					4
	Black or dark brown					7
Filaments, short Under 2 cm long	Green					5
	Brown or reddish					5
Filaments, long Over 2 cm long	Green					1
	Brown or reddish					4

OFFICE USE ONLY Entered into Takiwa database by:

Date:

MAORI INDICATORS – WETLAND MONITORING FORM

Name of wetland:

Date:

People involved in monitoring:

WHAT'S CAUSING THE PROBLEMS?

% area of land uses/riparian factors affecting Cultural Values

0 = 0%	1 = 1–20%	2 = 21–40%	3 = 41–60%	4 = 61 – 80%	5 = 81–100%
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No. of point (sites) sources of pollution degrading *te Mauri*

0 = 0	1 = (1–2)	2 = (3–5)	3 = (6–9)	4 = (10–14)	5 = (>15)
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Degree of modification (drainage, water table, burning, in-flows, out-flows)
degrading *te Mauri*

1 = low	1 = moderate	3 = high	2 = v.high	5 = extreme
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No. of exotic (introduced, foreign) plants, algae, animals, fish, birds (pest types)
affecting Cultural Values

0 = 0	1 = (1–2)	2 (3–5)	3 (6–9)	4 (10–14)	5 (>15)
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TAONGA AND MAURI? (Maori information about the wetland, its attributes)

No. of *taonga* species (flora and fauna) within wetland

0 = 0	1 = (1–2)	2 (3–5)	3 (6–9)	4 (10–14)	5 (>15)
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% area of *taonga* plants within total wetland

0 = 0%	1 = 1–20%	2 = 21–40%	3 = 41–60%	4 = 61–80 %	5 = 81–100%
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% area of exotic (introduced, foreign) plants covering total wetland

0 = 0	1 = 1–20%	2 = 21–40%	3 = 41–60%	4 = 61–80%	5 = 81–100%
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No. of cultural sites within or adjacent to wetland

0 = 0	1 = (1–2)	2 (3–5)	3 (6–9)	4 (10–14)	5 (>15)
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Assessment of *te Mauri* (scale)

1 = weak or low	2 = average or moderate	3 = strong or high
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TRENDS/CHANGE/WETLAND GETTING BETTER OR WORSE?

Previous assessment date:

Present assessment date:

Change in No. of *taonga* (flora and fauna) species within total wetland area
(+, same or &)

0 = 0	1 = (1–2)	2 (3–5)	3 (6–9)	4 (10–14)	5 (>15)
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Change in % area of *taonga* plants within total wetland area
(+, same or &)

0 = 0%	1 = 1–20%	2 = 21–40%	3 = 41–60%	4 = 61–80%	5 = 81–100%
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Change in % area of exotic (introduced, foreign) plants covering total wetland
(+, same or &)

0 = 0%	1 = 1–20%	2 = 21–40%	3 = 41–60%	4 = 61–80%	5 = 81–100%
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No of **cultural sites protected** within or adjacent to wetland

0 = 0	1 = (1–2)	2 (3–5)	3 (6–9)	4 (1–14)	5 (>15)
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Assessment of change in *te Mauri*

1 = worse	2 = same	3 = improvement
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Or

1 = negative/fast	2 = negative/slow	3 = neutral	4 = positive/slow	5 = positive/fast
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Other comments about the wetland (e.g., use of wetland, customary access, customary rights, fitness for traditional cultural usage)



RIVAS

ATTRIBUTE	PRESENCE / ABSENCE IN CATCHMENT	ASSESSMENT			SIGNIFICANCE	
		Current condition	Risk	Ability to restore	Existing value	Historically
Wahi Taonga	Y/N					
Wahi tapuketia – buried taonga						
Wahi ana – important cave areas						
Tuhituhi nehera – rock drawing areas						
Wahi tohu – locators and their names within landscapes						
Wahi paripari – cliff areas		<p>Wahi taonga are to be identified during discussions with tangata whenua. Discussions may be complemented by mapping, by the sharing of reports, etc.</p> <p>It is necessary to get the following outputs –</p> <ul style="list-style-type: none"> • Identification of wahi taonga within a catchment with site specificity wherever possible. • Identification of any difference in the status or significance of sites e.g. wai tapu are likely to be accorded a higher level of significance • Identification of other data sources that could be accessed to provide additional data to support the identification by tangata whenua e.g. historical maps, manuscripts, Tribunal evidence, historical text, inventories, oral histories etc. 				
Tuahu – sacred place for spiritual purposes						
Wahi rakau – area of important trees						
Pa tawhito – ancient pa sites						
Wahi raranga – sources of weaving materials						
Maunga						
Wahi rua – food storage areas						
Wahi kaitiaki – resource indicators in the environment						
Wahi kohatu – rock formations						
Wahi mahi kohatu – quarries						
Wahi pounamu						
Tauranga waka						
Ara tawhito						
Wahi tapuketia – buried taonga						
Wahi ana – cave areas						
Tuhituhi nehera – rock drawing areas						

