



Otago
Regional
Council

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MEMORANDUM

To: Anita Dawe
From: Jason Augspurger, Dean Olsen, and Tom Dyer
Date: 04/03/2024
Re: LWRP surface water quantity programme summary

Purpose

The purpose of this memo is to summarize the surface water quantity programme completed for the Otago Land and water regional plan (LWRP).

Context

The Otago Regional Council's (ORC) current suite of reports have been developed to inform the new LWRP and provide information for setting environmental flows in Otago's rivers.

Region analysis

To provide an initial assessment of ecological effects as a result of altered flow regimes across Otago, results from a regional hydrological model were compared to guidance on precautionary environmental flow limits (Hayes et al. 2021; Friedel et al. 2023). This comparison highlighted that the majority of Otago's catchments have low allocation levels which comply with the precautionary guidance (Ravenscroft and Stewart 2023). This means current allocation pressure is unlikely to have a measurable environmental effect. Likewise, implementing a precautionary flow regime in such catchments is likely to have little impact on current users.

However, under the existing Regional Plan: Water (RPW, ORC 2004), allocation in these catchments could increase beyond such precautionary environmental flow limits. Increasing allocation may result in environmental effects and these catchments being considered as over-allocated in the future. Further, if allocation was to increase in these catchments, there may be negative impacts on other ecosystem health components such as water quality. It may be acceptable to have an allocation limit beyond the default guidelines in some catchments, but measures which prevent

allocation from exceeding the guidelines without appropriate consideration are required.

Bespoke catchment modelling

Bespoke modelling was undertaken for some catchments which exceed the precautionary guidance. This modelling indicates existing flow regimes in some catchments pose a medium or high risk to ecological values. These catchments include the Manuherekia (Allibone 2021; Dyer 2023), Cardrona (Ravenscroft et al. 2017), Kakanui (Olsen 2023a), Low burn (Olsen 2023b), Waianakarua (Olsen 2024a), Shag (Olsen 2024b), Luggate (Olsen 2024c) and the Waikouaiti (Olsen 2024d). In these catchments, abstraction currently results in lower flow for longer periods than would naturally occur. This reduces habitat availability for some fish and aquatic invertebrate species and may result in a risk of reduced flow variability at low flows. As a result, increases in minimum flow and/or decreases in allocation may be required in these catchments to decrease ecological risk. These changes would be expected to decrease reliability of supply for irrigators.

In other catchments, including the Pomahaka (Olsen 2024e), Mill Creek (Olsen 2023c), and the Waiwera (Olsen 2024f), the existing flow regime poses a low risk to ecological values.

In both low and high-risk catchments, the existing planning framework often allows more abstraction than is currently seen, i.e., the current consented abstraction rates and volumes may exceed those currently exercised. This currently allows consent holders to increase their water abstraction before expiry of the consent. Therefore, while the realized risk from abstraction may currently be low in some catchments, there is potential for the risk to increase if no measures are put in place to restrict further abstraction (Olsen 2023c). In catchments with high risk, increased allocation would result in further risk.

Misallocation and resolving over-allocation

The historic and current planning framework also fail to effectively manage legacy issues present in Otago's water allocation. In many cases, stored water is consented, and metered as if it were primary allocation (Augspurger 2023). Generally, large dams are filled during winter or large rainfall events which would be considered as high flow water thus falling in a supplementary block(s). This water has already been "taken" and therefore should not be considered as primary, or low flow, allocation. Failing to split stored water out of the primary allocation block means the primary allocation block is overly large.

An overly large primary block, consisting of stored water and run of river water, poses significant challenges for policies aimed at reducing allocation. To re-apportion stored water into appropriate allocation blocks, future plans must provide appropriate measures which distinguish stored water from run of river takes, such as separate metering. This re-apportioning would form the part of any allocation "reduction" in catchments with stored water.

Potential to reduce uncertainty

There are uncertainties associated with the studies informing the setting of environmental flows in Otago's rivers. In the short to medium term (5-10 years), it is unlikely that these uncertainties can be significantly reduced. These types of assessments require long-term monitoring data. To reduce uncertainty, more sites with long records would be required, particularly in locations of natural flow. Therefore, while additional nuance may be added, the overall conclusions from the suite of studies are unlikely to change.

Conclusion

From the suite of reports related to surface water quantity for the LWRP, we can conclude:

Many catchments in Otago have a medium to high ecological risk due to water abstraction. These catchments require higher minimum flows and/or lower allocation to decrease their risk level.

The current water plan allows for an allocation of up to 50% of MALF. This means that in catchments where current water use does not exceed the default guidance, or in catchments with natural flow regimes, allocation is allowed to exceed the precautionary guidance without any further assessment. This could result in additional catchments being over-allocated.

Historical consenting of stored water has resulted in poorly structured water allocation. The current plan does not have a mechanism that will allow for re-apportioning of allocation. A planning framework which differentiates between stored water that is used later, and true primary allocation is required. This will clarify the abstractive pressure on some waterways and resolve the potential over-allocation in some catchments in the future. Such catchments include the Taieri and Manuherekia.

Water allocation can interact with other anthropogenic pressures (e.g., climate change, land use changes, degrading water quality). Changes in the state and trends of water quality and ecological state in many Otago catchments shows that these have changed since the development of the RPW (Augspurger and Dyer 2024). In addition, there has been significant progress in our understanding of the projected effects of climate change on Otago's water resources, and therefore on environmental outcomes. Observed degradation in water quality and ecological state along with the future changes expected under a warming climate justify a cautious approach to water allocation.

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