Catchment context, challenges and values for Waiau

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Te Ao Marama Inc.

environment SOUTHLAND
REGIONAL COUNCIL
Te Taiao Tonga

Waiau

Ki uta ki tai (from mountains to sea)

In Southland, water shapes the landscape, the economy and the region's way of life. Water is a taonga (a treasure of the people, a sacred place). Southland has a diverse range of highly productive land uses that contribute to the region's prosperity but ongoing intensification, both urban and rural, brings challenges to the environment and communities. The Ngāi Tahu philosophy "ki uta ki tai" recognises that water is important in a variety of ways, including for customary and recreation uses. This approach also recognises that we are managing the connections between people, land and waters, such as the effects of changes to water quality and quantity on the health and function of estuaries and coastal lagoons.

Waiau Catchment

The Waiau catchment originates in the Stuart, Franklin, Earl and Livingstone Mountains to the north, extending southward past Lakes Te Anau and Manapōuri to follow the Waiau River to its outflow in Te Waewae Bay. The catchment includes elevated forest in the north and the east, and lowland plains around the lower Waiau basin in the south.

The Waiau River, Manawapōpōre/Hikuraki/Mavora Lakes, Te Ana-Au/Lake Te Anau and Moturau/Lake Manapōuri are Ngāi Tahu Statutory Acknowledgement Areas - which recognise the relationship of Ngāi Tahu with specific sites and areas, providing for this to be reflected in their management.

Historical clearance and altered drainage of land for farming and human occupation has since made the area more prone to erosion, with greater and faster water runoff and river flood flows, reduced area of wetlands and riparian habitat, and increased loss of contaminants to waterways (e.g. sediment, nutrients and micro-organisms).

Te Waewae (Waiau) Lagoon is a complex ecological system comprised of a diverse range of habitats such as shallow open water, sandy beaches, salt marshes, intertidal sand and mud flats, coastal wetlands and riparian and landward vegetation. In Te Waewae (Waiau) Lagoon, there is detailed ecosystem health monitoring available across several sites.[1] In summary, it shows that the Te Waewae (Waiau) Lagoon is in fair condition with regard to oxygen in sediment but is poor on other measures such as nutrients within bed sediment.

History of the area

Māori nohoanga (seasonal camps) used to be common on the banks of the Waiau River and throughout the catchment, with people moving along the Foveaux coast into Fiordland and the Waiau district to the kaika (villages) and nohoanga of the inland lakes. The area was rich in resources and includes many favoured mahinga kai. The inland lakes were an important stopping point between te ara tawhito (traditional routes) in Te Waipounamu (South Island).

Many European surveyors were guided into the interior by local Māori in the early and mid-1800s, along well-worn routes from the Foveaux coast that were still visible during the land clearances of the 1880s. Large and significant archaeological and artefact collections have been found throughout this catchment. The Waiau catchment has a rich and long oral history, beginning from the shaping of the land by Rākaihāutu and the sinking of Tākitimu, the waka of Tamatea, at the mouth of the Waimeamea River in Te Waewae Bay.

Tuatapere started as a sawmilling centre in the 1880s but as sawmilling declined throughout the 20th century, the town became more orientated to the rural agricultural interests in the region. As nature-based tourism grew in the Southland region towards the latter stages of the 20th century, Tuatapere became a central town along the Southern Scenic Route, which opened in 1988. Te Anau developed as a settlement following the opening of the Homer Tunnel into Milford Sound/Piopiotahi in 1953. It

[1] See: https://www.lawa.org.nz/explore-data/southland-region/lakes/waiau-lagoon/

acts as a central hub to the wider north-western Southland community, as well as one of Southland's preeminent tourist destinations.

Groundwater is managed within the Te Waewae, Te Anau and Blackmount Groundwater Zones.

Approximately 5,000 people live rurally and in the four main settlements in the catchment (Te Anau, Manapōuri, Ohai and Tuatapere). The relatively high proportion of people living rurally in these catchments is reflective of Southland and highlights strong urban and rural connections. Most towns are dependent on the economic activity created in their surrounding rural areas, and these rural areas are reliant on the facilities, services, and amenities supplied in their local towns.

