

CULTURAL HEALTH ASSESSMENTS & WATER MANAGEMENT FOR THE RAKAHURI – WAIMAKARIRI ZONE



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WORKING DRAFT

**PLEASE NOTE THAT THIS REPORT IS A WORKING DRAFT THAT
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**IT IS YET TO BE APPROVED BY TE NGAI TUAHURIRI RUNANGA
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**SOME OF THE RECOMMENDATIONS COULD BE SUBJECT TO
AMENDMENT AFTER FURTHER DISCUSSIONS WITH NGAI
TUAHURIRI RUNANGA**

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CHAPTER 1: INTRODUCTION

The physical structure of a landscape through which the rivers that are valued by Ngai Tahu set the eco-cultural character of each river. Whether the reach of a river is wide or narrow, braided and shallow, deep or sluggish; whether it is open to the ocean, partly protected, or altogether cut off from the sea; whether it has much freshwater flow or little— all of these factors together determine what species will survive, what ecological processes will predominate, and what resources are available to sustain whanau and communities. It also helps us assess the estuaries which are places heavily used by Ngai Tahu. Likewise, factors such as the quality of soils in the catchment, and whether the land is covered by native vegetation, or covered by pastures upon which beef, sheep or dairy cows graze, or roads and houses, will affect the quality and the amount of water in the river, and thereby influence the biological populations and ecological processes in the river. It is these populations, ecological processes and functioning of the rivers and estuaries that are crucial to ensuring the cultural health of the rivers of the Waimakariri – Rakahuri Zone.

1.1 Project objectives and methodology

The overall objective of this project is to determine the water management priorities for the Waimakariri – Rakahuri Zone, from the perspective of Manawhenua. More specifically, this report:

- Provides an overview of some of the water dependent cultural values of the catchment;
- Identify the characteristics of the waterways of the Ashley that whanau believe will maintain, rehabilitate or restore their values;
- Outline the results of the health assessments undertaken by whanau at a number of sites in the lower catchment;
- Outline the flow preferences of whanau and water requirements;
- Recommend management priorities to enable waterways to meet the Kaitiakitanga standards in the Canterbury Water Management Strategy.

We have therefore:

- 1) Introduced some publicly available cultural information pertaining to cultural interests associated with the waterways in the zone;
- 2) Identified – where possible - the extent and/or location of these interests;
- 3) Identified water related issues of concern to Manawhenua that need to be addressed by Environment Canterbury.

The principal sources of historical information were obtained from written records held by Ngai Tahu. These data are complemented by:

- the field assessments using the Cultural Health Index in the Rakahuri undertaken by whanau in December 2013 and in 2015;
- flow assessments undertaken by the manawhenua team 2013-2014
- the field assessments using the Cultural Health Index in the Waimakariri area undertaken by whanau in 2015;

1.2 Structure of this Report

This report has been divided into a number of chapters:

Chapter 1 sets out the scope, objectives and terminology used.

Chapter 2 introduces Ngai Tuahuriri Runanga.

Chapter 3 presents the results of the cultural assessment.

Chapter 4 concludes with a series of recommendations.

1.3 Terminology

This report is principally concerned with the values of Manawhenua. While Manawhenua is discussed more fully in Chapter 2 definitions for a number of key phrases are given below.

Mana whenua is the term used to describe the **right** to use resources in an area. Accompanying this is the right and responsibility to make management decisions.

Manawhenua is the term used to describe the **people** who hold and exercise the rights of mana whenua.

Ngai Tahu In this report this is a collective term used often in substitution to identify all Ngai Tahu across Canterbury who exercise the rights of Manawhenua in the specific localised contexts within the Canterbury Region.

Rakahuri We have referred in the report to the Rakahuri which is one of the legal names for the Ashley as the placename was changed to dual placenames as part of the Ngai Tahu Claims Settlement Act 1998.

CHAPTER 2 – THE SETTING

2.0 Background

Water is the foundation of life. It is also the key driver of ecosystem and economic development. Historically, water sustained settlements and cultural practices (including mahinga kai); it nourished taonga species and provided navigational pathways. Although its ability to sustain these cultural values today may be compromised, water remains a source of sustenance in Canterbury. Where water is scarce or in demand – as it is across the Canterbury region - its centrality is even more pronounced. This has the potential to place Ngai Tahu in competition or conflict with non-Maori seeking to utilise valued waters for what Ngai Tahu contends are unsustainable uses that will seriously and possibly irreversibly impact cultural ties to those same waters.

For Ngai Tahu the value of water in the Canterbury catchments involves more than just the economic value of contested water, or the debate between instream versus extractive uses. The maintenance of flowing streams with high quality water has become a symbol to Ngai Tahu of the determination to preserve their whakapapa, the use of their whenua (which includes reserve lands and easements previously granted by the Crown, plus entitlements and other acknowledgements from the Settlement), and the rivers that have sustained them historically.

Within this chapter, four aspects are discussed:

1. The concept of Manawhenua;
2. Manawhenua interests in Canterbury;
3. Manawhenua interests in the freshwaters of Canterbury; and
4. the Rakahuri catchment.

2.1 Manawhenua

In traditional Maori society the right of control (guardianship) and the right to use a resource were inseparable and together were central to effective resource management. Guardianship was recognized as the holding of mana whenua rights over the resource, these being established by whakapapa, take raupatu (conquest) and ahika (continuing usage) (Palmer & Goodall, 1989 cited in Jull 1989, 10)

Manawhenua relates to authority over a particular geographic area, usually defined by natural boundaries. In the area around the Rakahuri it is Ngai Tuahuriri who hold manawhenua status. Manawhenua rights are accompanied by responsibility to manage the resources sustainably for future generations. Kaitiakitanga dictates a responsibility to care for the physical, ecological and spiritual well-being of a place or resource.

A group's manawhenua status over an area must be asserted by continued occupation (ahi kaa) or use of the resources. In a literal sense, 'ahi kaa' meant that the tribe's 'fires' had to be kept burning on the land. Territorial jurisdictions were strictly defined and vigorously defended. Evison says that:

"The chiefs and elders of the Ngai Tuahuriri hapu ... based at Kaiapoi pa, were particularly jealous of their territorial rights and allocated territory and resources on land and sea, to the

minor chiefs and heads of whanau, who apportioned the work and responsibilities among individuals.” (Evison, 1993:6)

In recent decades the Manawhenua status of whanau has been recognised in statute by the Crown.

2.3 Te Runanga o Ngai Tahu Act 1996

The legal identity of Te Runanga o Ngai Tahu is established in the Te Runanga o Ngai Tahu Act 1996. It is the tribal representative body of Ngai Tahu whanui. It is a body corporate, established on 24 April 1996 under section 16 of the Te Runanga o Ngai Tahu Act 1996. Pursuant to section 3 of that Act, “*the Act binds the Crown and every person (including any body politic or corporate) whose rights are affected by any provision of this Act*”. The members of Te Runanga o Ngai Tahu are the 18 papatipu Runanga, each of which is defined in the Act, as is the takiwa for each. Te Ngāi Tūāhuriri Rūnanga is one such Runanga. This Act establishes who holds manawhenua rights over specific lands and waters within the rohe of Ngai Tahu. Te Ngāi Tūāhuriri Rūnanga is based at Tuahiwi.



Figure 1: Mahaanui – the wharenui at Tuahiwi Marae

2.4 Te Runanga o Ngai Tuahuriri

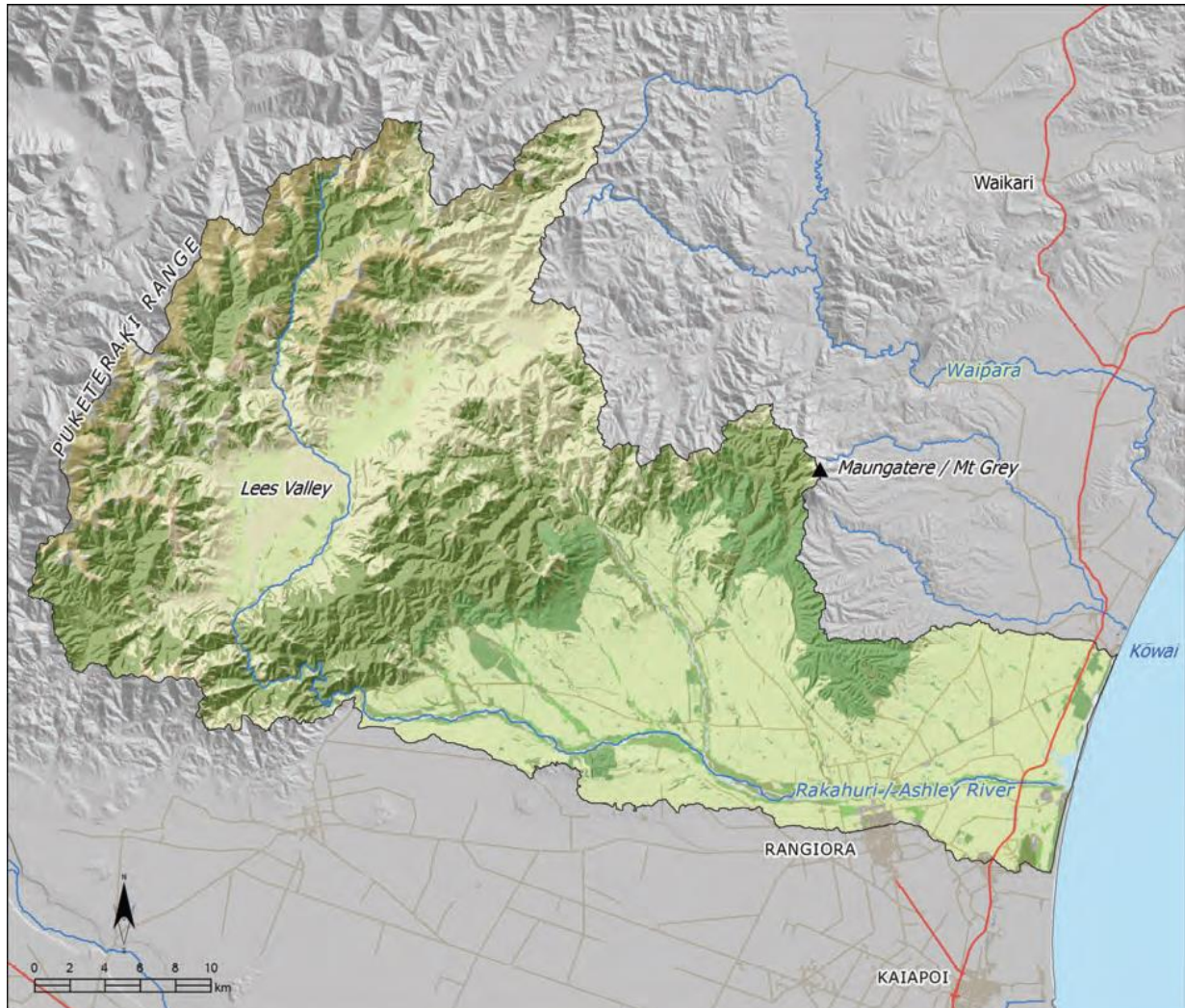
As one of the 18 papatipu Runanga, the takiwa of Te Ngāi Tūāhuriri Rūnanga, as defined in the Te Runanga o Ngai Tahu Act 1996, extends from the Hurunui to the Hakatere, and thence inland to the Main Divide. The Rakahuri is therefore wholly within the takiwa of Te Ngāi Tūāhuriri Rūnanga.

2.5 The Rakahuri / Ashley Catchment (134,000ha)

Rakahuri flows generally southeastwards for 90 kilometres before entering the Pacific at Waikuku Beach, Pegasus Bay north of Christchurch. The river is a medium-sized hill-fed river. The river flows from the Puketeraki hills in the west Lees Valley. The upper tributaries of Ashley River are single threads, with minor braiding in the gravel deposits of Lees Valley. River down-cutting has kept pace with uplift of greywacke sandstone to produce Ashley Gorge, a narrow winding channel. The river exits the hills at a gorge near Oxford township. The upper river flows through the Ashley Gorge, while the lower reaches of the river are braided. The channel across the plain consists of braids on a floodplain about 500m wide. In the braided reaches below the gorge, two or three of the shallow

braids carry water during normal flow conditions. Large areas of open gravel within the active floodplain provide breeding sites for river-bed birds (North Canterbury Catchment Board & Regional Water Board, 1982; O'Donnell & Moore, 1983).

Figure 2: The Rakahuri (sourced from the Mahaanui Iwi Plan, 2013)



Behind Waikuku Beach is one of the largest, and relatively unmodified estuaries in New Zealand. It sustains abundant bird life, including the wrybill and black stilt. The estuary includes sand dunes and spits, open brackish water, a river delta, low mud banks and extensive mudflats. Saltwater Creek joins the estuary as a meandering tidal swampland.

In addition, many migratory birds over-winter here. Many of these species are recognised as taonga species in the Ngai Tahu Claims Settlement Act 1998. The river provides important breeding habitat for several species of birds, while the estuary is an important spawning ground and nursery for a number of fish species. Protecting these features is one of the priorities for Ngai Tahu.

With respect to quality, although it is variable, parts of the river have good water quality although extended periods of low flows (including naturally dry reaches) in the late summer frequently lead to nuisance growths of algae.

In relation to quality, Ashley River is characterised by low natural water storage and low water flows, particularly in summer. Annual rainfall in the catchment varies from 2,000 mm in the Puketeraki Ranges to 750 mm at the coast. However, a sharp decrease in rainfall away from the ranges, a rainshadow effect in the upper catchment and losses to groundwater combine to produce low river water levels. For several weeks each summer, the middle reaches of the river may be dry. Whanau have however observed how the pattern of dewatering has changed over the years, with significant change being observed over the last 10 years. This contrasts with the high summer flows of snow-fed braided rivers, such as the Rakaia and Waimakariri. Peak flood discharges in Ashley River can exceed 200 cubic metres per second. Major river engineering works, such as stop-banks and rock barriers, have been constructed to contain floodwaters in the middle and lower reaches. The impact of these alterations are of concern to manawhenua.

