

5. Cultural Values

The following section provides an overview of cultural values associated with the Waikirikiri/Selwyn-Te Waihora catchments largely drawn from the Te Waihora Joint Management Plan (Te Runanga o Ngāi Tahu and Department of Conservation, 2005) and a draft report on cultural values, flow and water management issues prepared for the Environment Canterbury Selwyn Waihora zone committee (Tipa and Associates, 2013 *in press*).

5.1. Overview

The following is a brief summary of the cultural, natural, historic, recreational and commercial values of Te Waihora and the Te Waihora environment as set out in the Joint Management Plan.

Te kete ika

The management and sustainable use of quality traditional food and other cultural resources of Te Waihora maintains and enhances the rangatiratanga and kaitiaki role of Ngāi Tahu in recognition of this tribal taonga.

Landforms and landscapes (Te matawhenua)

The flat, spread out nature of Te Waihora is a prominent feature of the Canterbury Plains/Ngā Pākihi Whakatekateka o Waitaha. The waters of Te Waihora have sustained generations of Ngāi Tahu and the resultant cultural landscape continues to bind Ngāi Tahu to the area. Te Waihora, which is a large brackish coastal lake, is a distinctive landform type in New Zealand but one that is rare internationally. So is Kaitorete Spit, the shingle barrier that separates Te Waihora from the sea.

Wildlife habitat and biodiversity (Ngā toi whenua me ngā tūmomo koiora)

Te Waihora is a storehouse for wetland biodiversity. It comprises a habitat possibly unrivalled in New Zealand for a recorded 166 different species of birds including waterfowl, wading and migratory types. It also provides habitats for a wide diversity of plant and invertebrate species. Many species are mahinga kai species that have sustained Ngāi Tahu customary use of the area.

Historic Resources Taonga puri mahara

Historic Māori occupation around Te Waihora and subsequent Māori and European settlement and their associated use of natural resources positioned Te Waihora as an integral part of Canterbury's heritage.

Recreational use and public access Mahi-ā-tākaro hoki me te whai wāhi o te hāpori

Te Waihora provides a high quality recreational area for many user groups including fishers, game bird hunters, water based recreationalists, bird watchers and those enjoying the wide-open spaces. This includes recreational fishing and game bird hunting, some of which involves customary use, as well as water sports, recreational hut settlements and other public use of land.

Commercial and other activities

Ngā mahi arumoni me ētahi atu mahi

Commercial uses occur within Te Waihora, such as fishing and stock grazing along with other, generally public activities and other agency activity. The lake community values these commercial activities which are based on the natural and ecological values of Te Waihora. These include commercial fishing of freshwater eels, mullet and flounder, grazing, accommodation, eco-tourism activities, utilities and research.

5.2. Wahi Tapu/Taonga

For Ngai Tahu, the term wāhi taonga refers to places that hold the respect of the people in accordance with kawa and tikanga. Some sites are of tribal significance while others are important to the hapu and whanau who visited, lived at, or had special affiliations to that area. Prominent hills, landforms, springs, remaining areas of indigenous vegetation and archaeological sites are examples of physical taonga. Recorded Maori archaeological sites around Te Waihora include pā sites (fortified settlements), kainga (undefended settlements), urupa (burial grounds and single burial sites), borrow pits (small quarries from which sand or gravel was removed and added to gardens to improve the soil for kumara growing), shell middens, cooking ovens, storage pits and isolated artefact find spots.

Water is a taonga left by the ancestors to provide and sustain life. The ability to gather and share food which is a cornerstone of Ngai Tahu society, tradition and mana is reliant on healthy ecosystems and especially water that is fit for human consumption and that is able to support mahinga kai species. Significant cultural sites include: Te Waihora/Lake Ellesmere, Muriwai/Coopers Lagoon, Waikirikiri, the Kaituna River, the Rakaia and Waimakariri braided rivers and their upper catchment wetlands and lakes, and the Rakaia river mouth. More generally, all spring-fed streams, lowland streams and wetlands are of cultural significance, as are areas of mahinga kai and any remaining indigenous biodiversity.