Of the approximately 767,000 hectares of land in the Waiau catchment, the majority (72%) is used for conservation. Major conservation areas in the catchment include Dean Forest, Takitimu, Snowdon Forest, Mavora Lakes, and the Eyre Mountains (Taka Ra Haka). Fiordland National Park borders the catchment to the west, incorporating parts of Lake Te Anau. There is approximately 24% (185,600 ha) of land in farming, most of which is drystock and dairy support. Commercial forestry makes up approximately 3% (19,400 ha), with the remainder of land used for activities like residential and commercial use and transport (e.g. road, rail, airstrips). Approximately 593,100 ha is Department of Conservation estate and approximately 500 ha is Māori freehold land.

Te Mana o Te Wai

Mauri 1:	Maintaining the quality of water from the headwaters to the coast
Mauri 2:	Protecting and restoring springs and the quality of spring-fed waters to the coast
Mauri 3:	Protecting, restoring and re-establishing wetlands
Mauri 4:	Protecting groundwater quality
Mauri 5:	Protecting estuaries from contamination, while protecting and restoring estuary margins

Hauora

A state of hauora or healthy resilience in the Waiau catchment will be supported when:

- sources of *E. coli* from human activity are prevented from reaching waterbodies as much as possible
- erodible lands and waterbody margins are stabilised
- sediment is prevented from reaching waterbodies as much as possible
- the flow of water is slowed by reintroducing sinuosity, pools and wetland margins to straightened and channelised waterbodies
- wetlands are protected and re-established or restored
- nitrogen and phosphorus have been reduced to levels that restore water quality to within the natural range for waterbodies
- natural habitat and biodiversity are abundant in riparian margins and instream

Waiau catchment – key freshwater issues

(not in order of priority)

- Municipal wastewater and stormwater discharges.
- Sedimentation and eutrophication of some lowland streams and rivers.
- High levels of groundwater nitrogen contamination in the Otahu Flat, Clifden, Papatotara areas, exceeding drinking water standards in some locations.
- Animal faecal contamination of some lowland surface waters and main stem river sites.
- Multiple closed landfills and contaminated sites posing risk to surface waters.
- Impact of invasive freshwater species in lakes and rivers.
- Impact of significantly reduced flow in the Lower Waiau River.
- Multiple sites within the catchment with deteriorating MCI score trends.

Assessment of degradation

An assessment of which catchments are degraded has been undertaken for the Southland Region as part of regional plan development. The mapping tool will have generated whether your boundary is within a degraded catchment or not and attached the map in the appendices. The below assessment of degradation is relevant to your location:

Your land may sit within a degraded catchment

Actions must be included in the Farm Plan to demonstrate a reduction in contaminants contributing to this degradation. This definition of 'degraded' was set using a lower bar than what would be considered necessary to help achieve a state of hauora. The coming Plan Change Tuatahi will likely raise this bar to the level of hauora. To future-proof your operation you should incorporate actions that strive for a state of hauora. By default, doing this will also ensure the requirements of the Southland Water and Land Plan are met. Whilst the catchment context information provided here may give some guidance on what contaminants to focus on at a catchment scale, it is critical to utilise farm specific information when assessing contaminant loss risk and appropriate on farm mitigation actions.

Schedule X Maps

Schedule X is a new method that shows where water quality is degraded within a catchment. Using the catchment context online tool, schedule X maps (which show the status of degradation) for the following parameters are available for your farm boundary.

- Total phosphorus
- Total nitrogen
- Suspended sediment
- E-coli

The water quality in all areas needs to be maintained or improved. Not degraded catchments need farm plan actions that **minimise** contaminant losses to the smallest amount reasonably practicable. Degraded catchments need farm plan actions that **reduce** contaminant losses so as to cause a reduction in adverse effects on water quality.

Waiau contaminants

Supporting hauora outcomes

Modelling suggests that substantial nitrogen, phosphorus, sediment, and *E. coli* load reductions are required to support a state of hauora in the Waiau catchment.

There are uncertainties associated with the exact percentage reductions required.[2] What is clear is that the gap between current water state and hauora is large and that we need to take significant action to address this. Given we know these substantial catchment reductions are required, significant on farm actions are needed to head in the right direction towards achieving the desired outcomes for our freshwater. On your property these actions should focus on mitigating the specific contaminant loss risks that exist on your land.

Catchment Focus

- Reduce nitrogen, phosphorus, sediment and *E. coli* loss as much as possible.
- Build resilience to move towards hauora (planting, realigning fences and roads, oxbows, pest management, etc).