The river-mouth habitats are a diverse combination of delta, estuarine mudflats and saline swamplands behind a sand dune barrier (O'Donnell & Moore, 1983). The estuarine habitats support a wide variety of rare, uncommon and migratory waterfowl, as well as high numbers of more common species. The estuary is considered to be of "outstanding" value for wildlife (O'Donnell & Moore, 1983), and "one of the most important bird habitats on A Directory of Wetlands in New Zealand the east coast of the South Island because of the diversity of species" and "because of its role as a sanctuary for migratory wading birds" (North Canterbury Catchment Board & Regional Water Board, 1982).

Within the Rakahuri Catchment whanau assessed the following sites using the Cultural Health Index:

1. Ashley Gorge
2. Garry river
3. Okuku River
4. Rakahuri at Rangiora
5. Rakahuri at Mount Thomas
6. Rakahuri at State Highway 1
7. Rakahuri at Raupo Berm
8. Waikuku Stream
9. Taranaki Creek (Preece Road)
10. Taranaki Creek (Pa Road)
11. Taranaki Creek (Waikuku Beach road)
12. Taranaki Creek (Floodgate)
13. Waikuku Stream

2.6 Waimakariri Zone

The total land area in the Waimakariri River Catchment is 3654 km². There is a mix of arable Land, tussock and bush covered hill and high country, riverbed, steep mountain land, which has severe to extreme limitations for any form of productive use.

Urban centres of population within the catchment include Rangiora, Kaiapoi, Woodend, Belfast and Oxford. Most of Christchurch City lies just outside the catchment but on the floodplain of the Waimakariri River.

Land use on the plains is diverse. The shallow stony soils which comprise most of the plains support dryland sheep farming. Cropping is mainly confined to the free-draining deeper soils along the Eyre River and fringing the wetter soils on the lower plains. On the lower plains, high water tables limit farming primarily to dairy, beef or deer farming. Orchardng and other horticultural cropping is increasing in area on the plains. Life-style farms are a significant land use. The main limitations to increased production on the plains are the shallow soils which are in the majority, and the lack of an irrigation water supply.

The plains contrast sharply with the upper Waimakariri River Catchment basin, where high altitudes, long cold winters, and inhospitable terrain, severely limit agricultural production. These same features, so adverse to agriculture, add to the attraction and value of this area for outdoor recreation and tourism. The upper catchment contains the last remaining significant areas of relatively undisturbed indigenous ecosystems within the catchment.

Beneath the Waimakariri-Ashley Plain is a groundwater resource of great significance to the communities which live on the plain. It provides 90% of the area's drinking water, mostly without any treatment, and with the surface streams, as at March 2004, irrigates some 4,500 hectares.

With the Waimakariri catchment whanau assessed:

1. Cam River
2. Southbrook
3. Kaiapoi River
4. Cust River
5. Courtenay
6. Silverstream

2.7 Vision for the Rakahuri – Waimakariri Zone

In multiple forums representatives of Te Ngai Tuahuriri Runanga have described their vision for the zone. This is summarised in Figure 3.

TE MOEMOEA – OUR VISION FOR THE ZONE

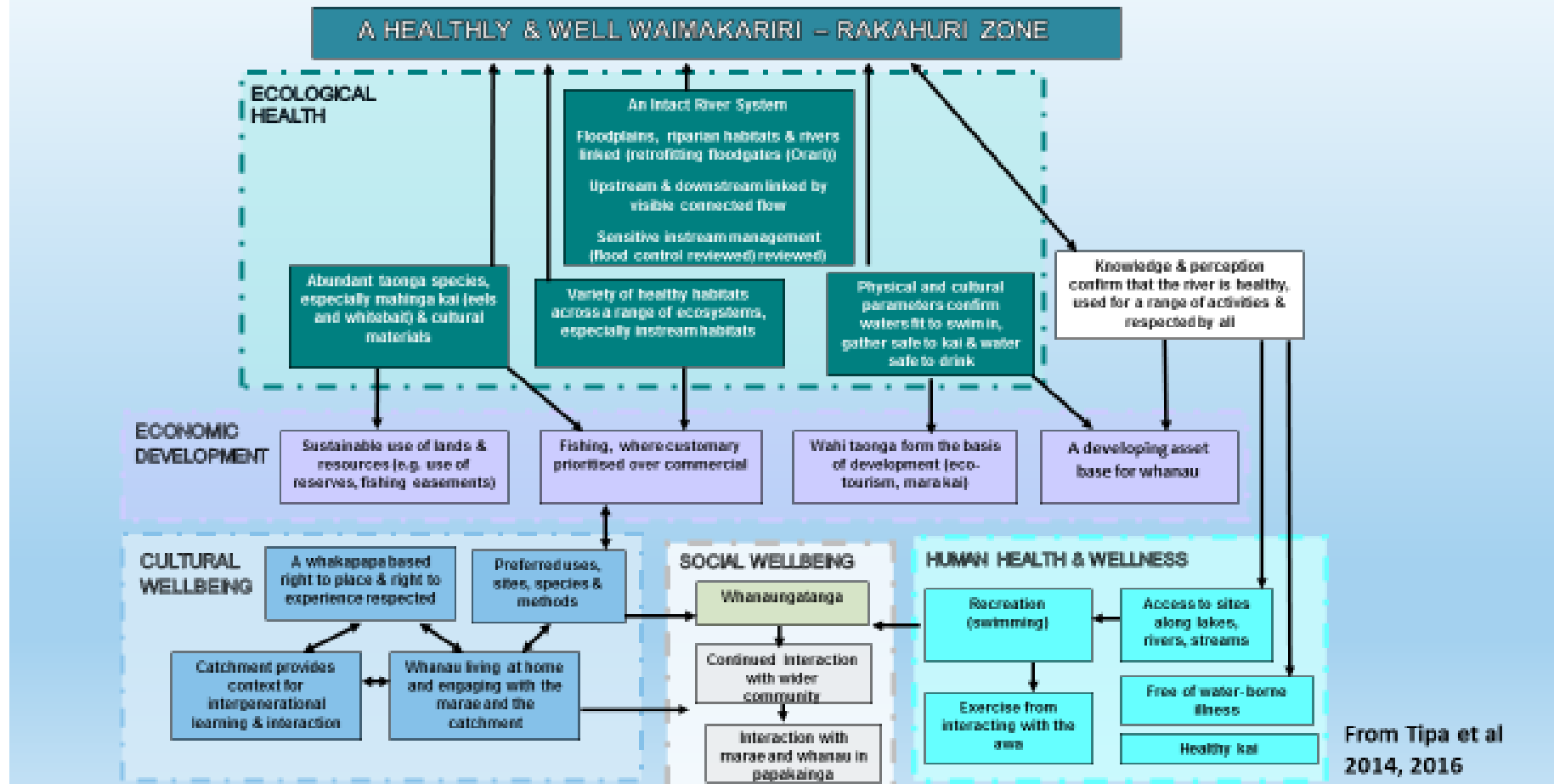


Figure 3: The Vision for the Zone

CHAPTER 3: RESULTS OF THE ASSESSMENTS & SUMMARY OF WHANAU ASPIRATIONS

3.1 Introduction

in this section we follow a standard format. We have broken the Rakahuri into river segments consistent with ki uta ki tai. We provide an overview for the segment and the results of the assessments for the sites within that segment. We have classed the streams outside the Rakahuri into a section called “Waimakariri lowland streams”

3.2 Rakahuri headwaters

TE MOEMOEAE

Ensure the Solutions package for the Waimakariri zone includes provisions that:

- Protect those parts of the upper Rakahuri including the gorge and parts of the Okuku River, that contain indigenous forests. Native vegetation is to be retained.
- The gorge and braided river sections of Ashley River are classed as significant regional landscape features (Boffa Miskell and Lucas Associates, 1993). This landscape is to be protected.
- Wetlands are to be protected.
- Source waters are to be identified and protected.
- No degradation of water quality of headwater tributaries and mainstem upper Rakahuri.
- Plantation forestry on the upper catchment will be managed over time (as it is harvested) recognising that forestry intercepts flow.
- Indigenous populations of taonga species in the upper catchment are prioritised.
- Investigate options to increase populations of taonga species, especially abundant mahinga kai, which are to be restored across their historic range
- No further hydrological alteration unless it is to improve flows and water quality, and is undertaken with the agreement of the runanga
- Protect known habitats for eels – e.g. upper Okuku
- Protect flows needed to sustain recreation e.g. kayaking, swimming, kai gathering.
- Restore indigenous vegetation on riparian margins

CHALLENGES FROM THE PERSPECTIVE OF TE NGAI TUAHURIRI RUNANGA

- Vegetation clearance led to erosion and sediment inputs to the river.
- Fish recruitment issues (because of downstream dewatered reaches)
- Risks associated with flow augmentation via inter-catchment transfers
- Loss of access due to private ownership.
- Risk of storage in the headwaters.
- Risk of inappropriate land uses. Large areas of the upper catchment are used for extensive pastoral farming. High natural erosion rates have been accelerated by removal of forest. As a result, parts of the catchment are now unsuitable for livestock. Lees Valley is recently developed farmland, on what was a red tussock swampland.

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A. Rakahuri – Ashley Gorge

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> The river remains easily accessed from the reserve. It is heavily used by whanau over summer months for a range of uses. There is a good clear, high quality flow of water that supports whanau use. Recreational and cultural use is prioritized at this site. The Rakahuri is in a state that the whanau from Te Ngai Tuahuriri are proud of. It adds to their sense of wellbeing. 	<p>TAONGA SPECIES (whole catchment not just this site)</p> <table border="0"> <tr> <td>Inanga</td> <td>Common bully</td> </tr> <tr> <td>Long fin eel</td> <td>Torrentfish</td> </tr> <tr> <td>Short fin eel</td> <td>Upland bully</td> </tr> <tr> <td>Flounder</td> <td>Blue gill bully</td> </tr> <tr> <td>Canterbury galaxiis</td> <td>Five finger</td> </tr> <tr> <td>Pittasporum</td> <td>Ti kouka</td> </tr> <tr> <td>Beech</td> <td></td> </tr> </table>	Inanga	Common bully	Long fin eel	Torrentfish	Short fin eel	Upland bully	Flounder	Blue gill bully	Canterbury galaxiis	Five finger	Pittasporum	Ti kouka	Beech	
Inanga	Common bully														
Long fin eel	Torrentfish														
Short fin eel	Upland bully														
Flounder	Blue gill bully														
Canterbury galaxiis	Five finger														
Pittasporum	Ti kouka														
Beech															
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> The Rakahuri is the river central to the identify of whanau from Te Ngai Tuahuriri Clear water The gorge itself The native vegetation around the gorge. The volume of water that provides a range of recreational opportunities. 	<p>THREATS</p> <ul style="list-style-type: none"> Although there is a lot of native vegetation, a range of exotic trees and weeds are present. Algae growth was observed mid-year, not just the summer months. Facilities need to be assessed for any potential impact on the waterway. Augmented flows that supply water for irrigation could make the flows at this site unsafe for summer users. 														

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-1	3.3	3.01

- It receives an above average cultural use score reflecting the ease of access and range of uses
- It has a lower than expected health score as some health indicators scored slightly below average including water quality and presence of weeds. Whanau suspected that the water quality although clear was not as good as it should be for a site this far upstream.
- Whanau believed that the dewatered downstream has the potential to impact the recruitment of migratory fish species to this part of the catchment

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<ul style="list-style-type: none"> The site exceeds the fine sediment cover set in the LWRP. The annual maximum temperature failed to meet target in the LWRP at least once Total suspended sediment is not an issue at this site. 	<ul style="list-style-type: none"> E-coli is below the standard <ul style="list-style-type: none"> The quality of water is suitable for contact recreation. The trigger level of 550 (which requires action) was triggered once between 2011 – 2015)

NUTRIENT		MCI
<ul style="list-style-type: none"> For NNN, is in the A band for protection of biodiversity from nitrate toxicity. For Ammonia - B band for protection of biodiversity from toxicity. The LWRP target for median DIN concentrations was exceeded. <p>Going forward -</p> <ul style="list-style-type: none"> Levels in the LWRP are not to be lessened (weakened) There is to be 100% compliance with the thresholds in the LWRP. 	<ul style="list-style-type: none"> DRP below threshold TP below threshold TN below threshold 	<ul style="list-style-type: none"> In 2014 and 2015 the targets in the LWRP Failed to meet the target in 2011 – 2013 (and was classed as poor to fair). The overall average over the 5 years fails to meet the target.

RECOMMENDATIONS

FLOWS & ALLOCATION	WATER QUALITY BANDS				
	Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile	
<ul style="list-style-type: none"> All indicators receive a satisfactory score, not a maximum score, when the flow is 8 cumecs. Some indicators received a satisfactory score at a lower flow. The preferred minimum flow at this site <ul style="list-style-type: none"> An increased flow in the gorge needs to be sufficient to <ul style="list-style-type: none"> Enable depth for safe swimming by adults during the summer period Provide depth for use of non-motorized water craft e.g. kayaks etc enable a visible connected flow of water downstream to the coast, including a visible connected flow in the Rangiora reach. provide passage for migratory species – ki uta ki tai Variability is recommended noting that FRE3 is 11 cumecs. 	CURRENT	A	B	A	A
	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Restore water quality.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau do use this site and their safety has to be paramount.
- Determine the flows that needed to maintain a visible connected flow ki uta ki tai.
- Riparian planting is to be prioritised. A catchment management plan to reduce the expanse of willows is to be developed.