Other taonga can include pūrākau (stories), wāhi ingoa (place names) or other associations that those living today have with the tupuna (ancestors) who have gone before. Since 1999 Ngai Tahu has identified a range of wahi tapu / wahi taonga. Those found in Waikirikiri - Te Waihora catchments include:

- Ara tawhito (ancient trails)
- Kaika Nohoanga (occupation, settlement sites)
- Mahinga Kai (places where resources including food were/are procured)
- Mauka (important Mountains)
- Pa Tawhito (ancient pā sites)

- Umu ti (earth ovens associated with preparation of kauru)
- Ikoa Tawhito (place names)
- Wāhi kaitiaki (resource indicators from the environment)
- Wahi kohatu (rock formations)
- Wahi paripari (cliff areas)
- Tauranga Waka (canoe mooring sites)
- Wahi raranga (sources of weaving material)
- Tuahu (sites of importance to identity)
- Tuhituhi nehera (rock art)
- Urupa (human burial sites)
- Wahi tohu (locators and their names within the landscape)
- Repo Raupo (wetlands and swamps) and Wai Maori (important freshwater areas)
- Wai tapu (sacred waters)
- Marae
- Reserves, easements, entitlements, private lands
- Wahi pakanga

Place Names

Place names and histories provide cultural context. The naming of places by Ngai Tahu is testament to the long history of occupation and travel within the catchment. Important places include camping places enabling food gathering, those associated with creation traditions or tupuna, settlements, and sites renowned for the different foods that could be obtained. Places and their names formed vast oral 'maps' that were an integral part of the culture of Ngai Tahu. Many of the place names describe the characteristics of the waterbodies or the adjacent riparian and terrestrial environs.

A majority of physical features within the Waikirikiri/Selwyn-Te Waihora catchment have names attached by Ngai Tahu. Tipa and Associated (2013, in press) provides a listing of place names specific to Te Waihora.

Wai tapu

Specific freshwater sources are valued because of their status or usage. Values (both tangible and intangible) associated with specific freshwater resources include: the role of particular freshwater resources in creation stories; the role of those freshwater resources in historical accounts; the proximity of settlements and/or historical sites in or adjacent to specific freshwater resources; the value of freshwater resources as a source of tribal identity; mahinga kai; the use of freshwater resources as access routes or transport courses; and the continued capacity for future generations to

access, use and treasure the resource (Ministry for Environment, 1998). Waters can be classed as Wai Tapu (sacred waters) or Wai Taonga (treasured waters).

Maunga

Maunga (Mountains) play an important role in spiritual and cultural beliefs of Ngai firstly as gateways to the atua (gods), and secondly as the gatherers of the tears of Rakinui (Sky Father), which in turn nourish Papatuanuku (Earth Mother). The maunga of the Waikirikiri hold a mixture of tupuna names, appearance names and use names. They generally act as reference points that guide people to a particular food gathering site. As they approach the maunga, they then refer to other icons such as waterways, trees or rocks to guide them.

Maunga of the Waikirikiri:

- Motukiore – Woolshed Hill
- Tarauri – Mount Misery
- Ruahine – Cairn Hill
- Pukeāhua – Abners Head
- Pukemārama – Racecourse Hill
- Kākāpōtahi – Malvern Hills

Urupa

Urupa are burial sites. Generally larger urupa are associated with the more permanent living settlements in the area. Known Urupa in the Waikirikiri Catchment include:

- Whakaepa Pa – Coalgate
- Ohinekakaraiti – Junction of Kōwai & Waimakariri Rivers

It is likely that there urupa associated with the following sites:

- Te Mimi o Taua
- Taramata
- Pakarā
- Pukeāhua
- Te Kauaka
- Otuteihoka
- Puaka
- Tamanui
- Tokorewa

Tuahu

Tūāhu, or sacred altars, were important sites of significance. Tūāhu played an important role in traditional Ngāi Tahu tikanga (customs) including matakite (foretelling the future), waitohi (blessings/baptisms), karakia (incantations), whakanoa (cleansing), as well as being a medium that connected with ngā atua (the gods). The tūāhu were the tools of the tohunga to aid them in the task they had before them.

