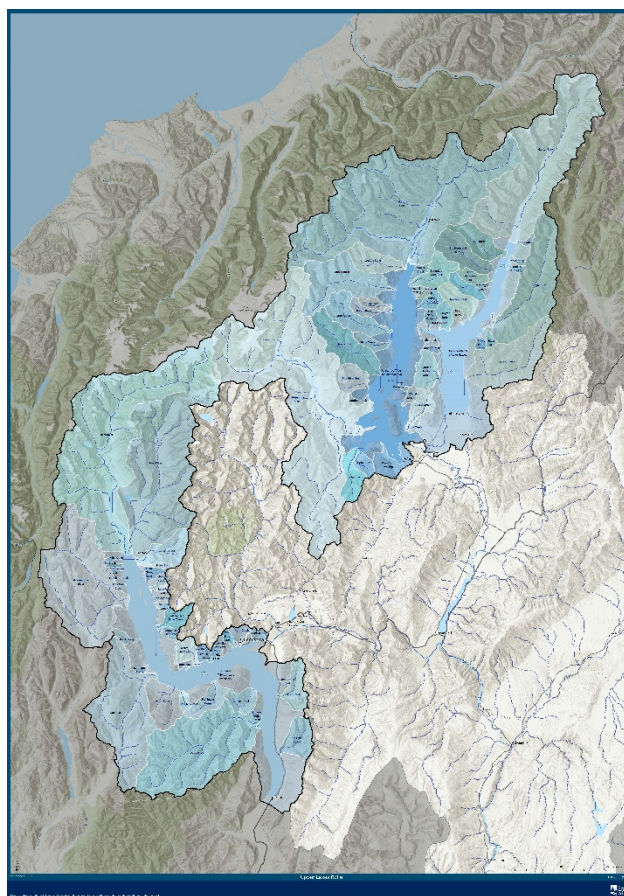


Upper Lakes Rohe Snapshot (Clutha FMU)

This snapshot summarises what ORC knows about the Upper Lakes Rohe, to help create a vision for its freshwater.

The Rohe is part of the Clutha FMU. In creating a vision for the Rohe, we also need to think about a vision for the whole Clutha which encompasses Ki Uta Ki Tai – from the mountains to the sea – and how they fit together.

The Upper Lakes Rohe covers the pristine high value lakes - Wakatipu, Wānaka and Hāwea, from their tributaries to their outlets, including the Hāwea River. Catchments include the Greenstone, Dart, and Rees Rivers, the Makarora and Matukituki, and Hunter Rivers, along with a number of smaller tributaries to the lakes, including Bullock Creek, Minaret Burn, Timaru River, and the Von and Locky Rivers. The lakes' upper catchments have very high natural values, extending into Mt Aspiring National Park.



Brief history

Lake Wānaka is protected by the Lake Wānaka Preservation Act 1973, recognising its unmodified shoreline.

The lakes have a deep spiritual significance for Kāi Tahu, associated with their creation traditions, and their importance as a source of freshwater with high levels of purity. Historically, they supported permanent and seasonal settlements and plentiful mahika kai¹. Pounamu was also gathered near the head of Lake Wānaka, and the Dart and Routeburn Valleys. The lakes, rivers and lands formed part of a network of ara tawhito,² which led all the way to the West Coast. The ability to retain and pass on knowledge of these values is of continuing importance to Kāi Tahu cultural identity.

Farming was a major industry for much of the rohe's European history, and now tourism is a major economic driver. Recent years have seen increased irrigation of pastoral land.

The rohe encompasses the tourism hot spots of Wānaka and Queenstown, the latter being one of the fastest growing areas in New Zealand. The area is renowned for its beauty and recreational opportunities, including fishing, hunting, hiking, watersports, and snowsports. Growth and development are placing pressure on the lakes with increased run off and waste disposal. Aging or insufficient infrastructure, including some clusters of on-site wastewater systems create contamination risks.