- Minimise impacts from landuses in the headwaters by establishing a larger buffer zone that is planted appropriately and fenced off.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Continue to work with Manawhenua on initiatives that involve storage or “new water” within the zone.
- Shingle management needs to be reviewed. It is unclear how dry reaches, low flows and flood control measures cumulatively impact fish habitat and fish populations.
- The impact of dewatered reaches on the composition of fish populations in this reach needs to be investigated.



A photo of a swimming hole at Ashley Gorge

WORK

B. Garry River

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> The amenity value of this river has been enhanced and it is attractive to visitors and conducive to use. The upper reaches continue to be used by recreators. High quality water is protected. The contribution of flows to the Ashley is protected. The linkages between this stream and the reserve awarded to Ngai Tahu whanau are restored and whanau are able to use the reserve. Koura and freshwater shrimp are gathered by whanau in the future. 	<p>TAONGA SPECIES</p> <p>Koura Long fin eel Freshwater shrimp Canterbury galaxiis</p>
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> The contribution of flows this tributary makes to the Ashley. The linkages between this stream and the reserve awarded to Ngai Tahu whanau. 	<p>THREATS</p> <ul style="list-style-type: none"> Weeds are excessive. Dewatering at low flow times.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	1.18	2.03

- This site is appalling*
- It is a disgrace.*
- It is a watercourse that should carry a good flow of water.
- It receives a poor score for cultural use and a below average health score. It is inaccessible. Has extensive willow growth. There is no little flow and no habitat. There is nothing to encourage cultural use.
- Flows in the mainstem Ashley and this stream will inhibit the movement of fish species.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.

OTHER ASSESSMENTS

WATER QUALITY	MCI	NUTRIENTS
<ul style="list-style-type: none"> The dissolved oxygen failed to meet target in the LWRP at least once 	<p>In 2015, the QMCI met the LWRP target</p>	<ul style="list-style-type: none"> DIN levels exceed thresholds in LWRP <p>Going forward -</p> <ul style="list-style-type: none"> Levels in the LWRP are not to be lessened (weakened) provided they are sufficient to protect koura. There is to be 100% compliance with the thresholds in the LWRP.

RECOMMENDATIONS

FLOWS	WATER QUALITY BANDS				
At Birch Hill the minimum flow is to be: <ul style="list-style-type: none"> • 100l/s provided this is sufficient for long fin eels. • If this flow is breach a step up to 1.4l/s is requested. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	A	A	A	A
	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Protect water quality. Prioritise retention of the “A” band classifications.
- Investigate the ways in which connections to and use of the reserve can be enabled.
- Maintain good flows in the stream. Investigate the contribution that this river makes to the variability in the mainstem Rakahuri
- Riparian planting is needed to replace the willows.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Monitor water quality, which will include ongoing cultural monitoring.



Looking downstream from the bridge on Birch Hill Road

C. Okuku River

TE MOEMOEA <ul style="list-style-type: none"> Water quality continues to support populations of koura and shrimp. Flows are restored and the amenity of the restored river attracts whanau to the catchment. This river is managed as part of a cultural landscape that includes the Garry, Ashley and the reserve. 	TAONGA SPECIES <ul style="list-style-type: none"> Inanga Kakahi Upland bully Freshwater shrimp koura
VALUED FEATURES <ul style="list-style-type: none"> High quality of water. 	THREATS <ul style="list-style-type: none"> Low flows Abstraction Willow growth

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	1.88	1.67

- It is in a disgusting state*
- I feel sad seeing the river like this.*
- It is heavily overgrown by willows which will prevent cultural use.
- It receives a poor cultural use score and a poor health score.
- All health indicators scored poorly.
- There appears to be a diversion on the south side.
- Very little water is visible.

OTHER ASSESSMENTS

WATER QUALITY	MCI	NUTRIENTS
The dissolved oxygen failed to meet target in the LWRP at least once	There is only one QMCI assessment. In 2015 it met the LWRP target.	<ul style="list-style-type: none"> DIN levels exceed thresholds in LWRP

RECOMMENDATIONS

FLOWS	WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> Nutrient levels in the LWRP are not to be lessened (weakened) provided they are sufficient to protect koura, kakahi and freshwater shrimp. There is to be 100% compliance with the thresholds in the LWRP. At Fox Creek the minimum flow is to be at least 650l/s	Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile	
	CURRENT	A	A	A	A
	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Protect water quality. Prioritise retention of the “A” band classifications.
- Investigate the ways in which connections to and use of the reserve can be enabled.
- Increase the flows in the stream. Investigate the contribution that this river, like the Garry, makes to the variability in the mainstem Rakahuri
- Riparian planting is needed to replace the willows.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Monitor water quality, which will include ongoing cultural monitoring.

Looking towards the river (below) looking down into the channel (bottom photo)



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3.3 Rakahuri mid-catchment

TE MOEMOEA

Ensure the Solutions package includes provisions that:

- Protect wetlands
- Protect river and tributaries from impacts of arable agriculture, horticulture, dairying and "rural lifestyle" small-holdings (usually less than 10 ha).
- Protect river and tributaries from impacts of urban development. Rangiora is near the river. Waikuku Beach settlement is near the estuary. A heavily-used camping ground is at the mouth of Ashley Gorge.
- Protect the river from changes in land use: No further landuse intensification is supported.
- Allocation of both groundwater and surface water is not to increase. Whanau prioritise restoration of the quantity and quality of water.
- Reestablishment of indigenous vegetation on riparian margins throughout the catchment and the removal of willows.
- Set water quality standards and flows in this reach that provide for whanau use.
- Prioritise biodiversity and mahinga kai through improved river flows and reconnection of tributaries and the mainstem.
- Protect habitats known to sustain populations of taonga fish species, especially eels.
- Protect existing spring heads on farmland by retiring land around the springhead and shading by indigenous species.
- Discontinue inappropriate land use on floodplains and river margins;
- Examine flood protection infrastructure and retrofit where necessary to ensure does not compromise fish passage;
- Restore access to and use of customary fishing sites, reserves, easements and Maori land;
- Ensure activities in the beds and margins of waterways protect mahinga kai, including enabling fish passage.
- Minimise sources of gravel and sediment that is unnaturally accumulating in the river
- Fund the removal of willow across the catchment.

CHALLENGES FROM THE PERSPECTIVE OF TE NGAI TUAHURIRI RUNANGA

- Mainstem runs dry (or carries flood flows only)
- There is already excessive extraction but there remains increasing pressure to irrigate further land
- Mahinga kai habitats have been lost.
- Inappropriate instream management practices – diggers, spraying, gravel extraction etc.
- Culverts and flood gates can impede passage of fish.
- Reduced numbers of mahinga kai species
- Reduced habitats, which could be due to the loss of wetlands and springs in the catchment.
- Concern at risks of pollution from further land intensification (e.g. dairy farms)
- Connections have been impacted by the construction of flood control infrastructure, diversions, extractions
- Waterways impacted by inappropriate use of fertilisers etc
- The withdrawal of water (from both groundwater and surface water) for irrigation purposes may exacerbate low flows in the river.
- Large floods are needed periodically to re-work instream gravels.
- Use of off-road vehicles, especially near the town of Rangiora, impacts the river and may disturb breeding birds.
- Introduced weeds dominate the river bed below the gorge.
- Excessive willow growth prevents access to the river in places.

WORKING DRAFT

D. RAKAHURI AT MOUNT THOMAS

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Connectivity – ki uta ki tai and from river channel to flood plain. • The braided character of the river is restored. • Connectivity at key life cycle times for migratory species • Improved water quality • Summer flows that sustain aquatic life • Use of the river is possible – especially for swimming - during summer months. • The Rakahuri is in a state that the whanau from Te Ngai Tuahuriri are proud of. It adds to their sense of wellbeing. 	<p>TAONGA SPECIES (whole Rakahuri catchment not just this site)</p> <table border="0"> <tr> <td>Inanga</td> <td>Common bully</td> </tr> <tr> <td>Long fin eel</td> <td>Torrentfish</td> </tr> <tr> <td>Short fin eel</td> <td>Upland bully</td> </tr> <tr> <td>Flounder</td> <td>Blue gill bully</td> </tr> <tr> <td>Canterbury galaxiis</td> <td></td> </tr> </table>	Inanga	Common bully	Long fin eel	Torrentfish	Short fin eel	Upland bully	Flounder	Blue gill bully	Canterbury galaxiis	
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<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • The Rakahuri is the river central to the identify of whanau from Te Ngai Tuahuriri • Wide open river channel • Braided character • Should be the water quality 	<p>THREATS</p> <ul style="list-style-type: none"> • Eroding river banks • Low flows during summer – risk of dewatering and fish stranding • River runs dry during key fish migration periods • Limited in-stream habitats • Algal blooms • Excessive weeds on the river margin 										

CULTURAL ASSESSMENT

Site Status	Cultural use	Health measure
A-0	2.5	2.5

- While there may be kai species present, risk from weeds and algae may prevent use at times that whanau want to use the river.
- Access is possible.
- Whanau may want to use the river, especially during summer, but the condition of the river does not support cultural use.
- The majority of cultural health indicators receive an average score.

OTHER ASSESSMENTS

NUTRIENTS	WATER QUALITY BANDS				
Going forward -		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
<ul style="list-style-type: none"> • Levels in the LWRP are not to be lessened (weakened). • There is to be 100% compliance with the thresholds in the LWRP. 	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Improve weed management
- Plant native plants to attract birds – include the planting of flaxes for weavers to use
- Maintain flow that affords swimming for a range of different ages, including adults
- Agree summer flows that restore a braided character.
- Identify the flows needed to maintain a visible connected flow ki uta ki tai



The Rakahuri (at Rangiora) in flood

WORK

E. RAKAHURI (RANGIORA)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Connectivity – ki uta ki tai and from river channel to flood plain. • The braided character of the river is restored. • Connectivity at key life cycle times for migratory species • Improved water quality • Summer flows that sustain aquatic life • Use of the river is possible – especially for swimming - during summer months. 	<p>TAONGA SPECIES (whole Rakahuri catchment not just this site)</p> <table border="0"> <tr> <td>Inanga</td> <td>Common bully</td> </tr> <tr> <td>Long fin eel</td> <td>Torrentfish</td> </tr> <tr> <td>Short fin eel</td> <td>Upland bully</td> </tr> <tr> <td>Flounder</td> <td>Blue gill bully</td> </tr> <tr> <td>Canterbury galaxiis</td> <td></td> </tr> </table>	Inanga	Common bully	Long fin eel	Torrentfish	Short fin eel	Upland bully	Flounder	Blue gill bully	Canterbury galaxiis	
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<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • The Rakahuri is the river central to the identify of whanau from Te Ngai Tuahuriri • Wide open river channel • Braided character • Should be high water quality • The Rakahuri is in a state that the whanau from Te Ngai Tuahuriri are proud of. It adds to their sense of wellbeing. 	<p>THREATS</p> <ul style="list-style-type: none"> • Low flows during summer – risk of dewatering and fish stranding • River runs dry during key fish migration periods • Limited in-stream habitats • Algal blooms • Excessive weeds (lupins, willows, broom) on the river margin • Infrastructure maintenance (e.g. diverting the river to maintain the piles). 										

CULTURAL ASSESSMENT

Site Status	Cultural use	Health measure
A-0	2.25	2.37

- Whanau may want to use the river, especially during summer, but the condition of the river does not support cultural use. Algal blooms are a concern.
- The majority of cultural health indicators receive a slightly below average score.
 - Water quality concerns
 - Limited habitats
 - Weeds in riparian margin and a need to reintroduce native plants.

OTHER ASSESSMENTS

WATER QUALITY	MCI
<ul style="list-style-type: none"> • The dissolved oxygen failed to meet target in the LWRP at least once • The target in the LWRP for average fine sediment cover is exceeded. • Annual maximum temperature failed to meet LWRP target at least once • Dissolved oxygen failed to meet LWRP target at least once • DO average over last five years failed to meet LWRP target 	<p>There are only two QMCI assessments and they both met the LWRP target.</p>

RECREATION	NUTRIENTS
<ul style="list-style-type: none"> Was rated as “fair” Potential for cyanobacteris in the Lower River to pose a health risk Is rated as suitable for contact recreation 	<ul style="list-style-type: none"> Median DIN levels exceed thresholds in LWRP

RECOMMENDATIONS

NUTRIENTS	WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> Levels in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	A	A	A	A
	WHANAU PREFERENCE	A	A	A	A
FLOWS					
At Rangiora Traffic Bridge the minimum flow is to be <ul style="list-style-type: none"> Sufficient to maintain a visible connected flow ki uta ki tai. If this flow is breach a step up is requested. 					

MANAGEMENT PRIORITIES

- Protection of the “A” bands.
- Identify the flows needed to maintain a visible connected flow ki uta ki tai
- Improved weed management
- Review of the willow management programme
- Plant native species on the riparian margins – include flaxes for weavers to use
- Maintain flows that provide a good swimming depth (including for adults) and of high quality. At present the Council artificially constructs swimming holes. The river should do this naturally if the flows are restored.