Tūāhu could range from being a specially arranged area within a pa or living area, to being a tree or clump of vegetation or a waipuna (spring). Since the embracing of Christianity, Ngāi Tahu have come to rely less on the role of the tūāhu and such the locations of many tūāhu are now unknown. Known Tūāhu of the Waikirikiri Catchment

- Taramata
- Whakaepa
- Ohinekakaraiti
- Pukeāhua

Wahi pakanga

Wāhi pakanga are places where historical battles took place between iwi, hapū or whānau. The sites automatically inherit a wāhi tapu (sacred site) status given the blood that has been shed upon it. Equally, those killed on the battle field were often buried in close proximity to the site and thus wāhi pakanga also have associated urupā. In absence of a known burial site, the wāhi pakanga is treated in the same reverence as if it were an urupā and those killed are in fact buried there. Prior to the attacks of Te Rauparaha in the early 1830's, Ngāi Tahu had been engaged in a large inter whānau feud aptly named Te Kaihuaka (Eat Relations). During this feud the Pa on Ripapa Island, whose chief was Taununu, was attacked by a Kaiapoi taua (war party). In utu (revenge), Taununu and his people travelled without detection to the pa of Whakaepa, near Coalgate and lay siege on the outpost killing all of its occupants. The site of the Whakaepa Pa remains a wāhi pakanga and holds special significance for Ngāi Tahu whānau whose tupuna (ancestors) were killed there.

Ara Tawhito

Ngai Tahu whanui advised that tupuna would have travelled throughout the catchment when harvesting mahinga kai from the river valleys. Further to the fact that this catchment contained large numbers of birds, such as ducks and weka, kiore, and fish, it is noted that this valley was an important stopover for parties journeying through to Whakamātau (Lake Coleridge) and further to Noti Raureka (Brownings Pass) to gather pounamu from the Arahura River. It was also a stopover for parties travelling northwest over Ōtāneuru (Porters Pass) and into the Waimakariri basin.

Mahinga kai

The ability to gather and share food which is a cornerstone of Ngai Tahu society, tradition and mana is reliant on healthy ecosystems and especially water that is fit for human consumption and that is able to support mahinga kai species.

Te Waihora is a tribal taonga; and has been home to a permanent settlement for many generations because it provided abundant mahinga kai all year round. In the foothills, the Waikirikiri flows year-round and was an important mahinga kai resource for hapu at Te Waihora.

Mahinga kai resources of the Waikirikiri/Selwyn-Te Waihora catchments are listed in **Table 12** below.

Tipa and Associates (2013, *in press*) note that water quality and water quantity are essential to sustaining mahinga kai within the Waikirikiri-Te Waihora catchments. The ecological function and health of the catchment become a holistic measure of water management, and provide a pathway toward the restoration and maintenance of mahinga kai.

Wahi raranga

This site is similar to a mahinga kai but differs in that it is specifically valued for the weaving resources that are found there. A wāhi raranga is more often a stand of harakeke (flax) but can also include species such as taramea (spaniard), ti kouka (cabbage tree), neinei (shrub), raupō (bulrush), and toetoe. In many cases wāhi raranga were planted specifically to supply a food preparation or habitation site.

Ngahere

The location and distribution of remaining areas of native vegetation perform an important function as ecological corridors for toanga bird species seeking, for example food sources and nesting sites both within the forest blocks and in adjoining areas of native vegetation.

Table 12. Summary of mahinga kai resources of Te Waihora. (Reproduced from the Te Waihora Joint Management Plan)

