North Otago FMU Snapshot

This snapshot summarises what ORC knows about the North Otago Freshwater Management Unit (FMU), to help create a vision for its fresh water.

The North Otago FMU Extends from Waitaki bridge, down through Oamaru, Moeraki, Palmerston and to the bottom of the southern branch of the Waikouaiti River.

Brief history

Rich, volcanic soils were recognised by early inhabitants for food growing. North Otago is a dry part of Otago, with some years much drier than others. Today, locals often say they are in "drought" but being dry is normal and primary production survives when it fits within that environment. Land use has tended towards more water-demanding activities including dairying more latterly since the late 1990s, with water quantity pressures faced most acutely during dry and low flow periods.

The main urban areas are dominated by Oamaru. The semi-rural areas have a mixture of residential activities, including retirement homes and lifestyle blocks and medium sized farm holdings.

Specific aspects of importance within the FMU include, the endangered galaxiids in the Kauru River, and Canterbury mudfish in low-lying tributaries on the Lower Waitaki Plains.

In Kāi Tahu tradition, the creation of the Kakaunui (Kakanui) River relates in time to Te Waka o Aoraki, the shaping of the island and the stocking of the waterways and forests. Historically, this river was an important part of the coastal trails north and south. It was also a part of the seasonal trail of mahika kai and resource gathering, and hapū and whānau bonding. Mahika kai resources associated with the Kakaunui and other water bodies (including the Waihemo/Shag River, Te Hakapupu/Pleasant River, Waianakarua, Kakaho, Waimataitai Rivers, and Trotters Creek supported both semi-permanent and seasonal settlements. The Merton tidal arm of the Waikouaiti River (Te Tauraka Poti) was a major mahika kai for kāika and pā located on the coast north of the Otago Peninsula.

The surviving rock art remnants and rock shelters associated with seasonal resource use and travel are a particular taoka of the area, providing a unique record of the lives and beliefs of tūpuna. The ability to retain and pass on knowledge of these values is of continuing importance to Kāi Tahu cultural identity.

Geography and hydrology

Medium to small river catchments flow to the sea from ranges and hills parallel to, and relatively close to, the coast. The Waianakarua, Trotters and Waikouaiti catchments have undeveloped country in

indigenous bush; the Shag and Kakanui reach into pristine subalpine tussock. These latter two rivers have naturally very low flows from November to April, with the Shag going dry in stretches (its original name being Waihemo "the river that disappears"). Rainfall varies from less than 600 mm pa in Oamaru to over 1,000 mm in the Kakanui Mountains.

There are extensive alluvium areas as outwash from the Waitaki catchment, and to a lesser extent in the other catchments; these can supply water when surface flows drop off but may take a long time to recharge. Deeper groundwater feeding in from the Maerewhenua (Canterbury region) in the Papakaio Aquifer is ancient water. Volcanic soils over Northern Otago Volcanic Aquifer's sub aquifers are still important for food-growing and market gardens use the limited groundwater.

Climate change will likely result in a trend to drier conditions, which may intensify the already dry catchments.

Water Quality

The main catchments in the North Otago region are the Lower Waitaki, Kakanui, Waianakarua, Shag and Waikouaiti. As in other areas of Otago, water quality strongly reflects the nature and intensity of surrounding land use. The upper reaches of the Kakanui, Wainakarua and Shag River catchments sit in the Kakanui Mountains and Horse Range. These areas are dominated by low producing grassland, production forestry and native cover. These low intensity land-uses typically leach low levels of nutrients and provide for good water quality. However, in the lower reaches of these rivers, the predominant land cover is high producing grassland that reflects areas actively managed and grazed for wool, lamb, beef, dairy or deer production. As rivers traverse these more intensively farmed areas, water quality tends to degrade.

The North Otago FMU contains important aquifers of various settings. These include alluvial gravels (i.e. the Lower Waitaki Plains), alluvial ribbon aquifers (e.g. the Kakanui and Shag) and deep confined aquifers (the NOVA and the Papakaio aquifer. Monitoring results from the FMU indicate severe groundwater quality issues, with the most degraded groundwater quality in the region. This includes elevated E. coli and nutrients in many bores. The alluvial ribbon aquifers exhibit significant interaction between groundwater and surface water; hence this interaction can hamper surface water quality and ecology.

Freshwater values and challenges

	What's special about North Otago FMU:	What isn't working so well:
Kā i Tahu values	• The ongoing relationship of mana whenua with wāhi tūpuna1 • Mahika kai values • Significant rock art areas	• Loss of connections to wāhi tupuna from modification of water bodies and land • Loss of wetlands • Effects of nutrient enrichment from sewage discharges and run-off on estuarine and coastal mahika kai • Effects on mauri and mahika kai resulting from water body modification, water abstraction, restriction of fish passage and environmental degradation • Loss of access to mahika kai and other significant areas

[1] Cultural landscape, encompassing places where the tūpuna travelled, stayed, gathered and used resources, and the associated stories and traditions that transcend the generations.

Environment	• High natural character values in upper catchments e.g. Kakanui, Waianakarua, Trotters Gorge, South Branch of Waikouaiti • Unmodified flows in upper catchments, at least two with long term flow record • Canterbury mudfish, lampreys, remnant examples of galaxiids in the Kauru disjointed localities • Some threatened species and high natural character values occur in mid-reaches • Geological features and artefacts include some occurring in riverbeds • The Waikouaiti River has the best water quality for sites monitored across ORC's Dunedin/Southern coastal reporting region	• Remnant indigenous fish, especially Kauru galaxiids vulnerable • Mid- catchment riparian and riverbed management are longterm issues, e.g. willows, gravel extraction • Flushing of estuaries not being sustained especially where nutrients accumulate • Sediment from forestry plantation harvesting are a likely concern • water levels decreasing, in some important aquifers • Old landfilling in aquifer recharge zones and critical source areas (leachate)
Economy	• Recreation and tourism • gold mining • Irrigation, cultivation and production of food and beverages includes dairying • Commercial and industrial use including limestone industry	• Resilience to Climate Change • Primary production not always adjusted to the drier conditions • Water source for Oamaru and smaller centres may not be affordably treatable to potable standard •
Culture and Social	• Equitable climate and rural landscape support enviable lifestyle • Amenity values, significant wetlands • Camping areas, residential camps, lodges, farmstays, B&Bs etc support tourism. • Areas with water suitable for contact recreation • Passive recreation: walking, scenic and amenity • Heritage values – Mill Dam on the Kakanui, Otepopo (Mill House) bridge, etc	• Areas with water suitable for contact recreation do not necessarily occur throughout catchments, including in estuaries • Little data on some water bodies' health