“When my kids were growing up this river was their playground but we are unable to gather kai or swim or picnic during the summer because of the recurrence of algal blooms”

3.4 Rakahuri lower-catchment

TE MOEMOEA

Ensure the Solutions package includes provisions that:

- Restore abundant taonga species' populations, especially eel fishery
- Reconstruct historic hydrological connections including re-establish lost wetlands – using historic distributions as a reference
- Restore and protect inanga spawning sites
- Enhance water quality to make it a desirable place to visit, gather from, and for whanau to enjoy
- Protect habitats known to sustain populations of taonga fish species.
- Restore Taranaki Stream, a tributary of the estuary, which remains an important whitebait fishing area. This requires reconstruction of the stream through establishment of riparian areas and restoration of the stream to original shape and levels; and retrofitting the Taranaki floodgate;
- Agree with manawhenua and implement a management plans for protecting and or restoring other tributaries of high use value: Saltwater Creek; Waikuku Stream; Te Wera Wera (Little Ashley Stream); Harris's Creek; and Smarts Road Creek;
- Control land use on or near river margins and floodplain, including prohibiting intensive grazing, silage pits, offal pits, subdivision on the margins and the floodplain;
- Prohibit stock access along the Taranaki Creek between Waikuku Beach and Kaiapoi pā
- Fence the full length of tributaries.
- Ensure the physical connection between the Rakahuri, Taranaki stream, Tūtaepatu, Taerutu and the Waimakariri River is restored and able to provide fish passage;
- Examine flood protection infrastructure and retrofit where necessary to ensure fish passage;
- Plant buffers along the river and tributaries to protect water quality;
- Restore access to and use of customary fishing sites, reserves, easements and Maori land;
- Ensure activities in the beds and margins of the river and its tributaries protect mahinga kai,
- Identify and protect Kōhanga
- Prohibit any further drainage of existing wetlands.
- Restore wetlands in the catchment as a priority, using the historic distribution as a reference.
- Restore the flow and character of Taerutu stream and lagoon as a wetland of cultural significance.
- Manage Tūtaepatu Lagoon as a wetland of immense cultural importance.
- Reconnect Taerutu is a lagoon/swamp area next to Kaiapoi pā, with tributaries in the lower catchment.

CHALLENGES FROM THE PERSPECTIVE OF TE NGAI TUAHURIRI RUNANGA

- Concern at managing for the “wrong reason”. From the late 1800's the Rakahuri has been managed with an emphasis on flood control and land preservation rather than mauri or mahinga kai.
- Concern at risks of pollution from increased land intensification
- Contamination of kai without any warning signs being present to advise gatherers.
- Hydrology altered – diverted, drained, dewatered etc. The withdrawal of water (from both groundwater and surface water) for irrigation purposes has a compounding effect and may exacerbate low flows in the river.
- Mahinga kai habitats have been lost and others are under pressure.
- Inappropriate instream management practices – diggers, spraying etc.
- Increased periphyton growth creating nuisance and making sites unattractive for users.
- Increasingly unsafe water quality as move downstream inhibits use.
- Loss of wetlands, springs, loss of connectivity, loss of access due to private land ownership.
- Large floods are needed periodically to re-work gravel surfaces. The extraction of gravel and maintenance of flood protection works cause unnatural disturbance.

WORKING DRAFT

F. Rakahuri – State Highway One

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> Improved water quality Summer flows sustain aquatic life Whitebaiting continues to be a significant activity undertaken by whanau. Habitats, including spawning habitats are restored. Use of the river possible during summer months as a result of improved flows and improved water quality. The amenity of the river is improve whanau use the river for a range of cultural purposes. The lower river is restored as a significant cultural landscape and connections to the reserve are restored. The Rakahuri is in a state that the whanau from Te Ngai Tuahuriri are proud of. It adds to their sense of wellbeing. 	<p>TAONGA SPECIES (whole Rakahuri catchment not just this site)</p> <table> <tr> <td>Inanga</td> <td>Common bully</td> </tr> <tr> <td>Long fin eel</td> <td>Torrentfish</td> </tr> <tr> <td>Short fin eel</td> <td>Upland bully</td> </tr> <tr> <td>Flounder</td> <td>Blue gill bully</td> </tr> <tr> <td>Canterbury galaxiis</td> <td></td> </tr> </table>	Inanga	Common bully	Long fin eel	Torrentfish	Short fin eel	Upland bully	Flounder	Blue gill bully	Canterbury galaxiis	
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<p>VALUED FEATURES</p> <ul style="list-style-type: none"> The Rakahuri is the river central to the identify of whanau from Te Ngai Tuahuriri Braided river Whitebaiting Should be high water quality 	<p>THREATS</p> <ul style="list-style-type: none"> Stopbanks break connections Fish strandings are a risk due to low summer flows. Algal blooms <i>“these occur every year so we are unable to use the river over the summer months- we can’t even take the dog to the river”</i> 										

CULTURAL ASSESSMENT

Site Status	Cultural use	Health measure
A-0	2.25	1.93

- As with the other mainstem sites, the river does not sustain cultural use at times when whanau may want to use the river, especially during summer
 - Algal blooms were raised as a concern.
- The majority of cultural health indicators receive a slightly below average score.
 - Eroding riverbanks are evident. In some places whanau described it as severe erosion.
 - Water quality concerns
 - Limited habitats
 - Weeds in riparian margin and a need to reintroduce native plants.
 - Modification of channel and riparian margin (stopbanks).

OTHER ASSESSMENTS

WATER QUALITY	MCI
<ul style="list-style-type: none"> Met the LWRP target for fine sediment. Annual maximum temperature failed to meet LWRP target at least once Annual dissolved oxygen failed to meet LWRP target twice since 2011. Average dissolved oxygen failed to meet LWRP target. 	<p>There mean for the scores 2011 - 2015 fails to meet LWRP</p>

RECREATION	NUTRIENTS
<ul style="list-style-type: none"> The “Suitable for Recreation Grade” was rated as “fair” Potential for cyanobacteria in the Lower River to pose a health risk 	<ul style="list-style-type: none"> Median DIN levels exceed thresholds in LWRP

RECOMMENDATIONS

NUTRIENTS	WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> Levels in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	A	A	A	A
	WHANAU PREFERENCE	A	A	A	A

FLOWS

Since July 2014, the frequency and size of flood events (3X median) has been markedly lower.

At the State Highway Bridge the minimum flow is to be

- Summer - sufficient to maintain a visible connected flow provided this is sufficient to protect native fish (especially inanga and eels). If this flow is breach a step up (of at least 250 l/s) is requested.
- Winter – sufficient to a visible connected flow and a braided river

MANAGEMENT PRIORITIES

- Recreate habitats (e.g. wetlands have been filled in. Runange would like to work with Ecan to identify opportunities to recreate)
- Shingle management needs to be reviewed. It is unclear how dry reaches, low flows and flood control measures cumulatively impact fish habitat and fish populations.
- Improved weed management.
- Review of the willow management programme
- Plant natives on the riparian margins – include flaxes for weavers to use
- Agree to a water quality standard that means water is safe for swimming
- Increase summer flows that improve water quality and support whanau use.



The Ashley in flood. Whanau want to see flow variability set in the flow regime. Flood management practices need to consider instream needs.

G. Raupo Berm (Lower Rakahuri)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> Improved water quality Summer flows sustain aquatic life Whitebaiting continues to be a significant activity undertaken by whanau. Habitats, including spawning habitats are restored. Use of the river possible during summer months as a result of improved flows and improved water quality. The amenity of the river is improve whanau use the river for a range of cultural purposes. The lower river is restored as a significant cultural landscape and connections to the reserve are restored. The Rakahuri is in a state that the whanau from Te Ngai Tuahuriri are proud of. It adds to their sense of wellbeing. 	<p>TAONGA SPECIES (whole Rakahuri catchment not just this site)</p> <table> <tr> <td>Inanga</td> <td>Common bully</td> </tr> <tr> <td>Long fin eel</td> <td>Torrentfish</td> </tr> <tr> <td>Short fin eel</td> <td>Upland bully</td> </tr> <tr> <td>Flounder</td> <td>Blue gill bully</td> </tr> <tr> <td>Canterbury galaxiis</td> <td></td> </tr> </table>	Inanga	Common bully	Long fin eel	Torrentfish	Short fin eel	Upland bully	Flounder	Blue gill bully	Canterbury galaxiis	
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<p>VALUED FEATURES</p> <ul style="list-style-type: none"> The Rakahuri is the river central to the identify of whanau from Te Ngai Tuahuriri Braided river Whitebaiting Should be high water quality 	<p>THREATS</p> <ul style="list-style-type: none"> Stopbanks break connections Low summer flows are of concern Fish strandings are a risk due to low summer flows. Algal blooms occur every summer. Water quality does not support cultural use. 										

CULTURAL ASSESSMENT

Site Status	Cultural use	Health measure
A-0	2	2.25

The lower health score reflects

- the level of modification at this site; stopbanks and river diversion have impacted cultural use of the site.
- The extensive erosion on the banks on the north side where the Waimakariri Council filled in the wetland. *"Now it is eroding dramatically"*.

Management Priorities

- Agree a plan that restores opportunities for whanau to use waterways
- Improved weed management (lupin, broom, willows)
- Plant natives on the riparian margins – include flaxes for weavers to use
- Agree summer flows that improve water quality and support whanau use.
- Develop and implement a programme to restore the cultural landscape that includes a plan to restore use of the reserve.

Where the park is now was all wetlands will the Catchment Board filled them in

This site has obstructed the use of our beneficial right to the Fenton Reserve and the connection to Te Aka Aka which is an inherited right ... by building stopbanks and diverting the river away from this fishing reserve.



Sediment concerns in the lower Rakahuri



Looking across the river at the Raupo Berm

H. Taranaki Stream (Kaiapoi, Preece Road)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> Established riparian planting downstream. Good flows of clear water are required year round. Respect that this is a tapu site – there is to be no use. The community is to protect this status. This is part of a highly valued cultural landscape that is to be reconstructed and protected. The residual population of long fin tuna are to be protected. 	<p>TAONGA SPECIES</p> <table border="0"> <tr> <td>Koura</td> <td>NZ scaup</td> </tr> <tr> <td>Short fin eels</td> <td>Other waterfowl</td> </tr> <tr> <td>Long fin eels</td> <td>Open water divers</td> </tr> <tr> <td>Common bully</td> <td>Marsh crake</td> </tr> <tr> <td>Canterbury galaxiis</td> <td>Gulls, terns, swamp rails</td> </tr> <tr> <td>Inanga</td> <td></td> </tr> </table>	Koura	NZ scaup	Short fin eels	Other waterfowl	Long fin eels	Open water divers	Common bully	Marsh crake	Canterbury galaxiis	Gulls, terns, swamp rails	Inanga	
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Canterbury galaxiis	Gulls, terns, swamp rails												
Inanga													
<p>VALUED FEATURES WAHI TAONGA – INCL. TAONGA SPECIES</p> <ul style="list-style-type: none"> Taranaki Creek is part of a highly valued cultural landscape. Although not classed as wai tapu, this stream through and around wahi tapu sites. 	<p>THREATS</p> <ul style="list-style-type: none"> Weeds are present Flow could be artificially high because of augmentation of groundwater levels by irrigation If augmentation is occurring there is a risk of contamination by nitrates. The river was diverted in the past – it used to flow on the east side of Kaiapoi and through Taerutu – connections needs to be re-established. Connection to downstream habitats is an issue because of the Taranaki floodgate. 												

CULTURAL ASSESSMENT

Site Status	Cultural use	Health measure
A-0	0	2.75

- It is a modified watercourse (channel diverted) that still carries natural waters.
- It receives a mahinga kai score of 0 which reflects no gathering which is consistent with its history and its association with sites that are wahi tapu. It is shaded red because a significant diversion of its river channel is not recognising and providing for its status.
- A range of health indicators received average scores including water quality, riparian cover, and presence of exotics. Riparian planting is only in a small area. It needs to be contiguous for the length of the stream.

OTHER ASSESSMENTS

WATER QUALITY	MCI & MACROPHYTES
<ul style="list-style-type: none"> The dissolved oxygen failed met target in the LWRP The target in the LWRP for total fine sediment cover is exceeded every year. The target in the LWRP for average fine sediment cover is exceeded Annual maximum temperature met LWRP target Dissolved oxygen met LWRP target TSS is not an issue at this site. 	<p>QMCI target field each year.</p> <p>Failed to meet target for total macrophyte cover.</p> <p>Failed to meet target for emergent macrophyte cover.</p>

RECREATION	NUTRIENTS
<ul style="list-style-type: none"> Was rated as “fair” Met LWRP target for cyanobacteris since 2011 E-coli levels were above. The MFE/MOH action level was breached regularly 2011-2016. 	Levels are high enough to cause nuisance algal growth (70% probability)

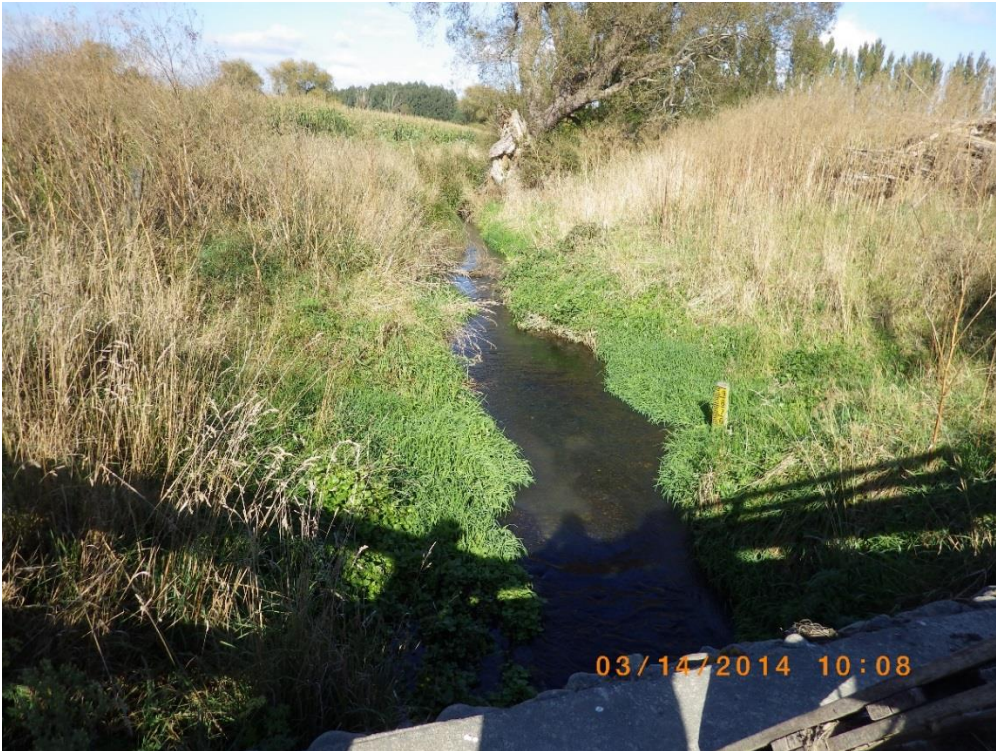
RECOMMENDATIONS

NUTRIENTS	WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened) provided they are strong enough to protect this stream for koura and inanga. There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	A	B	B	**1
	WHANAU PREFERENCE	A	A	A	A
FLOWS					
The minimum flow is to be at least 120l/s provided this is sufficient to restore the stream as a kohanga for inanga and other native species (eels especially). Spawning habitat is to be protected.					
There is to be no further allocation of water from Taranaki stream or connected groundwater.					