Kai whenua (from the land)		Manu (birds)	
Māori name	English name	Māori name	English name
aruhe/tauhinu	fern root*	hua kaki ānau	black swan eggs ^o
harakeke	flax*	hua manu	other bird eggs
kākaho	reeds	kaki ānau	black swan ^o
kiore	rat ^o	karoro	black-backed gull*
kōwhitiwhiti	watercress (introduced)	kereū	wood pigeon**
kūmara	kumara	kōau	black** , pied* , little shag*
mānia	sedge*	kōtuku	white heron**
paru	mud	kuruhengi/ pāteke	New Zealand shoveller*
pīngao	sand sedge*	matuku	Australasian bittern ⁺
pūhā	sour thistle	pākura/pūkeke	pūkeke* ^o
raupō	bullrush/raupo*	pāpango/raipo	New Zealand scaup/ black teal ⁺
rongoā	medicinal plants	pateke/ tarawhatu	brown teal**
tī kouka	cabbage tree*	pārera / māunu	grey duck* ^o
tororaro	wiggy wig	pūtakitaki	paradise shelduck**
wīwī/whiwhi/ wewe	rushes*	ririwaka	bar-tailed godwit ⁺
Ika (fish)		ruru koukou	morepork**
aua	yellow-eyed mullet	tarāpuka	Red-billed gull ⁺
īnanga, mala/ua	whitebait	tete	grey teal*
kanakana/ piharau	lamprey	whiowhio	blue duck ⁺
kōkopu	kōkopu		
mohoao	black/common flounder		
pāraki	smelt		
pātiki	3-corner flounder/ whitebelly		
pātiki totara	yellow-belly flounder		
tuna	eel		
ūpokororo	grayling		
kākahi	freshwater mussels		
waikōura	freshwater crayfish		
tuaki	cockles*		

A number of other marine fish species also intermittently inhabit Te Waihora and are sourced as mahinga kai.

⁺ Protected under the Wildlife Act 1953.

^{*} Customary fisheries 'Shellfish species' under the Ngāi Tahu Claims Settlement Act 1998.

^{*} Taonga Species under the Ngāi Tahu Claims Settlement Act 1998.

^o Game birds under the Wildlife Act 1953

Taonga Species

There are numerous plant, bird and fish species within the Te Waihora catchment which are classed as taonga species in the Ngai Tahu Claims Settlement Act 1998. A detailed listing of these is provided in Appendix 5 of the Te Waihora Joint Management Plan.

Wahi Kohatu

Ngai Tahu whanui advised that there are a number of rock formations of significance in the Waikirikiri-Te Waihora catchments. These include unusual or distinct rock formations which provide spatial reference as well as locations which have been used as camp sites or which contain rock art.

Reserves, easements

There are a number of reserves, easements and entitlements in the Waikirikiri-Te Waihora catchments. Ngai Tahu surrendered title to significant tracts of lands in the nineteenth century. However small tracts of land were identified as reserves for Ngai Tahu. Many of the reserves and fishing easements can be traced back to Crown Grants to Ngai Tahu whanui which stem from the Southern Purchase Deeds negotiated between 1844 and 1857. For lands that were granted to enable the continuation of a food gathering lifestyle, certain guarantees were provided with respect to the nature of natural resources that were to sustain this lifestyle.

Repo raupo

"Repo Raupō" is the general term applied to wetlands. These areas were important sources of mahinga kai or were rich in biodiversity that supported species that were considered important mahinga kai. These areas were also valued for such things as paru (mud for dye).

5.3. Summary

The following is a summary of cultural values associated with the Waikirikiri/Selwyn-Te Waihora catchments (Tipa and Associates, 2013 *in press*):

- Water is precious and needs to be managed as a taonga. Source waters in particular need to be protected from alteration. Spring heads are valued source waters.
- A healthy catchment is not just about water, but many other parts need to be in good order to comprise a healthy catchment. The biodiversity is sustained by the waters. If the biodiversity is healthy, then people are healthy.
- Tangata whenua interact with all of the Waikirikiri-Te Waihora catchments.
- Clean water of sufficient quantities is associated with a sense of wellbeing among whanau. Ensuring plentiful supplies of clean water, especially at the marae, are available is fundamental.
- Valuing and providing for diversity, interconnectedness and the cycle of life is important.
- Mahinga kai lies at the core of Ngai Tahu culture and identity.
- A healthy catchment will enable whanau to use their reserves and their lands.

Central Plains Water Limited
Baseline Water Quality Assessment

- Water is a key feature in many of the cultural landscapes of Waikirikiri-Te Waihora that are highly valued by Tangata whenua.

