caring about you & your environment

Report 02.720
28 November 2002
File: ENV/5/3/12
[Report 2002.Env02720.MH:mm]

Report to Environment Committee
from Mike Harkness, Hydrologist

Instream Habitat Assessment for the Wainuiomata River

1. Purpose

To inform the Committee of the results of an investigation and report into the available fish habitat in the Wainuiomata River undertaken as part of a review of the Regional Freshwater Plan minimum flow levels.

2. Background

The Regional Freshwater Plan sets minimum flows for various rivers throughout the Region that seek to allow people and communities to take or use water whilst ensuring flows are sufficient to maintain the natural, ecological, and amenity values of the water bodies. As these minimum flow levels are under constant scrutiny because of the effect they have on resource users, we need to continually question, validate, and update the scientific assumptions upon which the various Regional Plans were based. With this in mind we have commenced a programme to review the minimum flows set in the Regional Freshwater Plan. The programme started last year by reviewing the minimum flow levels set for the Hutt River, and this year focussed on the Wainuiomata River.

The results from the minimum flow reviews will be passed on to the Resource Policy Department for consideration in the next Regional Freshwater Plan review. The Strategy and Assets Department of Utility Services, with an interest through their water supply abstractions, will also be informed of the findings.

The Regional Freshwater Plan sets a minimum flow to be maintained in the Wainuiomata River of 300 litres per second (L/s) at Leonard Wood Park (just upstream of the former sewage treatment plant). The Wainuiomata Water Treatment Plant operates upstream of Leonard Wood Park and has a significant effect on the flow regimes of the river, lowering the flow significantly during the summer and autumn

months. Over the past few decades the river has been below the minimum flow level about 25 percent of the time during these months.

The Instream Flow Incremental Methodology (IFIM) was used to determine the amount of suitable habitat available for brown trout at a range of river flows. The Wainuiomata River is a regionally significant trout fishery and setting minimum flows to maintain trout habitat will not only benefit trout (and trout fishers!), but also native fish as they require a smaller amount of habitat than brown trout.

The current minimum flow of 300 L/s was actually set using IFIM results from the other rivers such as the Hutt, Akatarawa, Otaki and Waikanae rivers and extrapolating the results to the Wainuiomata River. A number of problems have been identified with this approach. The most significant is that the rivers used are much bigger than the Wainuiomata River and that an actual "on-site" investigation should be the basis of setting a minimum flow based on instream habitat rather than regional extrapolation.

3. Report Summary

Three reaches of the Wainuiomata River were surveyed for the study. These were; (i) at Leonard Wood Park, (ii) at the Wainuiomata Golf Course, and (iii) at Pencarrow Station. At each of these three reaches a number of cross sections of the river were surveyed, water velocities measured, and the composition of the river bed (e.g. gravels, sand, vegetation etc) was noted.

This information allows us to predict water depths and velocities for a range of river flows. The river's ability to support brown trout over this range of conditions was assessed using software developed by NIWA.

Two methods to determine a minimum flow that maintains an adequate level of trout habitat were used:

(i) Maintain two-thirds of the available trout habitat as measured at the average annual low flow. This method has been used in the Region previously to derive minimum flows for the Hutt, Otaki and Waikanae rivers.
(ii) Maintain a minimum proportion of trout habitat that is equivalent to that exceeded by 85 percent of rivers used in a national survey. This method is more suitable for smaller rivers (such as the Wainuiomata River) and, because it does not use measured flow, the results are not affected by the modified flows in the river (as a result of the Water Treatment Plant abstraction).

As well as using the IFIM method to assess trout habitat, a package called WAIORA (Water Impacts On River Attributes) was also used to provide a comparison. WAIORA is used by the Wairarapa Division in water allocation issues and in addition to assessing instream habitat it can model how variables such as water quality and temperature will change when water is abstracted from a river.

4. Major Findings

The current Regional Freshwater Plan minimum flow, which was determined by a regional extrapolation from other rivers, is not applicable to the Wainuiomata River.

The results from the study show that the minimum flow level in the Wainuiomata River is too low and it should be increased to 420 L/s. This is a 40 percent increase on the current Regional Freshwater Plan value.

This study indicates that the minimum flow of 300 L/s is providing lower percentages of brown trout habitat and food producing habitat than the minimum flow level set in the Hutt River.

Water abstraction for the Wainuiomata Water Treatment Plant is having a major effect on flow in the Wainuiomata River, consistently causing it to drop below the current minimum flow. New consent conditions, imposed last year, on the amount of water that can be abstracted will supposedly keep the river flow above the 300 L/s mark. Monitoring over the coming summer will see if this is so. More stringent conditions would be required if the minimum flow is changed to 420 L/s.

The IFIM method is considered superior to the WAIORA method when determining a minimum flow based on trout habitat. IFIM is based on a great deal more collected data such as river substrate, vegetation and water velocity, and has been tried and tested over a number of years throughout the New Zealand and world-wide. WAIORA has been developed in the streams of the Auckland region, which are quite different to others around the country, and various agencies have found it lacking in many aspects.

Instream habitat modelling is far superior with the IFIM method and it will continue to be used as the tool of choice.

5. Future Work

A work programme will be defined to progressively complete IFIM studies on other rivers throughout the Region to continue questioning the assumptions of the Regional Freshwater Plan and contribute to possible amendments. The Hutt and Wainuiomata Rivers have now been completed and in this financial year the focus turns towards the Kapiti Coast. At this stage the Waitohu Stream is the probable candidate for the work, although this choice could change depending on developments as Kapiti Coast District Council seek new water sources.

6. Communications

The results of this work will be communicated to NZ Fish and Game Ltd.

7. Recommendations

It is recommended that the Committee:

(1) ***receive*** *the report; and*

(2) ***note*** *the contents.*

Report prepared by:

MIKE HARKNESS
Hydrologist, Resource Investigations

Approved for submission:

JOHN SHERRIFF
Manager, Resource Investigations

JANE BRADBURY
Divisional Manager, Environment