Property specific information

Each farm has its unique characteristics, such as soil type, topography, climate, land use, and management practices. Using farm-specific information allows for a tailored approach to environmental management.

To address the issue of contaminant loss, it is crucial to begin by assessing farm-specific information on potential loss pathways and associated risks. In the absence of more detailed farm-specific information, there are resources that can assist focusing mitigation efforts on your property. Considering your property's location and physiographic information, we consider that these contaminants and loss pathways must be given particular attention when choosing mitigation actions.

Soil

A soil breakdown and map are included for your property as a part of this report.

[2] Specific load reduction estimates can be found in: Snelder et al. (2021a) [Snelder et al. (2021b) [and Neverman et al. (2021) [LandCare Report (es.govt.nz)].

Climate

Southland is situated in the latitudes of the prevailing westerly winds and is the most southern and western part of New Zealand. The climate of the Waiau catchment spans the coastal, intermediate and inland climate zones. The coastal zone is subject to cold, salt-laden winds from the south and west. The intermediate zone has a generally temperate climate with few severe frosts. It is subject to both southwest and northwest winds. The inland zone lies in the northern half of the catchment and experiences severe frosts and hot, dry north-westerly winds.

Spring is the windiest and winter is generally calmer. For many but not all areas, the lowest monthly rainfall occurs in winter. Annual rainfall ranges from approx. 1,200mm in the south of the catchment to 1000-1100mm in the north.[3] Coastal areas do not typically experience dry spells, they are more common inland. Te Anau basin has the highest average number of soil moisture deficit days (approx. 20-30 annually) in the catchment compared to low elevation areas further south, although this is relatively low compared to the rest of New Zealand.[4] In low elevation coastal areas, both air and soil temperature are typically lower in the summer and higher in the winter compared to low elevation inland areas. The average daily temperature range is greater in inland areas.

Freshwater data

Water quality results can be explored on the Land, Air and Water Aotearoa website. Land, Air, Water Aotearoa (LAWA) - New Zealand You can also look at Southland's Water Story[5] for more information.

Sites of community significance

There are four main settlements in the Waiau: Te Anau, Manapōuri, Ohai and Tuatapere. Approximately 5,000 people live rurally and within the settlements.

Significant species or ecosystems

Taonga species

- Tuaki – cockles
- Pātiki – flounder
- Kūtai – mussels
- Tuna – longfin eel
- Kakakana – lamprey
- Īnaka – whitebait

[3] See: Environment Southland climate data

[4] See NIWA report - The Climate and Weather of Southland, G.R. Macara, 2nd edition https://niwa.co.nz/static/Southland%20ClimateWEB.pdf

[5] https://waterstory.es.govt.nz/

Cultural matters of importance to tangata whenua

Ngāi Tahu ki Murihiku has an enduring connection and use of this area. Historical and contemporary relationships coupled changes to the waters, land, and ecosystem have helped define current cultural matters of importance.

The Waiau River is treasured by Ngāi Tahu ki Murihiku as is the lagoon at Te Waewae Bay that has provided reliable mahinga kai resources for many generations. Shellfish such as tuaki (cockles), pātiki (flounder), kūtai (mussels), tuna (eels), kanakana (lamprey) and īnaka (whitebait) were once regularly and safely harvested and consumed. Protecting and restoring the health of the river and lagoon is a priority for Ngāi Tahu ki Murihiku.

During the southern voyages of Tamatea Ure Haea, his waka Takitimu was wrecked near the mouth of the river (Te Waewae Bay). The survivors who landed named the river Waiau due to the swirling nature of its waters. Wāhi ingoa associated with the Waiau are indicators of the range of resources the river provided: Waiharakeke (flax), Papatōtara (tōtara logs or bark), Kirirua (a type of eel found in the lagoon), Te Rua o te Kaiamio (a rock shelter that was a designated meeting place, similar to a marae) and Ka Kerehu o Tamatea (charcoal from the fire of Tamatea).

The river was a major source of mahinga kai for Ngāi Tahu, with some 200 species of plants and animals harvested in and near the river. Rauri (reserves) were applied to the mahinga kai resources so that people from one hapū or whānau never gathered kai from areas of another hapū or whānau.