6. Summary

Development of the CPWL scheme will result in significant changes to existing land use and water abstraction patterns across the mid to upper sections of the Central Plains area. These changes have the potential to alter water quality in receiving waters, particularly in terms of Nitrate-N concentrations. Groundwater is extensively utilised for potable supply across the Central Plains area. Increases in Nitrate-N concentrations have the potential to result in wells exceeding recommended health guidelines for safe drinking water. A significant portion of groundwater flowing through the Central Plains aquifer system is ultimately discharged to lowland rivers and streams in the vicinity of Lake Ellesmere/Te Waihora. Changes in groundwater Nitrate-N concentrations may therefore also impact on ecological and environmental values associated with these waterways and the lake itself.

Analysis of historical groundwater Nitrate-N concentrations recorded on the Environment Canterbury groundwater quality database indicates that:

- Groundwater Nitrate-N concentrations appear to have been elevated in some areas of the Central Plains since at least the 1970s;
- Wells less than 50 metres deep appear to show a relatively consistent increase in median Nitrate-N concentrations from the 1970s to the present day. The largest increases (>4 mg/L) over this period appear to have occurred across the mid-Plains with smaller increases noted in lowland areas;
- Nitrate-N concentrations in many shallow wells (<50 metres) exhibit significant short-term variability in response to land surface recharge flux. Periods of increased recharge due to high rainfall (with an unknown contribution from irrigation) tend to be associated with peaks in Nitrate-N concentrations. In many wells this short-term variability tends to be of a significantly greater magnitude than any underlying long-term trends;
- In deeper wells (>50 metres) the magnitude of changes in Nitrate-N concentrations tend to have been relatively minor prior to 2000 but appear to have accelerated in recent years, particularly across the mid to upper plains.

Analysis of land use scenarios for the CWMS Selwyn Waihora zone limit setting process indicate that even if future land use were to remain unchanged (from 2011), groundwater nitrate concentrations in the Central Plains area will continue to increase by approximately 30% over current levels due to the lag between land use and resulting changes in groundwater quality.

Consent conditions for the CPWL scheme require comparison of measured water quality against a 'baseline' representing its likely state in the absence of the scheme. However, groundwater quality at any point in an aquifer system reflects a complex interaction between a number of factors including land use, recharge flux and the nature of infiltration and flow through the unsaturated and saturated zones respectively so varies spatially, with depth and over time. As a consequence, there is no single measure available to determine 'baseline' groundwater quality. Rather, any quantitative measure of groundwater quality is highly influenced by the location and depth of sample sites utilised.

Combined with inherent short-term variability, these factors will make it difficult to determine effects associated with the CPWL scheme from the baseline. Identification of such effects will require development of a monitoring network that can be utilised to characterise temporal changes in groundwater quality between individual and grouped monitoring sites. This process may be assisted by utilisation of quantitative and qualitative measures of factors contributing to temporal variations in groundwater quality including actual nutrient losses, temporal and spatial variations in land use, recharge flux and groundwater level variations.

Current water quality in Te Waihora/Lake Ellesmere catchments is characterised by elevated levels of dissolved inorganic nitrogen (DIN), dissolved reactive phosphorus (DRP) and indicator bacteria. The elevated nutrient concentrations are also associated with macrophyte and filamentous algae growth at monitoring sites at levels exceeding targets established in the NRRP. These factors exert a significant influence on ecological, cultural and environmental values associated with these waterways.

While DRP and microbial contaminants in lowland streams are largely related to land management practices in individual catchments, the spring-fed nature of these streams mean DIN concentrations are directly related to Nitrate-N concentrations in contributing groundwater. While assessment of water quality data collected over the past two decades indicates declining trends in DRP concentrations due to improved catchment management, a large number of monitoring sites indicate ongoing increases in DIN concentrations reflecting lags within the groundwater system across the wider catchment. Analysis of land use scenarios for the CWMS Selwyn Waihora zone limit setting process indicate that even if land use across the Central Plains were to remain unchanged (from 2011), DIN concentrations in these streams are likely to rise significantly (between 20 to 40 percent over current median concentrations) with a consequent increase in risk to ecological, cultural and environmental values.

Current water quality in Te Waihora/Lake Ellesmere is characterised in terms of high nutrient and suspended sediment concentrations, with consequent high phytoplankton (suspended algae) biomass and low clarity. Monitoring of key water quality parameters indicate water quality in the lake has remained relatively stable over the last 20 years with the over water quality state consistently classified as hypertrophic.