Management Priorities

- Work with whanau to identify and protect the spring heads that feed this creek.
- Develop a whole of catchment management plan for this creek.
- Enhance the water quality to “A” band which is appropriate for a stream of this cultural significance.
- Reconstruct connections to other waterways using the historic patterns as a starting point. For example Taranaki Stream is to flow on the east side of the Kaiapoi reserve.
- Connect this site with downstream reaches via the Taranaki floodgate retrofit.
- Establish a reasonable sized buffer between Taranaki Stream and the adjacent lands. Plant vegetation on at least one side of the creek (but preferably both sides) to provide shelter and cover for the river channel.
- Monitor water quality, which will include ongoing cultural monitoring. This is to ensure that water is not nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Agree a protocol with Te Ngai Tuahuriri Runanga that stipulates that there will be no machinery such as diggers working instream at this tapu site. Only hand maintenance is supported.
- Consents in this catchment should not be processed non-notified.

¹ ** means the site was unrated



Taranaki Stream
(Kaiapoi Pa) Looking
upstream

- Channel is open with grasses at the stream edge.
- Water was clear.



Taranaki Stream
(Kaiapoi Pa) Looking
downstream from
Preece Road.

- Riparian planting established on one side.
- Water was clear.
- Kaiapoi Pa is to the right – historically it would have been to the left.

“This site could be really nice”

I. Taranaki Stream (Pa Road)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Access is to be improved. • Kaiapoi Pa is to be connected to the Rakahuri via Taranaki Stream. • There is to be only indigenous vegetation • Weed is to managed and not clog the waterway. • Good quality water (that is not nutrient enriched) is to be maintained in Taranaki Stream. • There is to be a buffer created between Taranaki Stream and adjacent landuses, The buffer is to be planted in a mix of indigenous grasses, shrubs, and trees. Willows and broom are to be replaced. • Indigenous vegetation is needed to attract back birdlife. • The connections within this cultural landscape are to be restored. 	<p>TAONGA SPECIES</p> <table> <tr> <td>Koura</td> <td>NZ scaup</td> </tr> <tr> <td>Short fin eels</td> <td>Other waterfowl</td> </tr> <tr> <td>Long fin eels</td> <td>Open water divers</td> </tr> <tr> <td>Common bully</td> <td>Marsh crake</td> </tr> <tr> <td>Canterbury galaxiis</td> <td>Gulls, terns, swamp rails</td> </tr> <tr> <td>Inanga</td> <td></td> </tr> </table>	Koura	NZ scaup	Short fin eels	Other waterfowl	Long fin eels	Open water divers	Common bully	Marsh crake	Canterbury galaxiis	Gulls, terns, swamp rails	Inanga	
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Inanga													
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • Taranaki Creek is part of a highly valued cultural landscape. Although not classed as wai tapu, this stream through and around wahi tapu sites. 	<p>THREATS</p> <ul style="list-style-type: none"> • The site smells • Weeds can choke the channel • There are concerns about the oxygen levels for instream species. • The water could be artificially augmented by irrigation bywash and be nutrient enriched. • Water sometimes appears milky. • Willows and other indigenous vegetation could choke the river. • Adjacent landuse is too close to the river. A greater setback that is planted out in indigenous vegetation is needed. • There is a nearby silage pit / rubbish tip that whanau suspect is leaching to the river. The risk of any legacy contaminants is unknown. • Noticeable drops in river level can be observed over a year. 												

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	0	1.64

- This is a modified watercourse that carries natural waters.
- It receives an zero mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of exotics, sediment.

Management Priorities

- Enhance water quality. Nutrient enriched water is not supported.
- Reconstruct connections to other waterways using the historic patterns as a starting point. For example Taranaki Stream is to flow on the east side of the reserve.
- Connect this site with downstream reaches via the Taranaki floodgate retrofit.
- Plant vegetation on at least one side to provide shelter and cover for the river channel.
- Establish a reasonable sized buffer between Taranaki Stream and the adjacent lands.
- Monitor water quality, which will include ongoing cultural monitoring. This is to ensure that water is not nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol.
- Consents in this catchment should not be processed non-notified.



Taranaki Stream - Looking downstream

- Channel is open with grasses at the stream edge.
- Water was clear but choked with weeds
- Was introduced plants with very few natives
- The fencing is close to the waters edge.



Taranaki Stream - Looking upstream

- Channel is open with grasses at the stream edge.
- Water was clear but choked with weeds
- Was introduced plants with very few natives
- It is unknown whether or not the waters are nutrient enriched.

“It is weedy... It stinks...We don’t want nutrient enriched water”

I. Taranaki Stream (Waikuku Beach Road)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> This site is a kohanga with a lot of small eels present. Management should reflect its importance as an eel fishery. Kaiapoi Pa is to be connected to the river via Taranaki Stream. There is only to be indigenous vegetation There is to be no noticeable decline in water quality from Kaiapoi Pa to this site. All three streams that converge at this site are to carry good quality water. There is to be a visible flow of water. Some trees are to be interspersed between the flax and grasses to provide cover. This site is to managed as a floodplain rather than as drained land suitable for farming or subdivision. Indigenous vegetation is to be planted to attract birds. 	<p>TAONGA SPECIES</p> <table> <tr> <td>Koura</td> <td>NZ scaup</td> </tr> <tr> <td>Short fin eels</td> <td>Other waterfowl</td> </tr> <tr> <td>Long fin eels</td> <td>Open water divers</td> </tr> <tr> <td>Common bully</td> <td>Marsh crake</td> </tr> <tr> <td>Canterbury galaxiis</td> <td>Gulls, terns, swamp rails</td> </tr> <tr> <td>Inanga</td> <td></td> </tr> </table>	Koura	NZ scaup	Short fin eels	Other waterfowl	Long fin eels	Open water divers	Common bully	Marsh crake	Canterbury galaxiis	Gulls, terns, swamp rails	Inanga	
Koura	NZ scaup												
Short fin eels	Other waterfowl												
Long fin eels	Open water divers												
Common bully	Marsh crake												
Canterbury galaxiis	Gulls, terns, swamp rails												
Inanga													
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> Taranaki Creek is part of a highly valued cultural landscape. Although not classed as wai tapu, this stream through and around wahi tapu sites. 	<p>THREATS</p> <ul style="list-style-type: none"> Weeds are present and dominate the river when flows are low. This stream is not cleaned as often as it should be. Little water movement was apparent when flows are low. Movement is restricted to a small part in the middle of the channel. There is some planting downstream but willows dominate the riparian margin. They need to be replaced with native plants. Water quality is not good. There are concerns about the risk to drinking water for nearby residents. 												

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.0	2.33

- It is a modified watercourse that carries natural waters.
- It receives an below average mahinga kai score and a below average health score.
- A range of health indicators scored slightly below average including water quality, riparian cover, presence of exotics, discolouration.

Management Priorities

- Enhance water quality. Te Ngai Tuahuriri notice a decline as you move down the stream. Deterioration is not supported.
- Reconstruct connections to other waterways using the historic patterns as a starting point. For example Taranaki Stream is to flow on the east side of the reserve.
- Connect this site with downstream reaches via the Taranaki floodgate retrofit.
- Plant vegetation on at least one side to provide shelter and cover for the river channel.

- Establish a reasonable sized buffer between Taranaki Stream and the adjacent lands.
- Monitor water quality, which will include ongoing cultural monitoring. This is to ensure that water is not nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Consents in this catchment should not be processed non-notified.



Taranaki Stream -
Looking upstream

- There are grasses at the stream edge.
- Willow gives limited shelter

It is unknown whether or not the waters are nutrient enriched.



Taranaki Stream -
Looking downstream

- Channel has riparian planting on one side offering some shade.
- Water was clear but can be discoloured.

“This has to be valued and managed as a floodplain”

K. Taranaki Stream (Floodgate)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Easy access is available from the road – access is to be maintained. • It currently sustains a mix of small fish and should continue to do so. • Spawning habitat is to be enhanced with connections to upstream spawning sites reestablished. • Fish are to have unimpeded passage upstream and downstream / to and from Taranaki stream. • Populations of fish in the estuary and in Taranaki are enhanced through improved movements. • This stream needs to be respected. 	<p>TAONGA SPECIES</p> <table> <tr> <td>Koura</td> <td>NZ scaup</td> </tr> <tr> <td>Short fin eels</td> <td>Other waterfowl</td> </tr> <tr> <td>Long fin eels</td> <td>Open water divers</td> </tr> <tr> <td>Common bully</td> <td>Marsh crake</td> </tr> <tr> <td>Canterbury galaxiis</td> <td>Gulls, terns, swamp rails</td> </tr> <tr> <td>Inanga</td> <td></td> </tr> </table>	Koura	NZ scaup	Short fin eels	Other waterfowl	Long fin eels	Open water divers	Common bully	Marsh crake	Canterbury galaxiis	Gulls, terns, swamp rails	Inanga	
Koura	NZ scaup												
Short fin eels	Other waterfowl												
Long fin eels	Open water divers												
Common bully	Marsh crake												
Canterbury galaxiis	Gulls, terns, swamp rails												
Inanga													
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • Taranaki Creek is part of a highly valued cultural landscape. Although not classed as wai tapu, this stream through and around wahi tapu sites. 	<p>THREATS</p> <ul style="list-style-type: none"> • Recruitment of species to the habitats upstream of the floodgate are a priority. • Whitebait spawning sites are to be identified and protected. • No water movement was apparent. It is stagnant upstream of the floodgate. • When the floodgates cause water to be backed up onto paddocks it washes contaminants down into the stream. • Flows are insufficient to restore mahinga kai populations. • The quality of the water is unknown but the fear is it could be quality enriched. • There are concerns about the risk to drinking water for nearby residents. • Rubbish that has been dumped at the site is regularly observed. 												

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-1	3.0	1.48

- It is a modified watercourse (floodgate) that carries natural waters.
- It receives an average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of exotics, sediment.

Management Priorities

- Set as a minimum flow, that ensures the length of the catchment is managed for natives species, especially as a kohanga for inanga.
- Taranaki Stream should be restored and managed as an inanga spawning tributary.

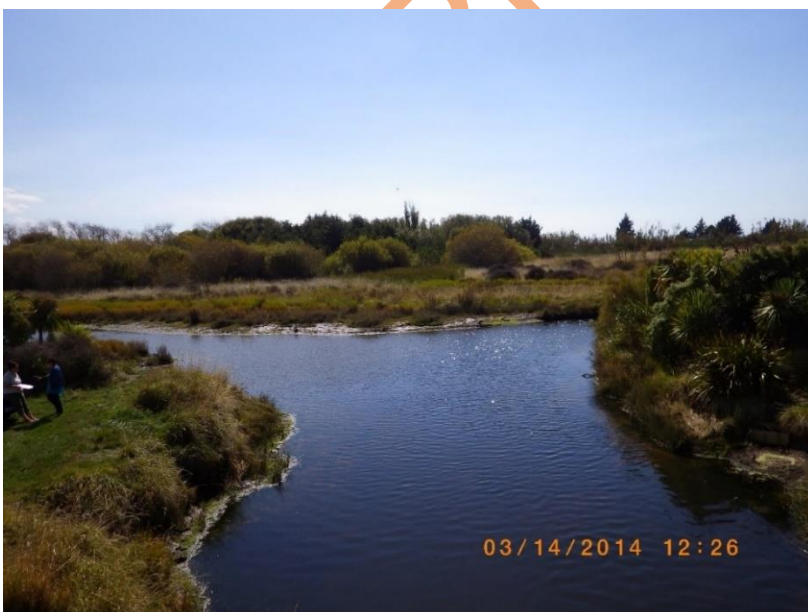
- Enhance water quality – the quality needs to be consistent with that upstream. There is to be no deterioration downstream of the pa.
- Minimise sediment inputs and impacts from adjacent landuse through retention of a sizeable buffer that is planted with indigenous shrubs and trees.
- Retrofit and redesign the flood gate to enable passage of fish species. Whanau want it opened permanently
- Monitor activity around the gate during the whitebait season
- Monitor water quality, which will include ongoing cultural monitoring. This is to ensure that water is not nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Consents in this catchment should not be processed non-notified.

“Leave it [the floodgate] open Let the fish go upstream....Reconnect the pa to the river”



Taranaki Stream - Standing on the floodgate looking upstream

- There are grasses at the stream edge. But this photos shows the difference in the approach of farmers to the size of buffer. The larger buffer on the true left of the river is supported.
- Further planting is needed in the buffer that has been set aside,



Looking below the floodgate to the channel

- Whanau are concerned at the lack of passage upstream
- This area is an important area for whitebait. Restoring access for fish species to their spawning sites upstream in the Taranaki Stream is recommended

It is unknown whether or not the waters are nutrient enriched.

