

## Appendix 2: Data Collected at Five Sites

The pages that follow show how the information can be collated and presented to iwi.

### Scores for each of the indicators

Each of the indicators was scored in the field by rūnanga members. What is shown in the table that follows is the average of the rūnanga members' scores. For example, the individual scores for catchment land use were 4, 5, 4, and 4.5, resulting in an average score of 4.6.

### Calculating component 2 of the CHI

Two of the indicators are used for assessing the mahinga kai component:

- suitability for mahinga kai
- access to the site.

The species listed are also used to determine the 1–5 measure for the number of species present.

### Calculating component 3 of the CHI

The five factors that are then used to calculate the CHI are shaded. In the case of McRaes Creek, the five factors scored 4.6, 4.75, 5, 5 and 5. These five scores are then averaged. The average for the stream health component, as shown in the CHI, is 4.87.<sup>1</sup>

### Other comments

Each assessor is able to write comments on the assessment form. Comments are then collated and made available to the rūnanga.

For convenience the MCI and SHMAK scores for the sites are included at the bottom of the page. These would not normally form part of the assessment. They have been included here for the information of the rūnanga given that MCI and SHMAK were part of the study design.

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<sup>1</sup> See the description of McRaes Creek in section 5.2.

## McRaes Creek

Taieri Catchment:

Site Name: McRaes Creek

Stream order: 1

Map sheet: 144

Map reference: 99862

Indicators	Rating 1–5	Comments on the site
Catchment condition	4.6	Rūnanga comments, when they visited the site, were as follows:
Riverbank condition	5	Safety drinking the water
River shape	–	<ul style="list-style-type: none"> <li>• <i>Tasted great (upstream over rocks).</i></li> <li>• <i>Natural.</i></li> </ul>
Riparian vegetation	4.75	Fishing at the site
Indigenous vegetation (on adjacent land)	4.75	<ul style="list-style-type: none"> <li>• <i>For kōura probably.</i></li> <li>• <i>This small stream condition is good.</i></li> </ul>
Mahinga kai birds	3.6	Eating the fish
Riverbed condition	4.25	<ul style="list-style-type: none"> <li>• <i>Just great.</i></li> </ul>
Use of the river (modifications)	4.75	Balance
Use of the river (takes / discharges)	5	<ul style="list-style-type: none"> <li>• <i>Really nice wee creek and great bush around.</i></li> <li>• <i>Native bush, nice clear flowing tributary, limited space present though – much of the same.</i></li> </ul>
Flow visible	5	Overall health
Flow heard	5	<ul style="list-style-type: none"> <li>• <i>Popular walking track through creek.</i></li> <li>• <i>This is exactly where human cross the creek.</i></li> </ul>
Odours present / absent	5	Access at the site
Water quality	5	<ul style="list-style-type: none"> <li>• <i>Can access by foot.</i></li> <li>• <i>However it's a long way to come on foot.</i></li> </ul>
Water clarity	5	Harvesting mahinga kai from the site
Sediment present / absent	5	<ul style="list-style-type: none"> <li>• <i>Fish. Probably can't take plants etc.</i></li> <li>• <i>Access problems means that this would not be a destination.</i></li> </ul>
Use of riparian areas	5	Final comments
Safety tasting water	4	<ul style="list-style-type: none"> <li>• <i>Really nice area. With lots of bush and water sounds.</i></li> <li>• <i>It is a shame that sites like this are not available closer to home.</i></li> <li>• <i>Very nice natural site. Currently a reserve let's hope it stays this way.</i></li> <li>• <i>We will visit again. Native flora and fauna.</i></li> </ul>
Suitability for fishing	4.5	
Safety eating fish	4.75	
Balance between land and water	4.75	
Abundance of birds	2.5	
Diversity of birds	2.25	
Abundance of plants	4	Species that were present when the site was surveyed were:
Diversity of plants	4.75	<ul style="list-style-type: none"> <li>• kōura (5)</li> <li>• fern, kānuka, mānuka, toetoe, broadleaf, aruhe</li> <li>• kererū, tūī, blue heron.</li> </ul>
Access to the site	3.5	
Suitability for harvesting mahinga kai	1.75	
<b>Overall score</b>	<b>4.5</b>	<b>MCI score 121</b> <b>SHMAK score 5</b>



