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Committee Regulatory  
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## Overview of instream flow investigations for Wairarapa streams

### 1. Purpose

To update the Committee on progress with investigations into minimum flows for Wairarapa streams.

### 2. Background

Knowledge of the flow requirements to protect instream values (such as ecological, recreational and Maori cultural and traditional values) is vital for effective and sustainable management of water resources. Greater Wellington has an ongoing programme for assessing instream flow requirements<sup>1</sup> of rivers and streams in the Wellington region. The objective of the programme is to provide scientific information to use as a basis when recommending or reviewing minimum flows in the Regional Freshwater Plan; this information will be particularly important for the review of the Regional Freshwater Plan (due to commence by December). The minimum flow policies are used to implement restrictions on abstractions from rivers and streams during times of low flow.

An internal review in 2007 looked at where Greater Wellington's priorities should lie for carrying out scientific investigations into instream flow requirements. The prioritisation exercise took into account each waterway's ecological and recreational values and the existing and anticipated abstractive demand (eg, for irrigation and public water supply). These factors were combined to determine a 'risk' score for each waterway, which relates to the risk of water abstraction causing adverse effects on instream values. Recommendations were made to ensure that all waterways with high risk scores are investigated so that appropriate minimum flows can be incorporated into the Regional Freshwater Plan.

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<sup>1</sup> 'Instream flow requirements' are the flows that are required to be maintained in order to protect the values of that waterway

### **3. Focus on small streams in the Wairarapa**

Of the 20 waterways assigned the highest 'risk' score, six are Wairarapa streams: Mangatarere Stream, Papawai Stream, Parkvale Stream, Otukura Stream, Booths Creek and Stonestead Creek. The other 14 highest risk waterways (according to the review) are the Ruamahanga River and many of its tributary rivers, and the Hutt, Wainuiomata and Waikanae rivers.

Of the six Wairarapa streams identified as 'high risk' in the review, only one (Mangatarere Stream) currently has a minimum flow policy specified in the Regional Freshwater Plan. The remaining five streams were included in Plan Change 3, which capped the abstraction allocation limit at the existing level – effectively meaning that no further abstraction from those streams is allowed. It was therefore deemed important that scientific investigations be carried out in order to propose appropriate minimum flows for these streams.

The review also highlighted the need to investigate instream flow requirements of larger Wairarapa rivers (eg, Ruamahanga, Waingawa and Waiohine rivers) to ensure the existing minimum flows in the Regional Freshwater Plan are set at appropriate levels. Progress with those investigations will be reported to the Committee later in the year.

### **4. Progress with small stream investigations**

For the Otukura Stream (east of Featherston) and Papawai Stream (near Greytown) Greater Wellington has been trialling a process of consulting stakeholder groups about instream values, and combining this information with scientific knowledge to assess instream flow requirements. By including stakeholders early in the process we hope to avoid some of the disagreement that can occur at the stage when minimum flows are proposed, because the stakeholder knowledge will be considered and incorporated into our investigations.

#### **4.1 Otukura Stream**

A report on instream flow requirements of Otukura Stream was completed in May 2008. The report included a summary of instream values with contribution from Department of Conservation and Ngati Kahungunu ki Wairarapa. The instream values were found to be degraded, due to poor water quality, extreme low flows and a high degree of channel modification.

Critical factors for improving ecological values of the stream were chosen for assessing instream flow requirements of the Otukura Stream; these were water temperature and dissolved oxygen concentration. Analysis of field data using the NIWA model WAIORA found that:

- High water temperatures (in excess of 25°C) may occur during low flow and extreme climatic conditions;

- High instream temperatures are unlikely to be avoided through flow management in the Otukura Stream, at least in the stream's current hydraulic and riparian condition;
- Dissolved oxygen is a potentially critical issue for the Otukura Stream during times of low flow, and daily minimum dissolved oxygen concentrations are predicted to decline rapidly at flows less than 40 L/s;
- A flow of 95 L/s in the critical reach of the Otukura Stream (at the Greater Wellington flow monitoring site) is predicted to maintain daily minimum dissolved oxygen above the 6 mg/L threshold for long-term protection of aquatic life.

The report recommended that a minimum flow of 95 L/s for the Otukura Stream be considered for the Regional Freshwater Plan.

## **4.2 Papawai Stream**

An instream flow assessment for the Papawai Stream is due to be completed by the end of June 2009. In November 2008 Environment Management staff attended a meeting of the Papawai Stream Restoration Group at Papawai Marae to outline the objectives of the instream flow investigations. A representative from the Restoration Group is to provide Greater Wellington with a description of community and tangata whenua values associated with the stream.

The Environmental Monitoring and Investigations department has been operating a flow monitoring site on the Papawai Stream since December 2005, and continuous dissolved oxygen and temperature monitoring was installed in January 2007. These data will be analysed along with the values information to recommend a minimum flow, and a summary report will be prepared.

## **4.3 Other small streams**

Work is being carried out to determine the flow characteristics of other small Wairarapa streams; this work includes the installation of a continuous flow monitoring station on the Parkvale Stream in mid-2007. It is likely that minimum flows for the Parkvale Stream, Booths Creek and Stonestead Creek will be proposed using historical flow analysis (eg, the recommended minimum flow will be a set proportion of the mean annual low flow). This method of analysis is recommended for streams with low instream values in the supporting documentation for the proposed National Environmental Standard for Ecological Flows and Water Levels. Historical flow analysis requires good information about flow characteristics, but is less intensive in terms of information on ecological characteristics and water quality.

A report recommending minimum flows for these streams will be prepared in 2009/10 to support the review of the Regional Freshwater Plan.

## **5. Issues and challenges**

The work being carried out has highlighted several issues and challenges facing the science and policy of minimum flows:

- The ecological values of many small streams – particularly those being studied in the Wairarapa – are low due to poor water quality and habitat degradation. Although water abstraction is a stressor, the management of flows alone is unlikely to result in an improvement in the ecological values because of the high degree of stock access and a lack of riparian vegetation along many of the rural streams.
- There is a lack of guidance from central government on methods for analysing flow requirements to sustain instream values of small streams. This means we are spending a considerable amount of time researching different methods, and we are open to challenge on the methods that we select for use. When the proposed National Environment Standard for Ecological Flows and Water Levels is completed (along with supporting guidance documents) it will hopefully reduce the threat of environment court proceedings that we may face – particularly for when we develop water allocation policies and methods for the next Regional Freshwater Plan.
- Seeking input from stakeholder groups on instream values is a time-consuming process, and can be subject to considerable delays. In addition, some stakeholders appear to find it frustrating that the instream flow programme is about managing flows, rather than taking a holistic approach to addressing all issues of water quality and quantity together.

## **6. Communication**

The Otukura Stream instream flow assessment report was sent to Department of Conservation, Fish & Game, Rangitaane o Wairarapa and Ngati Kahungunu ki Wairarapa. When the report on the Papawai Stream is completed it will also be sent to stakeholder groups.

The findings of both reports will be summarised in a new report to support the proposed minimum flow policies for the ‘new’ Regional Freshwater Plan. Resource consent holders and the general public will have the opportunity to make submissions during the plan consultation and notification process.

## 7. Recommendations

*It is recommended that the Committee:*

1. ***Receives the report; and***
2. ***Notes the contents.***

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