Modelling of potential future land use scenarios for the Selwyn Waihora limit setting process indicates that the overall total nitrogen (TN) loading to the lake is likely to increase by around 30 percent under current land use. This increase reflects the time taken for nutrient loadings already entrained in the groundwater system to reach the lake. Such increases in TN are likely to result in an overall decline in the overall trophic state of the lake with consequent adverse effects on several key indicators including TLI, cyanobacteria, colour and fisheries values.

However, despite its highly enriched state, Te Waihora/Lake Ellesmere does not exhibit regular and widespread negative or detrimental features of a highly enriched lake and it continues to support a rich biological environment including native and introduced species of plants and animals.

7. References

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Appendix 1. Wells Exhibiting Nitrate Concentrations Exceeding 11.3 mg/L

Well Number	Easting	Northing	Depth (m)	No. Samples >11.3 mg/L	Maximum Concentration (mg/L)
L35/0009	1532276	5181640	125	2	13.6
L35/1174	1532166	5187774	131	1	11.5
L36/0003	1512823	5176555	11.2	5	15.2
L36/0030	1526410	5173516	14.6	1	17.8
L36/0121	1528034	5159437	45.7	4	14.4
L36/0124	1526574	5165651	35.0	1	12.0
L36/0200	1531877	5157736	30.8	10	13.0
L36/0224	1538717	5158060	10.6	4	12.3
L36/0317	1526528	5173378	24.4	11	16.0
L36/0518	1511904	5176729	14.0	1	12.2
L36/0584	1524424	5175995	42.0	13	12.0
L36/0682	1538632	5159015	7.6	3	13.1
L36/1136	1524156	5175344	36.0	2	15.3
L36/2304	1524191	5174789	48.0	2	12.0
M35/0978	1547318	5180680	43.6	5	17.0
M35/1003	1548975	5178543	39.6	5	11.7
M35/1007	1547907	5180887	40.2	17	15.8
M35/1117	1551206	5181087	80.6	4	12.4
M35/1118	1551036	5181217	27.0	16	16.0
M35/1133	1550307	5181386	29.0	30	12.8
M36/0017	1545609	5172689	47.3	13	36.9
M36/0025	1543210	5168790	21.3	4	17.8
M36/0035	1545609	5169190	18.3	2	47.0
M36/0047	1549118	5168277	14.0	1	11.3
M36/0058	1547908	5169790	33.5	1	36.4
M36/0062	1541710	5173888		1	12.2
M36/0067	1549207	5173889		3	12.0
M36/0153	1558463	5168878	14.6	1	11.7

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Well Number	Easting	Northing	Depth (m)	No. Samples >11.3 mg/L	Maximum Concentration (mg/L)
M36/0171	1550965	5174593	36.9	1	12.3
M36/0252	1555748	5173366	17.5	2	12.0
M36/0253	1553549	5171933	26.0	2	14.9
M36/0271	1556516	5175951	25.0	2	11.6
M36/0288	1552496	5173439	21.0	11	15.0
M36/0295	1557405	5169191	8.8	9	18.0
M36/0297	1558095	5170218	7.5	4	13.5
M36/0303	1555205	5170391	23.7	2	11.9
M36/0456	1548803	5168040	9	1	11.4
M36/0460	1549258	5164172	12.2	2	13.5
M36/0628	1558304	5167692		1	16.3
M36/0889	1561071	5175963	15	2	13.5
M36/0942	1561303	5173590	3.0	2	44.4
M36/1599	1560304	5170951	4.0	1	11.7
M36/2232	1560273	5175289	16	1	13.0
M36/2285	1555910	5169768	36.6	1	14.0
M36/3670	1546008	5172689	25.5	5	28
M36/3983	1548678	5162783	12.6	1	36
M36/4044	1544009	5172389	28.9	7	19.0
M36/4126	1549150	5177595	34.1	3	12.4
M36/4151	1544665	5172396	34.1	2	11.9
M36/4227	1560377	5173587	12.0	6	12.0
M36/8187	1544679	5172402	48.0	1	13.5
M36/8202	1540808	5153101	14.8	1	11.7
M37/0065	1545298	5146557	18.3	1	13.3