L. Leggats Creek (Ashley Stopbank)

TE MOEMOEA

- Access is available from the road but is difficult – access is to be maintained.
- It currently sustains bullies and should continue to do so.
- Consistent year round flows in this stream are protected
- The gate is inspected to confirm that it is not a barrier to fish passage.
- The riparian buffer is increased in size and planted appropriately.

VALUED FEATURES

- Contributes reliable flows of water to the Lower Rakahuri
- The contribution from spring fed streams regulates the temperature and the DO in the Rakahuri.

THREATS

- Weeds are present but is cleaned by the Council. Whanau are reliant on the relationship with Council to ensure appropriate weed control.
- This stream appears to carry more water than other nearby streams. Whanau suspect it is augmented by irrigation water. The quality of water is unknown. Its reliable year round flow contrasts with flows in the past which were known to “dry up” on occasion.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-1	3.0	2.20

- It is a modified watercourse that carries natural waters.
- It receives an average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of exotics, sediment.

RECOMMENDATION

FLOWS

A flow regime is to be set for this river. It should be protected as a spring fed stream that provides flows to the lower Rakahuri.

- at least 90% of 7dMALF

NUTRIENTS

WATER QUALITY BANDS

Going forward -

- Levels in the LWRP are not to be lessened (weakened).
- There is to be 100% compliance with the thresholds in the LWRP.

	Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
WHANAU PREFERENCE	A	A	A	A

Management Priorities

- Maintain reliable year round stream flows.
- Investigate water quality to determine nutrient levels.
- Ensure high quality water quality

- Minimise sediment inputs and impacts from adjacent landuse. Fence off the riparian margin. Plant with indigenous species.
- Investigate the effect of the culvert, under different flow regimes, to ensure that it is not a barrier to fish passage.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol



Looking downstream

- Water appears clear
- Good flows are observed but it is unclear if these are augmented by irrigation – if they are, are the waters nutrient enriched?



Looking upstream

- A greater buffer between the stream and adjacent landuse is needed. It should be planted appropriately.

This could be a lovely stream if it was planted out and the margins widened.

M. Little Ashley (State highway)

TE MOEMOEA

- Easy access is available from the road – access is to be maintained.
- It currently sustains populations of tuna that are of reasonable size and should continue to do so.
- There is to be a good year round flow of water (which will contribute to flows in Leggat Creek as it is a tributary).
- Watercress is present and is to be safe to gather and eat.
- Good habitat is to be retained.
- The spring head is protected.

VALUED FEATURES

- When the Rakahuri is low or if there are warnings not to use it, whanau can gather from the Little Ashley.
- It carries good stocks of eels.

THREATS

- It ran dry 2014/2015
- Weeds are present on occasion. A larger buffer on the riparian margin is needed.
- Stock are too close to the river. Stock can get under the wire.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-1	4.0	1.98

- It is a modified watercourse that carries natural waters.
- It receives an above average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.

MANAGEMENT PRIORITIES

- Protect water quality.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau do use this site and their safety has to be paramount.
- Maintain good flows in the stream.
- Riparian planting is needed.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Whanau so not want to see the waters nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol

FLOW RECOMMENDATION

A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the lower Rakahuri. Whanau preference is 50l/s provided this is sufficient to protect eels.

N. Waikuku Stream (Waikuku Beach Road)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Access is improved. • The stream is restored to a state where it provides good quantities of high quality water to the lower Rakahuri • It continues to be a refuge for native fish when the lower Rakahuri is stressed. • The springs that feed this stream are protected 	<p>TAONGA SPECIES</p> <p>Freshwater shrimp Long fin eel Short fin eel Inanga Common bully Flounder</p>
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • The stream provides water to the lower Rakahuri and regulate it temperature when it is running low • It is a refuge for native fish when the lower Rakahuri is stressed. • The taonga species it sustains. 	<p>THREATS</p> <ul style="list-style-type: none"> • Stock are too near the stream. • There is limited riparian cover. • There are extractions that whanau believe are impacting the stream. • The stream is at risk from the effects of adjacent landuses.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	1.97	2.38

- *I would like to see more water*
- It is a modified watercourse that carries natural waters.
- It receives an above average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.
- Debris is visible in the river including old farm machinery.
- Stock are too close to the river.

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<p>Water quality is decreasing</p> <ul style="list-style-type: none"> • Failed to meet target for total fine sediment cover 2012 -2015 • Failed to meet the average for total fine sediment cover 2012 -2015 • Target for maximum temperature met. • Target for dissolved oxygen saturation met. • TSS is not an issue at this site. 	<p>Met the LWRP target for cyanobacteria.</p>
MCI & MACROPHYTES	
<ul style="list-style-type: none"> • Fails to meet the LWRP target for total macrophyte cover • Met the LWRP target for emergent macrophytes • QMCI target breached on three occasions • Average MCI target breached. 	

RECOMMENDATIONS

FLOW

A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the lower Rakahuri. Whanau preference is for the flow to be at least 600l/s

The flow needs to be sufficient to sustain the full range of native fish species, especially inanga (including inanga spawning sites) and eels.

NUTRIENT RECOMMENDATION	WATER QUALITY BANDS				
Going forward -		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
<ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened). 	CURRENT	A	A	B	**2
<ul style="list-style-type: none"> There is to be 100% compliance with the thresholds in the LWRP. 	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Restore the water quality.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau safety is paramount.
- Maintain good flows in the stream.
- Riparian planting is needed.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone – preferably 15m) that is planted and fenced off. Stock are to be excluded.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Whanau so not want to see the waters nutrient enriched.
- Investigate the effect of the Taranaki Floodgate on this stream.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Consents in this catchment should not be processed non-notified.

² ** means the site was unrated

3.3 Rakahuri Estuary

TE MOEMOEA

Ensure the Solutions package includes provisions that:

- Protect salt-tolerant species that are typical of the Canterbury coast e.g flax, jointed Wire Rush, Saltmarsh Ribbonwood, and turfland communities.
- Protect the fishery which is considered to be highly productive.
- Enable connectivity of estuary to tributaries and mainstem river for species to move to and from the river system for critical life stages
- Ensure flow management in tributaries is appropriate at crucial times for the ingress and egress of tuna.
- Support recreation in the Rakahuri, including swimming
- Protect whitebaiting which occurs in the tidal reaches of the main river and Saltwater Creek.
- Protect the estuary, which is a highly productive wetland, from toxic chemicals and heavy metals
- Protect the fringe of grass and saltmarsh vegetation that is important for spawning of Galaxiid fish species which form the basis of the commercial and recreational whitebait fishery.
- Implement programmes in agreement with Manawhenua to restock customary fish species
Implement with Manawhenua opportunities associated with reserves.
- Prohibit any further drainage of wetlands.
- Support Te Kohaka o Tuhaitara Trust and the restoration of Tūtaepatu Lagoon as a matter of priority, with emphasis on: (a) weed control; (b) fencing; (c) planting of native species;
- Restore the flow and character of Taerutu stream and lagoon as a wetland of historical and cultural significance.
- Prohibit stock access to waterways; and
- Plant riparian margins along all waterways;

CHALLENGES FROM THE PERSPECTIVE OF TE NGAI TUAHURIRI RUNANGA

- Loss of connectivity at the wrong time could impact migration and recruitment of migrating species especially eels
- Mahinga kai habitats have been lost leading to reduced numbers of mahinga kai species
- The withdrawal of water (from both groundwater and surface water) for irrigation purposes may exacerbate low flows in the river.
- Large floods are needed periodically to re-work gravel surfaces. The extraction of gravel and maintenance of flood protection works cause unnatural disturbance.
- Domestic livestock have damaged part of the upper estuary margins,
- Reclamation is a potential threat to this important habitat.
- Flood protection works draining wetlands, affecting water levels, flooding and the shape of the river and estuary – it has also damaged shellfish and habitats for aquatic and bird life.
- Development around the river estuary has led to loss of habitats, reduced buffers between the land and water, and an increase in nutrients and contaminants entering the water. It has also lead to loss of cultural landscapes and significant cultural sites, impacting on the ability of tangata whenua to utilise reserves and easements.
- Silt washing into the River and silt and sand incursion into the estuary can change the way water circulates, it traps pollutants and affects shellfish beds. This needs to be investigated.
- Stock grazing can affect salt marsh and river/stream edges, nesting grounds for birds and spawning habitats for fish.
- Nutrients and contaminants washing into the stream, rivers and estuary from farms and septic tanks can lead to poor water quality - affecting fish, shellfish, vegetation and river and estuary life. Whanau see algal blooms as evidence of inappropriate inputs to the system.
- A reduced flow of water to the estuary from the river remains a fundamental concern.

WORKING DRAFT

O. Saltwater Creek (Main Road)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • Easy access is available from the road • This creek is a significant tributary to the estuary • The planting programme is extended. • Wetlands are restored, and the salt marsh protected. • This site is respected. Interpretation explains the significance of this stream to the downstream estuary and also why this stream is so significant for Ngai Tuahuriri. • The range of taonga species present increases as populations recover and benefit from the restoration programmes. 	<p>TAONGA SPECIES</p> <ul style="list-style-type: none"> • Black flounder • Common smelt • Yellow eye smelt • Inanga • Common bully • Long fin eel • Short fin eel • Freshwater shrimp • Blue gill bully • Red fin bully • Giant bully • Royal spoonbills • Shags • Godwits • Banded dotterels • Black and pied stilts • Terns • Herons • Wrybills • Gulls
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • It is a tributary that feeds a wetland of immense cultural significance. • It supports a range of taonga species. • It is important for whitebait. 	<p>THREATS</p> <ul style="list-style-type: none"> • Weeds are present • Green slime was observed. • No water movement was apparent. • Diggers have been observed working in close proximity to the estuary. Incremental reclamation of wetlands and estuarine environments by adjacent landuses is a concern. Given its distance from roads, it is difficult to monitor. • Whanau are concerned that farmers are trying to irrigate salt flats. An irrigator is visible on a sand hill. • Riparian planting is negligible and could contribute to the extensive erosion. • Flows are too low. • The discharge from the pig farm impacts this site. • Odours are present that detract from use. • This is a heavily used site. • Leaking pipes and illegal discharges are a concern.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.0	1.26

- It is a modified watercourse that carries natural waters.
- It receives a below average mahinga kai score and a poor health score.
- The degraded state of the stream makes it unattractive to gatherers and it is potentially unsafe for them to gather.
- All health indicators scored poorly.

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<p>Water quality is decreasing</p> <ul style="list-style-type: none"> Failed to meet target for total fine sediment cover every year of monitoring Failed to meet the average for total fine sediment cover 2012 -2015 Target for maximum temperature failed once. Target for dissolved oxygen saturation met. TSS is not an issue at this site. 	<p>Met the LWRP target for cyanobacteria.</p>
MCI & MACROPHYTES	
<ul style="list-style-type: none"> Every year failed to meet the LWRP target for QMCI. Failed to meet target in LWRP for total macrophyte cover Met target for emergent macrophytes 	

RECOMMENDATIONS

NUTRIENT RECOMMENDATION	WATER QUALITY BANDS				
<p>Going forward -</p> <ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	A	B	A	B
	WHANAU PREFERENCE	A	A	A	A
FLOW					
<p>A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the estuary. Whanau preference is for the stream to protect needs of</p> <ul style="list-style-type: none"> Inanga including inanga spawning sites Eels. <p>The flow needs to be sufficient to sustain the full range of native fish species.</p>					

Management Priorities

- Prioritise managing this site as a mahinga kai.
- Enhance water quality
- Minimise sediment inputs and impacts from the eroding bank. Erosion mitigation strategies need to be agreed with Ngai Tuahuriri.
- Investigate the extent of recent reclamations around the estuary. Identify the depth of the buffer between the creek and adjacent landuses, and between the estuary and adjacent landuses.
- Extend the current planting programme.
- Monitor water quality, which will include ongoing cultural monitoring. This is to ensure that water is not nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol
- Remove the remnants of the jetty
- Provide rubbish bins and toilets to eliminate the risk of informal dumping of waste.

- Remove the remnants of the jetty
- Develop a protocol (jointly with Te Ngai Tuahuriri Runanga) for the use of machinery such as diggers in close proximity to the estuary.
- Investigate the flow needs of fish in the stream and estuary



Looking downstream - A range of initiatives are needed to restore this site. It remains an important tributary that once sustained cultural use.

“The wetlands are being converted farmland...there are illegal discharges. We rang the hotline but we got no reaction”

P. Boyne Creek (Brood Road)

TE MOEMOEA <ul style="list-style-type: none"> • Harakeke is potentially a good resource for whanau that is accessible to whanau • Native planting is needed • Point source discharges are removed • Whanau are able to enjoy the site without experiencing the adverse effects associated with the pig farm e.g. odours. • Water quality is to be improved. 	
VALUED FEATURES <ul style="list-style-type: none"> • It is a tributary that feeds a wetland of immense cultural significance. • It supports a range of taonga species. 	THREATS <ul style="list-style-type: none"> • There appear to be discharges at the bridge. • The site is inaccessible so the harakeke and raupo cannot be assessed by whanau. • The site is impacted by the adjacent pig farm. • The site smells. • Lime is applied to paddocks adjacent to the stream • Bank erosion is evident, as is erosion around the bridge. • Limited movement of water – there is a blockage below the bridge. • Water quality is declining • The presence of whitebait stands is an equity issue that should be discussed with Ngai Tuahuriri and a solution found.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.50	1.55

- It is a modified watercourse that carries natural waters.
- It receives an average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of exotics, sediment.