Geography and hydrology

The Clutha-Mata Au river flows from the large lakes of Wānaka, Wakatipu, and Hāwea. The lakes lie in valleys formed by glaciers, with relatively free draining alluvial soils. The main tributaries are the

¹ Food gathering, and the transfer of knowledge, custom, and practice that goes along with it.

² Old trails used for trade, transport, and resource gathering expeditions.

Matukituki and Makarora Rivers for Lake Wānaka, Dart and Rees for Wakatipu, and Hunter for Hāwea. Together, the lakes contribute 75% of the Clutha/Mata-au's flow at Balclutha, with the river's source at Lake Wānaka's outlet.

Lakes Wānaka and Wakatipu have both flooded in the past, with the 1999 Queenstown floods causing about \$50 million worth of damage. Lake Hāwea was artificially raised 20m in 1958 to store more water for increased hydroelectric power generation at the Roxburgh Dam.

The lakes and the rain shadow caused by the Southern Alps approximate a semi-arid continental climate. The upper catchment is a mixture of native bush and alpine landscapes, with some glaciers, defined by large peaks, including Mt Aspiring/Tititea. It provides habitat for endangered bird species such as Mohua and Kea. Geology is dominated by schist.

Water Quality ³

Lakes Hāwea, Wānaka and Wakatipu are characterised by very low nutrient levels and excellent water quality illustrating that human activities have not yet significantly affected the trophic state of these large lakes. Water in the tributaries feeding Lakes Hāwea, Wānaka and Wakatipu are generally of high quality, with some degradation in the lower reaches. Some of the tributaries have a naturally high suspended sediment load, due to glacial melt.

The Upper Lakes rohe includes the Hawea Basin aquifer, Kingston Groundwater Management Zone (GWMZ) and the Glenorchy GWMZ. Groundwater SoE results from the Upper Lakes generally suggests good water quality, although some local issues are also identified. These include elevated E. coli and dissolved arsenic concentrations in both Glenorchy and Kingston. The elevated arsenic concentrations in Glenorchy and Kingston are likely due to the prevalent schist lithology. The E. coli exceedances are likely due to the high density of septic tanks in the townships and potentially to poor borehead security and/or shallow bores. Groundwater issues in the Hawea basins include high water use for irrigation and contamination risk of shallow bores.

Freshwater values and challenges

	What's special about the Upper Lakes rohe:	What isn't working so well:
Kai Tahu	<ul style="list-style-type: none"> • The deep spiritual significance of the lakes in Kāi Tahu traditions • The ongoing relationship of mana whenua with wāhi tupuna⁴ • Mahika kai values • Pounamu 	<ul style="list-style-type: none"> • Loss of connections to wāhi tupuna from modification of water bodies and land • Effects of water body modification and environmental degradation on mauri and on mahika kai • Loss of access to mahika kai and other significant areas
Environment	<ul style="list-style-type: none"> • Scenic values (e.g. Remarkables, Mt Aspiring National Park) • Pristine upper catchments (e.g. Dart, Makarora, Matukituki) • Excellent overall water quality (Lakes, upper catchment areas) • Native bush and wildlife (Kea, Mohua) 	<ul style="list-style-type: none"> • Dams affecting fish passage, especially tuna migration. • Urban pressures on lakes • Run off from agriculture and urban areas. • Pests, including lagarosiphon in Lake Wānaka, stoats and rabbits. • Some increasing contamination trends. • Lack of data in some areas.

³ SOE Monitoring Report 2006 to 2017, except where otherwise stated.

⁴ Cultural landscape, encompassing places where the tūpuna travelled, stayed, gathered and used resources, and the associated stories and traditions that transcend the generations.

Economy	<ul style="list-style-type: none"> • Hydro Storage at Hāwea • Amenity/Adventure tourism • Agriculture. • Recreation and holiday destinations. 	<ul style="list-style-type: none"> • Covid 19 restrictions • Climate change resilience
Social	<ul style="list-style-type: none"> • Recreation – hiking, Snow skiing, water sports, fishing etc. • Amenity and associative values • Heritage places. 	<ul style="list-style-type: none"> • Cost of living • Housing availability