Addendum to Original Report

Minimum flows for proposed Reefton PS on the Inangahua River.

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9 November 2017

Background

The report "Proposed Hydro-electric Project Inangahua River: Assessment of Hydrological and Environmental Effects" Report: IJ1219 dated May 2013 discussed minimum flows for the 2 km of river that would be affected by the operation of the proposed power scheme. The report suggested a minimum flow of 2 m^3/s. Fish & Game were concerned that the operation of the scheme would result in the flow being less than 2.3 m^3/s (the mean annual low flow (MALF) of the Inangahua River at Reefton) for an average of 88 days per year and the Powerhouse Trust has suggested that the minimum could be increased to MALF (2.3 m^3/s) over the period February to April inclusive).

Effect of increasing late summer minimum flow to 2.3 m^3/s

The turbine of the proposed power screen at Reefton is capable of operating at flows of between 1.2 and 3.5 m^3/s (the previous assessment assumed the minimum was 1.4 m^3/s).

With a minimum flow of 2.3 m^3/s between February and April and 2 m^3/s at all other times, the 2 km section of river would be less than MALF for an average of 63 days per year[1]. The flow would be at or less than MALF for 90 days per year. Naturally, the flow is less than MALF for an average of 14.4 days per year.

The median length of the times when the flow is below MALF is 3 days but in an average year the maximum duration of flow less than MALF is 11 days. If the duration of flows less than or equal to MALF is considered, the median length of time that flows are at or less than MALF is still 3 days, with an average a maximum duration of 11.4 days.

The average residual flow would be 13.6 m^3/s, the median flow 4.6 m^3/s, and the mean annual minimum flow would be reduced to 1.9 m^3/s. This is compared to the natural flow where the average flow is 16.33 m^3/s, the median flow 8.1 m^3/s, and the mean annual minimum flow 2.3 m^3/s.

Brown trout spawning habitat was assessed in the original report and showed that there was very little suitable spawning habitat in the survey reach and that a flow of 1.8 m^3/s provided maximum brown trout spawning habitat. Thus, a winter minimum of 2 m^3/s should provide a suitable spawning flow with little if any benefit from a higher flow. An increase in flow from 2 m^3/s to 2.3 m^3/s would increase the water level by 20 mm. The minimum passage depth through the reach is 0.35 m at a flow of 2 m^3/s, so

[1] For period 15th May 1965 – 8th January 2013.

the increase in flow would only increase the minimum passage width from 0.35 m to 0.37 m. A passage depth of 0.25 m is usually considered adequate for adult trout.

As stated in the original report, the main effect of the power scheme would be on food production for adult trout and an increase in minimum flow only has a minor effect on this. Thus, there is likely to be a reduction of up to 28% in the number of adult trout in the 2km reach that is affected.