**Photograph 13:**  
**Looking upstream.**



**Photograph 14: Looking downstream.**

## Barbours Stream

Taiari Catchment:

Site Name: Barbours Stream

Stream order: 1

Map sheet: H44

Map reference: 645913

Indicators	Rating 1–5	Comments on the site	
Catchment condition	2.5	<p>Rūnanga comments, when they visited the site, were as follows:</p> <p>Safety drinking the water</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Fishing at the site</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Eating the fish</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Balance</p> <ul style="list-style-type: none"> <li>• <i>Both not good.</i></li> <li>• <i>Slime is unappealing.</i></li> </ul> <p>Overall health</p> <ul style="list-style-type: none"> <li>• <i>Water quality not good at all. A lot of human interference on banks.</i></li> <li>• <i>The slime trails are yuck.</i></li> <li>• <i>Water detracts from the catchment.</i></li> </ul> <p>Access at the site</p> <ul style="list-style-type: none"> <li>• <i>Locked gates. DOC land.</i></li> <li>• <i>Not really, this is private property. No I would not fish here.</i></li> <li>• <i>Locked gates.</i></li> </ul> <p>Harvesting mahinga kai from the site</p> <ul style="list-style-type: none"> <li>• <i>Access and lack of quality.</i></li> <li>• <i>We did not see any fish, maybe kōura?</i></li> <li>• <i>Too far. Too remote. Locked gates.</i></li> </ul> <p>Final comments</p> <ul style="list-style-type: none"> <li>• <i>Really horrible site.</i></li> <li>• <i>Not a place to fish from. Most tussocks. Not a viable proposition. Too far from home.</i></li> </ul>	
Riverbank condition	4.5		
River shape	–		
Riparian vegetation	2.5		
Indigenous vegetation (on adjacent land)	3.6		
Mahinga kai birds	1		
Riverbed condition	2.6		
Use of the river (modifications)	2.6		
Use of the river (takes / discharges)	4		
Flow visible	5		
Flow heard	5		
Odours present / absent	3		
Water quality	4		
Water clarity	4.5		
Sediment present / absent	3		
Use of riparian areas	1		
Safety tasting water	1		
Suitability for fishing	1		
Safety eating fish	1		
Balance between land and water	1.3		
Abundance of birds	1		
Diversity of birds	1		
Abundance of plants	3.6	<p>Species that were present when the site was surveyed were:</p> <ul style="list-style-type: none"> <li>• tussock, wawa, taramea, harakeke.</li> </ul>	
Diversity of plants	3.6		
Access to the site	1		
Suitability for harvesting mahinga kai	1.3		
<b>Overall score</b>	<b>1.6</b>	<b>MCI score 143</b>	<b>SHMAK score 3</b>



**Photograph 15:  
Looking upstream.**

**Photograph 16:  
Looking  
downstream.**



## Owhiro Creek

Taiari Catchment:

Site Name: Owhiro Creek

Stream order: 2

Map sheet: 144

Map reference: 994749

Indicators	Rating 1–5	Comments on the site
Catchment condition	1	<p>Rūnanga comments, when they visited the site, were as follows:</p> <p>Safety drinking the water</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> <li>• <i>Water colour, discharge, grazed.</i></li> <li>• <i>Dirty, grazing, discharge.</i></li> </ul> <p>Fishing at the site</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Eating the fish</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Balance</p> <ul style="list-style-type: none"> <li>• <i>Grasses only; this is just a stream.</i></li> <li>• <i>Both bad.</i></li> <li>• <i>Both bad.</i></li> </ul> <p>Overall health</p> <ul style="list-style-type: none"> <li>• <i>Because of discoloration. Unfit for anything.</i></li> </ul> <p>Access at the site</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> <li>• <i>Private farmland.</i></li> </ul> <p>Harvesting mahinga kai from the site</p> <ul style="list-style-type: none"> <li>• <i>No.</i></li> </ul> <p>Species that were harvested in the 19th century include:</p> <ul style="list-style-type: none"> <li>• eels.</li> </ul> <p>Species that were present when the site was surveyed were:</p> <ul style="list-style-type: none"> <li>• tuna (long finned) (4)</li> <li>• inanga(7).</li> </ul>
Riverbank condition	2.5	
River shape	–	
Riparian vegetation	1.25	
Indigenous vegetation (on adjacent land)	1	
Mahinga kai birds	1	
Riverbed condition	1	
Use of the river (modifications)	1	
Use of the river (takes / discharges)	1	
Flow visible	4	
Flow heard	2	
Odours present / absent	1	
Water quality	1.25	
Water clarity	1.5	
Sediment present / absent	1.3	
Use of riparian areas	1	
Safety tasting water	1	
Suitability for fishing	1	
Safety eating fish	1.25	
Balance between land and water	3	
Abundance of birds	1	
Diversity of birds	1	
Abundance of plants	1	
Diversity of plants	1	
Access to the site	2	
Suitability for harvesting mahinga kai	1	
<b>Overall score</b>	<b>1</b>	<b>MCI score 71</b> <b>SHMAK score 1</b>