MANAGEMENT PRIORITIES

- Weed control is needed.
- Investigate connections to other estuary.
- Minimise sediment inputs and impacts from adjacent landuse through retention of a sizeable buffer that is planted with indigenous shrubs and trees.
- Land intensification in the lower catchment needs to be controlled.

“The water quality isn’t wonderful I’d hate to fall in”



Looking upstream

- There is Harakeke and Raupo planted. But a greater buffer between the stream and adjacent landuse is needed. It should be planted appropriately.



Looking downstream

- A planted greater buffer between the stream and adjacent landuse is needed. It should be planted appropriately.

WORKING DRAFT

3.5 Waimakariri lowland streams

Q. Cam River (Bramley)

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> • River is restored and managed as a significant cultural landscape. • The river sustains healthy populations of eels, koura, kakahi and patiki. • Access is available for whanau to access the river. • Water quality is restored. • The flow in the river is increased. • Quality of water in the waterways leading to the Cam is restored. • 	<p>TAONGA SPECIES</p> <ul style="list-style-type: none"> Mullet Long fin eel Short fin eel Flounder Common bully Koura (historically) Kakahi (historically) Shrimp (historically)
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> • The river is part of a significant cultural landscape. 	<p>THREATS</p> <ul style="list-style-type: none"> • Whanau stopped using the river when the Rangiora sewage discharged to the river. However its still received stormwater from Rangiora. The residual contamination risk is unknown. • The floodgate at the junction with the Kaiapoi needs to be examined and possibly retrofitted. • Whanau believe the minimum flow is set too low.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.08	2.23

- The plants are all exotic. Willows lines the banks of the river.
- The quality of water in the waterways leading to the river is not good.
- It receives a below average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.
- *I wouldn't swim or gather kai here*

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<p>Water quality is decreasing</p> <ul style="list-style-type: none"> • Failed to meet target for total fine sediment cover 2013-2015. • Failed to meet average for total fine sediment cover. • Target for maximum temperature met. • Target for dissolved oxygen saturation met. • TSS is not an issue at this site. 	<ul style="list-style-type: none"> • Met the LWRP target for cyanobacteria. There is not a health risk from cyanobacteria. • For e-coli the MFE/MOH action level of 550 was breached.

MCI & MACROPHYTES

- Failed to meet the LWRP target for QMCI in 2011 - 2014.
- Failed to meet the LWRP target for average QMCI
- Failed to meet target in LWRP for total macrophyte cover once
- Met target for emergent macrophytes

RECOMMENDATIONS

NUTRIENT RECOMMENDATION	WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> • Targets in the LWRP are not to be lessened (weakened) provide they are sufficient to sustain koura, kakahi and shrimp. • There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95th percentile
	CURRENT	B	A	C	**
	WHANAU PREFERENCE	A	A	A	A
FLOW					
A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai. It is recommended the minimum flow to be at least 1.2 cumec. The flow needs to be sufficient to sustain the full range of native fish species. If the minimum flow is breached there is to be a step-up to 1.4 cumec before takes can resume.					

MANAGEMENT PRIORITIES

- Protect water quality.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau want to reconnect with this site and their safety has to be paramount.
- Maintain good flows in the stream.
- Riparian planting is needed, especially natives that attract birdlife.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Investigate the impact of culverts and floodgates on fish populations.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Whanau so not want to see the waters nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol.



The Cam River - looking upstream at Bramley Road

R. Cust River

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> The river sustains healthy populations of taonga species Access is available for whanau to access the river. Water quality is restored. The flow in the river is increased. Quality of water in the waterways leading to the Cam is restored. 	<p>TAONGA SPECIES</p> <p>Mullet Flounder Long fin eels Short fin eels Upland bully Common bully Inanga Common smelt Common bully Shrimp Giant bully Kakahi koura</p>
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> It is a waterway and need to managed as such ki uta ki tai The needs of taonga species are to be prioritized. 	<p>THREATS</p> <ul style="list-style-type: none"> There is limited access to the river. People see it as a drain rather than a waterway. Flows have been augmented from the Waimakariri Irrigation since 1999 which gives false impression of flows in the river and the level of take that can be sustained.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	1.72	2.74

- It receives a below average cultural use score and an average health score. It is hard to “use” the site when there is no access.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<ul style="list-style-type: none"> Nitrate N in the groundwater around Cust is the highest in the zone. Met the target for total fine sediment cover 3 out of five years Failed to meet the target for the average for total fine sediment cover Target for maximum temperature met target. Target for dissolved oxygen saturation met. TSS is not an issue at this site. Median DIN and DRP far exceed thresholds for protection of biodiversity. DIN exceeds 90% probability of nuisance growths 	<p>MFE/MOH “alert guideline” for cyanobacteria breached 2014 and 2015.</p> <p>Average for cyanobacteria meets target.</p>

MCI & MACROPHYTES

- Failed to meet the LWRP target for QMCI 2011-2015
- Failed to meet the LWRP target for mean QMCI
- Met target in LWRP for total macrophyte cover
- Met target for emergent macrophyte cover

RECOMMENDATIONS

FLOW

A flow regime is to be set for this stream. It should be protected as a spring fed stream that could be a mahinga kai. Whanau preference is at least 400l/s provided this is sufficient to sustain the full range of native fish species.

NUTRIENT RECOMMENDATION

WATER QUALITY BANDS

Going forward -

- Targets in the LWRP are not to be lessened (weakened) provided this is sufficient to protect kakahi, koura and shrimp.
- There is to be 100% compliance with the thresholds in the LWRP.

	Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
CURRENT	C	B	B	**
WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Improve water quality. Address high nutrient levels.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau do use this site and their safety has to be paramount.
- Maintain good flows in the stream.
- Improve access to the stream by whanau.
- Riparian planting is needed. Remove willows and replant.
- Increase the minimum flow. Include a “step up” if the minimum is breached.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Investigate to see if the kai in the stream is safe to eat.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Whanau so not want to see the waters nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol



The Cust - looking downstream

S. Southbrook

TE MOEMOEA <ul style="list-style-type: none"> This waterway is restored the length of its catchment. It provides reliable quantities of high quality water to the Cam. 	TAONGA SPECIES
VALUED FEATURES <ul style="list-style-type: none"> It should be a reliable source of water to the Cam. 	THREATS <ul style="list-style-type: none"> The water appears clear but it runs through an industrial and residential area. It is still a straightened watercourse. It would be good to have a more natural appearance. Mitre 10 has a sawmill

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.61	3.4

- It is a modified watercourse that carries natural waters.
- It receives an above average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<p>Water quality is decreasing</p> <ul style="list-style-type: none"> Failed to meet target for total fine sediment cover 2 of the last five years Failed to meet the average for total fine sediment cover Target for maximum temperature met Target for dissolved oxygen saturation met. TSS is not an issue at this site. DIN – high – exceeds the 90% probability of nuisance macrophyte growth 	<p>Met the LWRP target for cyanobacteria. Perceived to be no health risk.</p> <p>Ecoli – the MFE/MOH “action trigger” of 550 has been breached.</p>
MCI & MACROPHYTES	
<ul style="list-style-type: none"> Failed to meet the LWRP target for QMCI 2011- 2015. Failed to meet the LWRP target for mean QMCI Failed to meet target in LWRP for total macrophyte cover twice since 2011 Met the mean target LWRP for total macrophyte cover Met target for emergent macrophytes 	

RECOMMENDATIONS

FLOW						
A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the Cam. Whanau prefer the flow to be at least 170l/s. The flow needs to be sufficient to sustain the full range of native fish species.						
NUTRIENT RECOMMENDATION		WATER QUALITY BANDS				
Going forward - <ul style="list-style-type: none"> • Targets in the LWRP are not to be lessened (weakened). • There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile	
		CURRENT	B	B	B	**
		WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

- Protect water quality.
- Investigate the quality of the water to ensure that it is safe for gathering.
- Set a minimum flow for this stream.
- Riparian planting is needed.
- Identify if there are any legacy contamination issues from runoff from the township.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Work with whanau to identify and protect the springheads.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol



Looking downstream – the replanted reach of the SouthBrook

T. Silverstream (at Swing Bridge)

TE MOEMOEA <ul style="list-style-type: none"> The stream is restored to a state where it provides good quantities of high quality water It sustains abundant populations of native fish species The springs that feed this stream are protected. 	
VALUED FEATURES <ul style="list-style-type: none"> It is a spring fed stream and the replanting is attractive. 	THREATS <ul style="list-style-type: none"> 4WD Impacts of salmon farm upstream Surrounding landuses.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.3	3.0

- It is a modified watercourse that carries natural waters that appear to be high quality but there is no sign off life.
- It receives a below average cultural use and an average health score.
- All health indicators scored average including water quality, riparian cover, presence of weeds etc.
- Driving of cars in the stream need to be stopped.

RECOMMENDATIONS

FLOW RECOMMENDATIONS						
<p>A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the Cam. Whanau want to see a flow of at least 600l/s.</p> <p>The flow needs to be sufficient to sustain the full range of native fish species.</p>						
NUTRIENT RECOMMENDATION		WATER QUALITY BANDS				
<p>Nitrates are increasing since 2006.</p> <p>Going forward -</p> <ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 						
		WHANAU PREFERENCE	A	A	A	
			Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile

MANAGEMENT PRIORITIES

- Protect water quality.
- Investigate the quality of the water to ensure that it is safe for gathering. Whanau do use this site and their safety has to be paramount.
- Maintain good flows in the stream.
- Riparian planting is needed.
- Monitor water quality, which will include ongoing cultural monitoring. This stream is fed by a natural spring. Whanau so not want to see the waters nutrient enriched.
- Continue to implement with Te Ngai Tuahuriri Runanga the agreed drain cleaning protocol



Looking upstream at the Silverstream – the ford where 4WD are washed.



Looking downstream at the Silverstream – the site where whanau have not seen fish life.

U. Kaiapoi

<p>TE MOEMOEA</p> <ul style="list-style-type: none"> Returned to its former glory as a significant of mahinga kai The lower reaches are restored as a whitebait fishery. The inflows from the Cam are of high quality. The quality of water supports a range of cultural uses including swimming and waka ama. 	<p>TAONGA SPECIES</p> <table> <tr> <td>Flounder</td> <td>Open water divers</td> </tr> <tr> <td>Common smelt</td> <td>Waterfowl</td> </tr> <tr> <td>Long fin eel</td> <td>Gulls</td> </tr> <tr> <td>Short fin eel</td> <td>Terns</td> </tr> <tr> <td>Giant bully</td> <td>Scaup</td> </tr> <tr> <td>Inanga</td> <td></td> </tr> <tr> <td>Kanakana</td> <td></td> </tr> </table>	Flounder	Open water divers	Common smelt	Waterfowl	Long fin eel	Gulls	Short fin eel	Terns	Giant bully	Scaup	Inanga		Kanakana	
Flounder	Open water divers														
Common smelt	Waterfowl														
Long fin eel	Gulls														
Short fin eel	Terns														
Giant bully	Scaup														
Inanga															
Kanakana															
<p>VALUED FEATURES</p> <ul style="list-style-type: none"> It is a historic mahinga kai. 	<p>THREATS</p> <ul style="list-style-type: none"> Sewage s in the system Water quality prevents use. Whanau are scared Fish populations are declining. The effects of poor water quality The trees are dying because of salt water intrusion (post-earthquake). 														

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	2.2	1.57

- Whanau have got sick from being in the water
- There is too much sediment on the bottom
- There was debris throughout the river including machinery and plastics on the riverbed.
- It receives an average mahinga kai score (that is distorted because of the high score for access to the river. The site got a below average health score. Most of the health indicators scored poorly.
- Limited taonga species are present – the “odd patch of harakeke”.

OTHER ASSESSMENTS

WATER QUALITY	RECREATION
<ul style="list-style-type: none"> Failed to meet target for total fine sediment cover last four years Failed to meet the average for total fine sediment cover Exceeds the 90% probability of nuisance macrophyte growth Target for maximum temperature met. Target for dissolved oxygen saturation met. TSS is not an issue at this site. DIN concentrations are high. 	<p>E-coli levels high. The 550 “action level” is breached regularly.</p> <p>2010 – 2016 was classed as very poor</p> <p>Met the LWRP target for cyanobacteria. It is not a health risk</p>

MCI & MACROHPHYTES	FLOW RECOMMENDATIONS
<ul style="list-style-type: none"> Invertebrates are degraded. Failed to meet the LWRP target for QMCI for 2012 - 2015. Failed to meet target in LWRP for total macrophyte cover. Met target in LWRP for emergent macrophytes. 	<p>A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai.</p> <p>Whanau preference is for flows at least:</p> <ul style="list-style-type: none"> @ Neeves Road at least 1.200 cumecs <p>The flow needs to be sufficient to sustain the full range of native fish species.</p>

RECOMMENDATIONS

FLOW RECOMMENDATIONS					
<p>A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai. Whanau preference is for flows @ Neeves Road at least 1.200 cumecs. The flow needs to be sufficient to sustain the full range of native fish species.</p>					
NUTRIENT RECOMMENDATION	WATER QUALITY BANDS				
<p>Going forward -</p> <ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95 th percentile
	CURRENT	C	B	B	**
	WHANAU PREFERENCE	A	A	B	B

MANAGEMENT PRIORITIES

- Improve water quality.
- Remove trees that have died and replant with salt tolerant native plants.
- Maintain health flows in the stream consistent with whanau provisions.
- Minimise impacts from adjacent landuse by establishing a larger buffer zone that is planted and fenced off. Stock are to be excluded.
- Monitor water quality, which will include ongoing cultural monitoring.



The Floodgate where the Cam meets the Kaiapoi is an issue for whanau.

