

Setting limits for water use in the Wairarapa Valley, New Zealand

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ABSTRACT

The Wairarapa Valley occupies a predominantly rural area in the lower North Island of New Zealand. It supports a mix of intensive farming (dairy), dry stock farming (sheep and beef cattle) and horticulture (including wine grapes). The valley floor is traversed by the Ruamahanga River, the largest river in the Wellington region with a total catchment area of 3,430 km². Environmental, cultural and recreational values associated with this Ruamahanga River are very high. The alluvial gravel and sand aquifers of the Wairarapa Valley, support productive groundwater aquifers at depths of up to 100 metres below ground while the Ruamahanga River and its tributaries present a further source of water for users. Water is allocated to users via resource consents by Greater Wellington Regional Council (GWRC). With intensifying land use, demand from the surface and groundwater resources of the Wairarapa Valley has increased substantially in recent times and careful management is needed to ensure values are maintained.

This paper describes the approach being taken to manage water resources in the Wairarapa Valley and redefine appropriate limits of sustainable water use. There are three key parts:

Quantifying the groundwater resource. A FEFLOW numerical groundwater flow model was developed by GWRC. This modelling phase provided a much improved understanding of aquifer recharge and abstraction processes. It also began to reveal the extent of hydraulic connection between aquifer and river systems and the importance of moving towards an integrated (conjunctive) approach to allocating water.

Development of a conjunctive management framework. The FEFLOW model was used to quantify the stream flow depletion impacts of a range of groundwater abstraction scenarios. From this, three abstraction categories (A, B and C) that describe diminishing degrees of hydraulic connection between ground and surface water resources were mapped in 3 dimensions across the Valley. Interim allocation limits have been defined for each of 17 discrete management units within the valley based on both local scale aquifer recharge and stream flow depletion criteria but also cumulative impacts at the valley-wide scale. These allocation limits are to be further refined into agreed final limits through a community-led decision making process.

Community involvement in the limit setting process. Historically in New Zealand, limits for sustainable resource use have been established primarily on the basis of 'hard science' and the decision making process has been driven by regional councils. Community involvement in limit setting processes has been through consultation rather than active participation. Recent legislation in the form of a National Policy Statement on Freshwater Management (2011) is reforming this approach. In particular, collaborative consensus-based decision making with active engagement from stakeholders is now expected. With this in mind, a committee of Wairarapa local people with a wide range of backgrounds was established in 2014. The role of this committee is to make final recommendations about resource use limits (including allocation of water) that reflect the aspirations of the communities they represent. To assist the committee in taking a holistic view it is intended that the existing numerical groundwater flow models will be coupled with with surface flow, contaminant transport, biological and economic models. This will provide the basis for assessing the likely outcomes of a range of future land use and resource limit scenarios.

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