**Photograph 17:  
Looking upstream.**



**Photograph 18:  
Looking  
downstream.**

## Taieri River – Ferry Bridge

Taieri Catchment:

Site Name: Taieri River – Ferry Bridge

Stream order: 3

Map sheet: H45

Map reference: 891646

Indicators	Rating 1–5	Comments on the site
Catchment condition	2	Rūnanga comments, when they visited the site, were as follows:
Riverbank condition	2	Safety drinking the water
River shape	–	<ul style="list-style-type: none"> <li>Discoloured. High recreational use – boats etc. Tidal.</li> </ul>
Riparian vegetation	2.3	<ul style="list-style-type: none"> <li>Is tidal.</li> </ul>
Indigenous vegetation (on adjacent land)	1.6	<ul style="list-style-type: none"> <li>Farms are near.</li> </ul>
Mahinga kai birds	2	Fishing at the site
Riverbed condition	1	<ul style="list-style-type: none"> <li>When clean.</li> <li>Fast, flowing.</li> </ul>
Use of the river (modifications)	1	Eating the fish
Use of the river (takes / discharges)	5	<ul style="list-style-type: none"> <li>Would need to know when it was caught.</li> </ul>
Flow visible	5	Balance
Flow heard	5	<ul style="list-style-type: none"> <li>Flows into a native reserve – but could be tidied up more.</li> </ul>
Odours present / absent	5	Overall health
Water quality	3	<ul style="list-style-type: none"> <li>Discoloration. Too much human activity. Modification.</li> </ul>
Water clarity	2.3	<ul style="list-style-type: none"> <li>Good, fast-flowing river. No livestock present. Good deep water.</li> </ul>
Sediment present / absent	1	Access at the site
Use of riparian areas	2.6	<ul style="list-style-type: none"> <li>Yes have access but have a struggle.</li> </ul>
Safety tasting water	2	Harvesting mahinga kai from the site
Suitability for fishing	3.6	<ul style="list-style-type: none"> <li>Fishing only.</li> </ul>
Safety eating fish	3.3	<ul style="list-style-type: none"> <li>Is tidal but also heavy influence of upstream areas.</li> </ul>
Balance between land and water	3.3	Final comments
Abundance of birds	2	<ul style="list-style-type: none"> <li>Exposed to winds, etc.</li> </ul>
Diversity of birds	1	
Abundance of plants	2	Species that were harvested in the 19th century include:
Diversity of plants	1	<ul style="list-style-type: none"> <li>eels, whitebait, fernroot, kāuru.</li> </ul>
Access to the site	3.6	Species that were present when the site was surveyed were:
Suitability for harvesting mahinga kai	2.6	<ul style="list-style-type: none"> <li>harakeke, tussock.</li> </ul>
<b>Overall score</b>	<b>3.3</b>	<b>MCI score 80</b> <b>SHMAK score 5</b>



**Photograph 19:  
Looking upstream.**



**Photograph 20:  
Looking  
downstream.**

## Island Stream – Maheno

Taiari Catchment:

