Catchment context, challenges and values for Oreti and Invercargill

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Te Ao Marama Inc.

environment SOUTHLAND
REGIONAL COUNCIL
Te Taiao Tonga

Oreti and Invercargill

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 recreational 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.

Ōreti and Invercargill Catchment

The Ōreti and Invercargill catchment originates in the Eyre and Thomson mountains, to the north of the Southland region. The catchment extends across high elevation in northern areas, southward across the low Southland Plains toward the New River Estuary.

The Ōreti River is a Ngāi Tahu Statutory Acknowledgement Area - which recognises 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 made the area more prone to erosion, with greater and faster water runoff and river flood flows, reduced areas of wetlands and riparian habitat, and an increased loss of contaminants to waterways (e.g. sediment, nutrients and micro-organisms).

The New River Estuary is a complex ecological system comprised of a diverse range of habitats such as shallow open water, sea grass beds, tidal pools, sandy beaches, salt marshes, intertidal sand and mud flats, coastal wetlands, and riparian and landward vegetation. In the New River Estuary, there is detailed ecosystem health monitoring available across several sites.[1] In summary, it shows that the well-flushed lower areas of the New River Estuary remain in good condition. However elsewhere the New River Estuary is in poor condition with regard to soft mud, nutrients in sediment, sea grass loss, oxygen in sediment, macroalgae cover and condition and extent of gross eutrophic zone.

History of the area

By the early 1800s there were four known Māori settlements around Waihōpai (Invercargill) and New River Estuary: Ōmāui, Ōue, Mokamoka (Mokomoko or Mokemoke), and Turangitewaru. Located at Whalers Bay on Sandy Point, Ōue was one of the principal settlements in Murihiku. The Ōreti River linked kaika (small permanent settlements) on the coast and mahinga kai of the inland lakes (specifically Mavora, Whakatipu Waimāori known as Wakatipu, and Te Anau). The coastal area of this catchment historically has had many points of occupation as Māori favoured and utilised resources from the estuaries and coastal margins.

Invercargill was established in 1856 and was originally planned as a port town with small boats taking goods up the Otepuni Creek as far as the current corner of Clyde and Tay Streets. The promise of wealth from gold helped the town grow steadily in its early years. Sedimentation in the New River Estuary made navigation a challenge from as early as 1863, resulting in a steady decline in vessel numbers and size as ship traffic transferred to Bluff. Invercargill became a municipality in 1871 and over the years the boundaries expanded to include Bluff, Myross Bush, Otatara and Makarewa.

Groundwater is managed within the Centre Hill, Five Rivers, Castlerock, Ōreti, Dipton, Lower Ōreti, Makarewa, Waihōpai and Awarua groundwater zones.

Approximately 60,000 people live in the Ōreti and Invercargill catchments. Outside of Invercargill, Winton and Lumsden townships, most people live rurally, working in the agricultural sector. Invercargill is dependent on the economic activity produced from the surrounding farming hinterland. This rural-urban connection is a prominent feature of the Southland region, where town

[1] See: https://www.lawa.org.nz/explore-data/southland-region/estuaries/new-river-estuary/

and city centres support the farming activity that exists within most of Southland's water catchment areas.

Of the nearly 400,000 ha of land in the Ōreti and Invercargill catchments, approximately 71% (280,300 ha) is now used for farming. Approximately 64,500 ha is Department of Conservation estate and approximately 5,600 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 Oreti and Invercargill 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

Oreti and Invercargill catchments – key freshwater issues

(not in order of priority)

- Municipal wastewater and stormwater discharges.
- Industrial wastewater and stormwater discharges.
- Sedimentation and eutrophication within New River Estuary.
- Contaminated land adjacent to New River Estuary and the Waihopai River resulting in pollutant discharges to water.
- Sedimentation and eutrophication of many lowland streams and rivers.
- Poor invertebrate community health in urban and intensively-farmed lowland waterways. Multiple sites within the catchment with deteriorating MCI (Macroinvertebrate Community Index) score trends.
- High levels of groundwater nitrogen contamination in the Five Rivers, Castlerock, and Winton areas. Exceeding drinking water standards in multiple locations.
- Animal and human faecal contamination of some lowland streams and main stem river sites.

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. Non-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.

Oreti and Invercargill 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 Oreti and Invercargill catchments.

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.

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.

[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)].

Soil

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

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 Oreti and Invercargill 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 around 900 - 1000mm in the mid-Oreti to 1,100mm in Invercargill and the upper Oreti.[3] Coastal areas do not typically experience dry spells, they are more common inland. Soil moisture deficit days are relatively consistent across the catchment (approx. 20-30 days), however near the Taringatura and Hokonui Hills in the mid-Oreti, the number of deficit days are lower (approx. 10-20 days). 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. You can also look at Southland's Water Story[5] for more information.

Sites of community significance

There are three main settlements in the Oreti and Invercargill zone: Invercargill, Winton and Lumsden. Approximately 60,000 people live rurally and within the settlements.

Significant species or ecosystems

Taonga species

- Tuaki – cockles
- Pātiki – flounder

[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/

- Kūtai – mussels
- Tuna – longfin eel
- Kakakana – lamprey
- Īnaka – whitebait

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 Ōreti River and its branches are treasured by Ngāi Tahu ki Murihiku as is the estuary, Kōreti (New River Estuary), 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 safely harvested and consumed regularly.[5] Protecting and restoring the health of the river and estuary is a priority for Ngāi Tahu ki Murihiku.

Kōreti was an important site and source of mahinga kai. Two main settlements, Ōue and Ōmāui were situated nearby: Ōue on the sand peninsula to the north of the estuary mouth, and Ōmāui to the south. The settlements at Ōue and Ōmāui enjoyed warmer microclimates than the mainland side. Although too cold to grow kūmara, tī kōuka (cabbage tree) were once abundant on the sandy peninsula and provided an important carbohydrate source. Shellfish were also a dietary staple. Ōue was renowned for the cockle bed on the eastern shores of the estuary. Pipi and kūtai were also common, and a short walkway, Te Ara Pakipaki, joined the settlement to the toheroa beds at Ōreti Beach.[6]

The loss of vegetation during pastoral intensification of the 1900s resulted in erosion and increased sediment. Coupled with urbanisation, land reclamation, drainage and a landfill beside the river, this has been the subject of Waitangi Tribunal evidence for Ngāi Tahu. It is an ongoing concern as the mahinga kai practices decline in the river and estuary due to concerns around the health of the system, harvesting and consumption of species.

Today, Kōreti is regarded as culturally degraded; 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 estuary. 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.

In 2020 Ngāi Tahu ki Murihiku identified a range of priorities relevant to freshwater management in Ōreti and Invercargill. Overall, Ngāi Tahu ki Murihiku seeks to protect and enhance the mauri (life force) of freshwater resources so that future generations have the same or better access to healthy

[6] Parliamentary Commissioner for the Environment (2020) *Managing our Estuaries, pp. 99-114*

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 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 are respecting and providing for a range of values that matter to the communities of Southland. Certain values are compulsory, including ecosystem health (water quality, water quantity, habitat, aquatic life and ecological processes), threatened species, mahinga kai, Māori freshwater values and human contact. There are additional values that must be considered as well, and a range of values that have already been identified by Southlanders. Many of these values informed the current regional plan

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.