It was also a major travel route connecting Murihiku and Te Ara a Kiwa (Foveaux Strait) to Te Tai Poutini (West Coast). Summer expeditions to Manapōuri for mahinga kai and access to pounamu were the main motivations for movement up and down the Waiau. Numerous archaeological sites and wāhi taonga attest to the history of occupation and use of the river by Ngāi Tahu and Ngāti Māmoe. An important nohoanga site at the mouth of the river was called Te Tua a Hatu, the Rangatira Te Waewae had his Kāinga nohoanga on the left bank of the river mouth.

Today, the Waiau is regarded as culturally degraded due to a reduction in water flows changing the identity, movement and characteristics of the river; it can no longer do the job it was naturally supposed to do. The decline in water quantity and quality has diminished the mauri of the river and barriers have restricted movement up and down it. The culmination of effects diminishes cultural uses, particularly mahinga kai, and cultural identity. Many of the cultural redress provisions in the Ngāi Tahu Claims Settlement Act 1998, such as nohoanga, are associated with water use, availability and access. Water should be in a state for Ngāi Tahu to undertake mahinga kai.

Ngāi Tahu ki Murihiku identified a range of priorities in 2020 relevant to freshwater management in the Waiau catchment. Overall, Ngāi Tahu ki Murihiku seek to protect and enhance the mauri (life force) of freshwater resources so that future generations have the same or better access to healthy waterbodies, and that waterbodies are managed within a ki uta ki tai framework. This primary goal is supported by the fundamental concept of Te Mana o te Wai in the National Policy Statement for Freshwater Management and in the proposed Southland Water and Land Plan.

Glossary

Ki uta ki tai (from mountains to sea)

Ki uta ki tai is a concept that refers to the interconnectedness of the natural world, including the relationships of water and land, from the coast up to the hills and mountains.

Environment Southland, in partnership with Te Ao Mārama, seeks to manage water and land resources in a way that reinforces the Ngāi Tahu philosophy ki uta ki tai (from mountains to sea). This integrated approach refers to the belief that all things are connected in the natural world and need to be managed that way. It is part of the foundation of regional planning in Southland, recognising the need to manage catchments as an integrated whole. This approach recognises the commitment of Environment Southland, in partnership with Te Ao Mārama, to manage the connections between people, water and land, including the impacts we have on the health of all types of waterbodies, including estuaries and coastal lagoons.

Te Mana o Te Wai

Te Mana o Te Wai is the fundamental concept that underpins all freshwater management.

Te Mana o te Wai recognises the fundamental importance of water in that protecting the health of freshwater protects the health and wellbeing of the wider environment. It is an approach that protects the mauri (life force) of the water.

Protecting mauri as a priority is already a foundation of regional planning in Southland.

Hauora

Hauora means a state of health that could be described as fit and well. It reflects a level of healthy resilience we all want for our waterways. In other words, a waterway can take a knock and bounce back and still be used without compromising people's health.

Users of water and land need to provide for hauora. By doing that, we acknowledge and protect the mauri of water. This is a foundation of regional planning in Southland.

Environment Southland and Te Ao Mārama have identified a range of attributes that in combination provide for hauora, the health and wellbeing of waterbodies.

A change to the regional plan that is being developed, Plan Change Tuatahi, will guide what is needed to support healthy waterbodies in the catchments of Waiau, Aparima, Ōreti, Mataura and Waituna.

Mahinga kai

Mahinga kai refers to the customary gathering of food and natural materials, and the places where those resources are gathered by tangata whenua.

For Ngāi Tahu, mahinga kai is about places, ways of doings things, and resources that sustain the people. It includes the work that is done (and the fuel that is used) in the gathering of all natural resources (plants, animals, water, sea life, pounamu) to sustain wellbeing. This includes the ability to clothe, feed and provide shelter.

Mahinga kai is a value that must be provided for when managing waterbodies.

Values

When we do a good job of managing freshwater then we honour a range of values that matter to the communities of Southland.

When managing freshwater we must provide for certain kinds of values; including ecosystem health (water quality, water quantity, habitat, aquatic life and ecological processes), threatened species, mahinga kai, Māori freshwater values and human contact. These are compulsory values.

There are a range of values that have already been identified by Southlanders, and additional values that must be considered as well. Many of these values informed the current regional plan, and further values are being considered as part of Plan Change Tuatahi.

Document control

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Disclaimer: This catchment context contains key information to be included in farm environmental management plans. It should not be solely relied upon. The information contained is subject to change and updates.