Site Name: Island Stream – Maheno

Stream order: 2

Map sheet: J42

Map reference: 390582

Indicators	Rating 1–5	Comments on the site
Catchment condition	1	Rūnanga comments, when they visited the site, were as follows:
Riverbank condition	2.6	Safety drinking the water
River shape	–	<ul style="list-style-type: none"> <li>No way!!</li> </ul>
Riparian vegetation	2	Fishing at the site
Indigenous vegetation (on adjacent land)	1	<ul style="list-style-type: none"> <li>No.</li> </ul>
Mahinga kai birds	1.25	Eating the fish
Riverbed condition	1	<ul style="list-style-type: none"> <li>Pollution evident.</li> </ul>
Use of the river (modifications)	1.3	Balance
Use of the river (takes / discharges)	1.25	<ul style="list-style-type: none"> <li>Beautiful rich farmland well watered at the river's expense. The farmland is healthy while the river suffers.</li> <li>Shitty land use, shitty river.</li> </ul>
Flow visible	1	Overall health
Flow heard	1.25	<ul style="list-style-type: none"> <li>Polluted, smelly, area changed heaps.</li> </ul>
Odours present / absent	1.25	Access at the site
Water quality	1	<ul style="list-style-type: none"> <li>Site has been destroyed.</li> <li>Runoff from surrounding lands. This is a dairying area.</li> </ul>
Water clarity	1	Harvesting mahinga kai from the site
Sediment present / absent	1	<ul style="list-style-type: none"> <li>Polluted.</li> </ul>
Use of riparian areas	1	Final comments
Safety tasting water	1	<ul style="list-style-type: none"> <li>I said Yuck for an earlier river. God knows what I could say here.</li> <li>The worst water quality I have seen so far.</li> </ul>
Suitability for fishing	1	
Safety eating fish	1	
Balance between land and water	1	
Abundance of birds	1.5	
Diversity of birds	1	
Abundance of plants	1.5	Species that were harvested in the 19th century include:
Diversity of plants	1	<ul style="list-style-type: none"> <li>eels, kanakana, whitebait.</li> </ul>
Access to the site	2.75	Species that were present when the site was surveyed were:
Suitability for harvesting mahinga kai	1	<ul style="list-style-type: none"> <li>wīwī, tussock</li> <li>ducks</li> <li>tuna (short finned) (15), tuna (long finned) (4), inanga (1).</li> </ul>
<b>Overall score</b>	<b>1</b>	<b>MCI score 78</b> <b>SHMAK score 1</b>



**Photograph 21:  
Looking upstream.**



**Photograph 22:  
Looking  
downstream.**

## Appendix 3: Recommended Recording Form for Future Use

### Cultural Stream Health Assessment

Indicators	Unhealthy			Healthy			
Catchment land use	1	Land heavily modified (e.g. grazed)	2	3	4	5	Appears unmodified
Use of the river margins (100 m either side)	1	Margins heavily modified	2	3	4	5	Margins unmodified
Use of the river channel	1	Evidence of modification (e.g. stopbanks, straightening, gravel removal, stock damage)	2	3	4	5	Appears unmodified
River flow	1	Cannot see movement	2	3	4	5	Obvious movement of water (riffles, whitewater)
Water quality	1	Appears discoloured or polluted (sediment/foams evident)	2	3	4	5	Water clear, no pollution evident

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:

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### Birds

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

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_  
 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_  
 7. \_\_\_\_\_ 8. \_\_\_\_\_ 9. \_\_\_\_\_

### Plants

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

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_  
 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_  
 7. \_\_\_\_\_ 8. \_\_\_\_\_ 9. \_\_\_\_\_

### Access

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

1 Not able to harvest at this site                      2                      3                      4                      5 Able to harvest – no restrictions

Please explain your answer:

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Would you return to this site in the future?

1 Yes

2

3

4

5 No

### Final comments

**Please describe the health of this site:**

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## Appendix 4: Questions Asked

### Sample questions

The following questions were used to identify indicators that Maori would use to assess freshwater resources. The intention was to have an interactive ‘conversation’ free of jargon, rather than a structured interview. The list of indicators was drawn principally from Questions 1 and 2. Question 6 enabled us to revalidate the sites that had been chosen.

1. If you drove up beside a beautiful healthy stream, what would it look like?
2. How do you assess a site and decide whether to fish there or not?
3. What has impacted on the health of streams and rivers?
4. What has impacted on your mahinga kai?
5. What traditional monitoring techniques have you heard of – specific to rivers?
6. What are some of the sites that you use or used in the past in the Taieri / Kakanui catchments? What was harvested from these areas?
7. What could iwi add to the management process?
8. What are the barriers that stop us participating now?