ATTRIBUTE		DATA COLLECTED
Takiwa		
1. Source protected		
2. Variable flow		Discuss basic hydrology – low flows, freshes, floods etc
3. Productive ecosystems – integrity of whenua and awa		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made.
4. Mostly native / little or no invasives		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made. Links to other assessment methods Links to other monitoring initiatives
5. Connections – groundwater/surface water		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made. Map if necessary
6. Connections – riparian to surface water		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made. Map if necessary
7. Passage / movement of sediment through the system		<ul style="list-style-type: none"> Record observations of tangata whenua and context in which observation made. Map if necessary
8. River mouth		Record observations of tangata whenua and context in which observation made.
Wai		
9. Different utility of different waterbodies		<ul style="list-style-type: none"> Discuss & map if necessary Record discussions
10. Character of different waterbodies protected		<ul style="list-style-type: none"> Discuss & map if necessary Record discussions
11. High quality water protected		<ul style="list-style-type: none"> Discuss & map if necessary Record discussions
12. Continuous flow source to sea		Record observations of tangata whenua and context in which observation made.
Settlements		
13. Kaika nohoanga, marae – all have safe water supplies		<ul style="list-style-type: none"> Discuss & map if necessary Record discussions
Mahinga kai		
14. Presence / absence of target kai species		<ul style="list-style-type: none"> Record historical Identify expected species composition Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made. Map if necessary Links to other assessment methods
15. Abundance of target kai species		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made Links to other assessment methods
16. Condition of species – fit for use		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made
17. Access for tangata to gather and use		<ul style="list-style-type: none"> Identify formal assessments undertaken Record observations of tangata whenua and context in which observation made
Wahi ingoa		
18. Placenames as indicators		Record observations of tangata whenua and context in which observation made
Access		
19. Access to wahi taonga		Record observations of tangata whenua and context in which observation made

The spreadsheet into which data is entered is available from gtipa@xtra.co.nz or from k.nelson@orcon.net.nz

ASSESSMENT OF SATISFACTION WITH RIVER FLOW

NAME: _____ DATE & TIME: _____

SITE NAME: _____

For each attribute listed below you are to decide whether or not you are satisfied that today's flow is sufficient to protect that attribute. You are to assign a 1 -7 rating

KEY:									
1	Little or no satisfaction	7	Very satisfied						
4	Moderate satisfaction	0	Not applicable to this site / not used in assessment						
ATTRIBUTE			SATISFACTION THAT OBSERVED FLOW PROTECTS THE ATTRIBUTE						
	Flow enables use of the site as a mahinga kai	0	1	2	3	4	5	6	7
	Flow keeps the riverbank vegetation watered	0	1	2	3	4	5	6	7
	Flow keeps the river free of weed / algae	0	1	2	3	4	5	6	7
	Flow provides a range of habitats instream and along riverbank	0	1	2	3	4	5	6	7
	Flow protects mahinga kai species in and around this site	0	1	2	3	4	5	6	7
	Flow enables fish to move throughout the catchment	0	1	2	3	4	5	6	7
	Flow enables gathering at this site (i.e. is accessible, safe)	0	1	2	3	4	5	6	7
	Flow enables a range of recreational uses	0	1	2	3	4	5	6	7
	Flow keeps this site free of unnatural gravel buildups	0	1	2	3	4	5	6	7
	Flow keeps riparian wetlands, springs, and/or tributaries connected to mainstem	0	1	2	3	4	5	6	7
	Flow enables cultural use of connected wetlands, springs & tributaries	0	1	2	3	4	5	6	7
	Flow appears to have been higher recently - evidence is present	0	1	2	3	4	5	6	7
	Flow enables use of the river for health and wellbeing purposes	0	1	2	3	4	5	6	7
	Flow contributes to a good feeling about this site	0	1	2	3	4	5	6	7
	Flow enables whanau to be proud of this site	0	1	2	3	4	5	6	7
	Flow protects valued features at this site	0	1	2	3	4	5	6	7
	Flow enables development and use of Maori lands / reserves / easements	0	1	2	3	4	5	6	7
	Flow maintains links between this site and other culturally significant sites in the catchment	0	1	2	3	4	5	6	7
	Flow protects features important to placenames, and important in tribal stories, , whakapapa, waiata etc	0	1	2	3	4	5	6	7

OVERALL ASSESSMENT

Are you satisfied that today's river flow protects cultural values **overall** at this site?

1 2 3 4 5 6 7

Would you return and use this site again in the future at the current flow?

1 2 3 4 5 6 7

What actions would you like to see taken at this site

What attributes not listed on page one of this assessment form did you use to assess whether or not you are satisfied that the flow protects the cultural values at this site?

Any other comments

COMPLETE ON FIRST VISIT & THEN ONLY IF CHANGES OBSERVED

QUESTION	YES	NO
1. Is the vegetation of the river bank to protect it from erosion?		
2. Is the rate of sediment erosion or accumulation occurring as you would expect?		
3. Is the channel bed neither aggrading nor degrading?		
4. Is there a range of sediment types on the channel riverbed?		
5. Do you regularly get a flush through that clears excess sediment from spawning gravels, and remodels existing pattern of habitats?		
6. Is the mix of pools, riffles and runs approximately the same as historic times?		
7. Does the channel remain unclogged by sediment?		
8. Is the main channel connected to the floodplain?		
9. From your perspective are flow-related cues / triggers (e.g spawning, heke) occurring for the range of species present in the river?		
10. Is instream habitat suitable for aquatic species that are significant to you?		
11. Is stranding or isolating of species during summer or winter a rare event?		
12. Does the river retain ample instream cover?		
13. Are the species of value to you able to reach the habitat types they require?		
14. Do occasional high flows flow over the banks and sweep nutrients and organic matter into the channel?		
15. Have local wetlands retained their same surface area that they had historically?		
16. Do all reaches of the river that you use maintain flow even during dry, low-flow periods?		
17. Is floodplain vegetation in good health?		
18. Are healthy riparian buffers providing any shade for the river channel?		
19. Is the channel largely unaffected by encroaching invasive vegetation?		
20. Are algae blooms rare occurrences?		

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