Comment on minimum flow setting in the Ruamāhanga whaitua June 2018

What is a torrentfish?

Torrentfish (named Pānako in Māori) are an indigenous freshwater fish species that are only found in New Zealand. They favour swift water such as the rapids and riffles of gravel-bed rivers and adults can grow to about 20 cm in length. The low gradient of the Ruamāhanga River means that they penetrate well inland and they are found in the catchment at least as far as Masterton, and likely further inland. Because of their preference for swift flowing water, torrentfish are one of the more sensitive indigenous species to modifications in flow and hydraulic habitat.

Further information on the torrentfish is available here:

https://www.niwa.co.nz/freshwater-and-estuaries/nzffd/NIWA-fish-atlas/fish-species/torrentfish.

More recently, the torrentfish have been given a threat classification by the Department of Conservation of "*at risk – declining*". We do not have a detailed understanding of population numbers, condition or changes over time in the Ruamāhanga catchment as monitoring data is limited.

Selection of torrentfish for minimum flow assessments

For the gravel-bed river tributaries of the Ruamahanga catchment, minimum flow assessments focused on ecological values, and especially the amount of physical habitat available to fish at low flows. In these types of rivers it is considered more likely that habitat space becomes a limiting factor for some fish communities before things like water temperature increases and oxygen level depletion. Torrentfish were chosen by the Ruamāhanga Whaitua Committee as the target species for this assessment because they represent a part of the indigenous fish community that is likely to be the most sensitive to changes in flow regime.

While trout were not explicitly selected as a target species for objective-setting, they were considered in the Committee discussions and modelling. Trout are commonly used as the indicator species for flow setting in New Zealand. Results suggested that the minimum flows predicted to give effect to the torrentfish objectives would generally be very similar to the flows needed to give the same level of habitat protection to trout.

Habitat retention criteria – why 90%?

The Ruamāhanga Whaitua Committee looked at minimum flow requirements relating to a range of habitat objectives for torrentfish. The primary objective that was subsequently chosen for all rivers was to retain 90% of the habitat that is available at natural 7 Day Mean Annual Low Flow (MALF). This choice was made after modelling results were presented to the Committee and risks relating to different habitat thresholds (i.e. 70%, 80% and 90%) were described. There is further discussion about the rationale for risk categories in Sections 3.4.1 e and f and Section 4 of the following report:

http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Minimum-flow-and-allocation-options-for-the-Ruamahanga-River-and-major-tributaries.pdf

The risk framework presented to the Committee drew on a school of thought that has been well described by researchers in this field; the main principle being that there is often no obvious point at which habitat becomes significantly compromised by low flow and therefore the choice of habitat retention ought to reflect the significance of the fish values being considered and appetite for risk. In other words, the amount of habitat reduction deemed acceptable is more a matter of choice (based on understanding risks and values) than explicit ecological science.

In applying this thinking in the Ruamāhanga context, the risks of adopting different thresholds for torrentfish were broadly described to the Committee as:

- 70% = questionable for maintaining a healthy baseline population (but considered by some to be a bottom line), and could be difficult to justify if indigenous fish are highly valued

- 90% = likely to maintain a population and reduce the risk of abstraction at low flows contributing significantly to habitat loss. This level of habitat retention could be considered conservative but justifiable to minimise risk to a fish community of high value.

The habitat retention figure chosen is a value judgement. It is not a science decision. The range of community values were considered in making this decision. However, the statutory requirement to safeguard life-supporting capacity, ecosystem processes and indigenous species is paramount.

Applying 90% habitat retention criteria to minimum flows

Modelling showed that in most sub-catchments the existing (and Proposed Natural Resources Plan) management flows used to control most abstraction consents are generally consistent with this objective. However, the existing minimum flows in the Waipoua and Upper Ruamāhanga provide a habitat for torrentfish of about 70% of that available at MALF. In choosing to recommend higher minimum flows to reduce risks relating to indigenous fish habitat and improve consistency across catchments, the Committee was also mindful that other values (that had been identified as compromised at times of low flow) in these two catchments may also benefit (e.g. cultural values).