V. Courtenay River

TE MOEMOEA	
<ul style="list-style-type: none"> Recognise and manage this stream as part of a significant cultural landscape that includes Kakanui Pa 	
VALUED FEATURES	THREATS
<ul style="list-style-type: none"> It is a significant cultural landscape that includes Kakanui Pa 	<ul style="list-style-type: none"> The site is overgrown by willows.

CULTURAL ASSESSMENT

Site Status	Mahinga kai measure	Health measure
A-0	1.37	1.48

- The site has a putrid smell*
- It had very little flow on the day of the assessment.
- The site was overgrown with willows.
- There is a floodgate downstream that needs to be investigated with a view to retrofitting.
- There is a silage pit adjacent to the stream.
- There is a sign warning of the sewer line.
- It receives an above average mahinga kai score and a below average health score.
- A range of health indicators scored below average including water quality, riparian cover, presence of weeds etc.

RECOMMENDATIONS

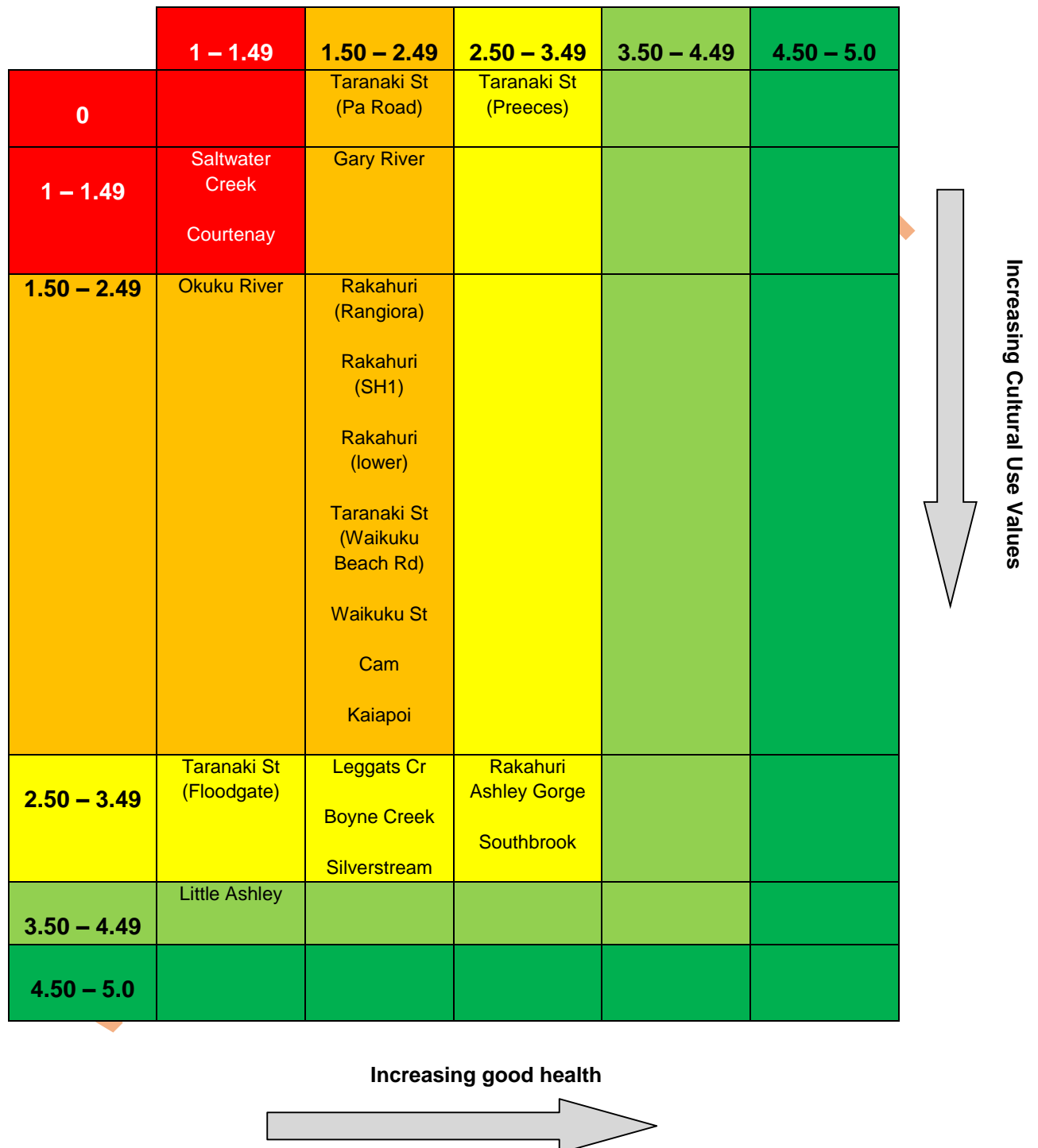
FLOW RECOMMENDATIONS					
<p>A flow regime is to be set for this stream. It should be protected as a spring fed stream that is a mahinga kai, and because it provides flows to the Cam. Whanau want to see a flow of at least 400l/s at the Ashley Meat Factory. The flow needs to be sufficient to sustain the full range of native fish species.</p>					
NUTRIENT RECOMMENDATION		WATER QUALITY BANDS			
Going forward - <ul style="list-style-type: none"> Targets in the LWRP are not to be lessened (weakened). There is to be 100% compliance with the thresholds in the LWRP. 		Nitrate toxicity	Ammonia toxicity	E-coli median	E-coli 95th percentile
	WHANAU PREFERENCE	A	A	A	A

MANAGEMENT PRIORITIES

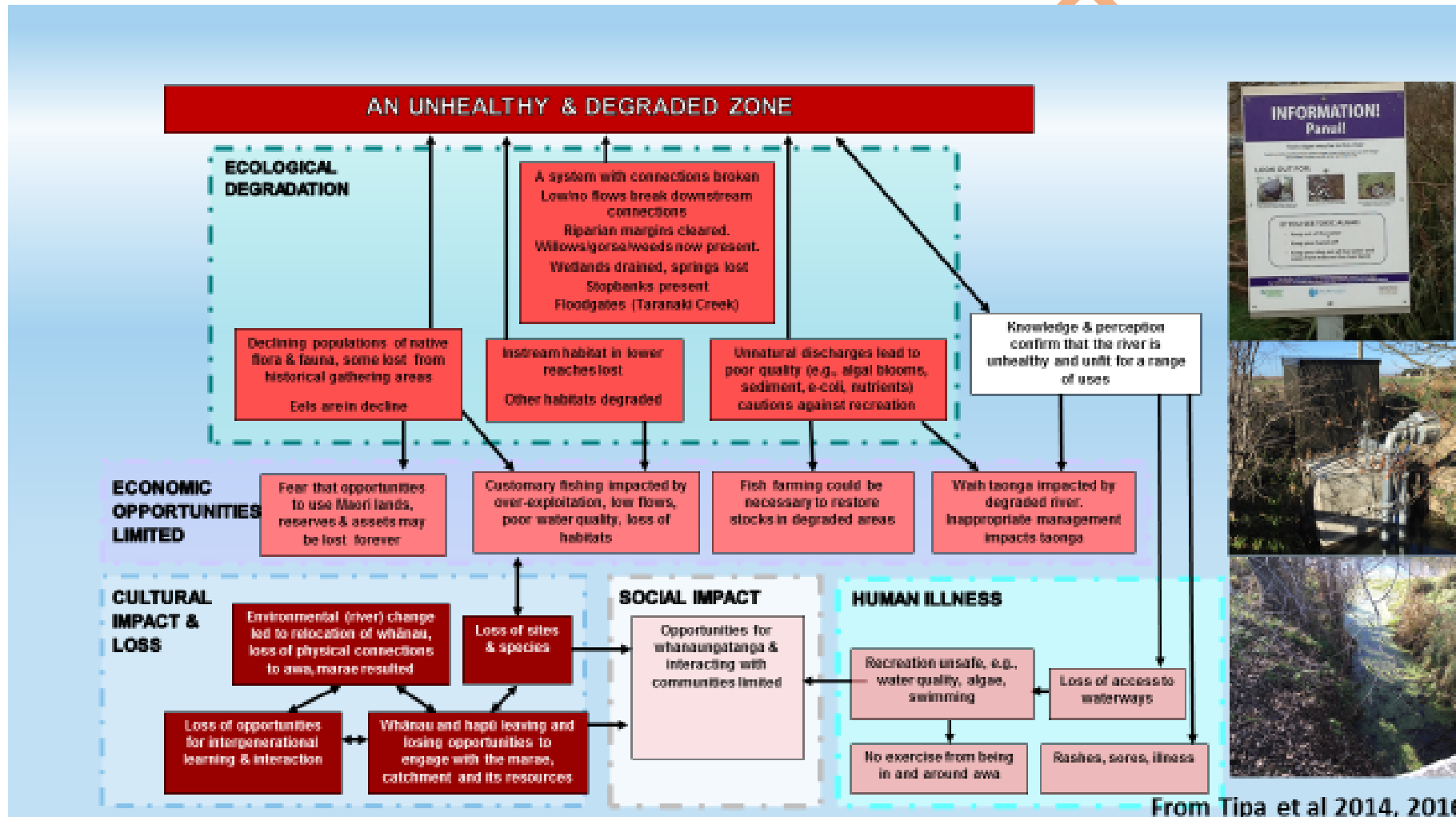
- It requires some serious TLC*
- Improve water quality.
- Remove willows
- Develop a management plan for the cultural landscape.
- Investigate the impact of the floodgate.
- Restore flows to the site.

3.6 Summary

In Figure 4 below, we have tried to show how the scores for the respective sites assessed relate to each other.



Given the results of the cultural assessments undertaken and the data contained in the ECan technical reports, whanau can identify how the degraded parts of the catchment impact their health and wellbeing.



WORKING DRAFT

CHAPTER 4: RECOMMENDATIONS

The catchments of the Waimakariri zone restored as mahinga kai – this requires:

1. Water flows in rivers are increased, especially lowland streams. A visible connected flow – ki uta ki tai - is reinstated for the Rakahuri (see recommendations for flows at Ashley Gorge and SH1)
2. Flow variability (especially higher flushing flows seasonally) to trigger and restore passage for migratory native fish species
3. Allocation of water for cultural purposes is to be put in place for all streams where an allocation regime exists. In the first instance an allocation is to be made for the Rakahuri and the Cam.
4. Unless there is “new water” and until there are allocations for cultural purposes, there is to be no further allocation of water for irrigation from waterways in the zone
5. Water quality protected where it is currently high, and where degraded improved to drinkable quality, especially the Taranaki Creek, Cam, Kaiapoi and Rakahuri (see the band recommendations for these streams).
6. Increased native fish populations is a priority, especially mahinga kai species. See recommendations for some streams that specific species are to be provided for.
7. Needs of indigenous fish species are prioritised over exotic fish species.
8. Improve water quality so whanau are able to gather resources, play and enjoy themselves in the Rakahuri, the Cam and in the estuaries of North Canterbury
9. Instream habitats restored with provision made in the sub regional plan for the installation of artificial habitats in the short term
10. No algal blooms in the lower reaches of any streams.
11. Drains are to be recognised as substitute habitats and managed as waterways.
12. Streams fenced off and stock excluded – a priority for springheads and the lowlands.
13. Water security (quantity and quality) for the marae and papakainga at Tuahiwi
14. Taranaki Creek is to be the site of a whole of catchment enhancement programme; the Cam is to be restored; and the Rakahuri Gorge protected from damming. Rakahuri and Cam flow regimes are to be revisited (higher with seasonal variations).
15. Water quality in the lagoons of Saltwater/ Rakahuri/ Kaiapoi is improved.
16. Levels in the springs in the lower reaches are identified and protected & don't run dry (e.g. Little Ashley)
17. Floodgates at Taranaki Creek, Courtenay & Cam are retrofitted to restore the indigenous fishery
18. Use of reserves and easements enabled by improved access, restoration, improved flows, good water quality, increased abundance of species, and allocations of water for cultural purposes.

19. All spring heads are mapped, protected with a buffer around them, and statutory protective provisions put in place.
20. Species gathered by whanau are free of heavy metal contamination and safe to eat.
21. ECan engineers change their practices to include protection of instream functioning
22. Discuss with whanau opportunities to restore Harris's Creek; and Smarts Road Creek
23. The following minimum flows are recommended.

River	Whanau flow preference for flow	Comparisons
Northbrook	590l/s	Higher minimum flow than current minimum flow in WRRP
Middlebrook	50l/s	Current minimum flow in WRRP
Greigs Drain	230 l/s	Current minimum flow in WRRP, higher than new figure recommended.
No. 7 drain	60 l/s	This is the current minimum flow, and is what is recommended
Ohoka	420 l/s	Higher than the current WRRP, and higher than minimum flow that is recommended.
Ashley River Gorge	Visible connected flow – ki uta ki tai - with variability	Significantly higher minimum flow than current minimum flow in WRRP
Ashley River SH1	Visible connected flow – ki uta ki tai - with variability	Significantly higher minimum flow than current minimum flow in WRRP. The suggestion of a step up is a new concept.
Saltwater Creek		
Cam River	1.2 cumec	This is higher than the current figure that is in the WRRP. The concept of a step-up is new.
Taranaki Creek (Preeces)	At least 120l/s	
Silverstream	600l/s	
Southbrook	170l/s	
Okuku River	650l/s	Higher than current minimum that is attached to consents.
Garry River	100l/s at Birch Hill	
Leggats Creek	At least 90% of 7dMALF	
Little Ashley	50l/s	Current, minus the compromise to 30l/s for a set number of days per month
Kaiapoi Stream	1.2 cumecs	Higher than recommended.
Waikuku Stream	600l/s	
Cust	400l/s	
Courtenay	400l/s	

24. If the runanga does agree to “new water” in the zone, the runanga reserves the right to ask for all minimum flows to be increased.

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