

BEFORE THE HEARINGS PANEL

IN THE MATTER of the Resource Management Act 1991 ('the Act')

AND

IN THE MATTER of Proposed Plan Change 9 to the Hawke's Bay
Regional Resource Management Plan

**STATEMENT OF REPLY EVIDENCE OF DANIEL RYAN FAKE FOR HAWKE'S BAY
REGIONAL COUNCIL**

1. INTRODUCTION

1.1 My name is Daniel Ryan Fake

1.2 I hold a Bachelor of Science in Environmental Studies and Geography from the Victoria University of Wellington 2011, and a Master of Science degree in Environmental Science from the University of Waikato, 2019. My post graduate research focussed on fish passage.

1.3 I am currently employed as a Scientist in the Water Quality and Ecology team at the Hawkes Bay Regional Council (**HBRC**), and have held this position for 2 years. Prior to that, I held the position of Resource Technician in the Water Quality and Ecology team for 8 years, as well as holding an intern position in the hydrology team for 3 months. In my scientist role, I have coordinated and have taken leading roles in the fish monitoring, fish passage, and whitebait enhancement programmes. I have authored two State of the Environment technical reports. In my previous role as a Resource Technician, I undertook numerous fish and stream invertebrate surveys, as well as routine water quality investigations. I have also completed flow gauging at 61 river and stream sites around Hawkes Bay.

1.4 I have prepared this evidence in my capacity as an expert, and although this is not a court hearing I confirm that I have read and understand the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note dated 1 December 2014. I have complied with it when preparing my evidence, and I agree to comply with it when I give any oral evidence. Other than where I state that I am relying on the evidence of another person, my evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Purpose and scope of evidence

1.5 The purpose of this evidence in reply is to address matters raised in statements of evidence filed by submitters.

1.6 I do not repeat matters that are addressed in the Tūtaekurī, Ahuriri, Ngaruroro and Karamū (**TANK**) Section 32 Evaluation Report (**Evaluation Report**) nor the memo in Appendix 11 appended to the Hearing Report on Proposed Plan Change 9 (**Hearing Report**). However, to assist the Panel, where another witness has raised a significant matter that have already been addressed (and which I do not wish to discuss further), I provide a cross-reference to this report.

- 1.7 I comment on matters raised by other witnesses only where I consider that what they are saying may not be correct or that it should be qualified.
- 1.8 For the avoidance of doubt, any failure to cross reference or specifically discuss any matter raised by other witnesses does not mean I agree with that evidence of the other witnesses.
- 1.9 My evidence will address matters raised in the evidence of Mr Marei Boston Apatu at points ii and v (page 13) and Mr Maurice Wayne Black at paragraph 202.
- 1.10 My evidence addresses the Ngaruroro cease take trigger flows, referred to as minimum flows in Proposed Plan Change 9 (**PPC9**), and their effect on torrentfish habitat.

2. KEY FACTS AND ASSUMPTIONS RELIED ON

2.1 In preparing my evidence I have reviewed the following documents and evidence:

- (a) TANK Evaluation Report; and
- (b) Appendix 11 from the TANK Hearing Report.

3. EXECUTIVE SUMMARY

- 3.1 Mr Marei Boston Apatu and Mr Maurice Wayne Black expressed concerns around the proposed Ngaruroro River cease take trigger flow, and its associated predicted habitat protection level of 44% for torrentfish. Both submitters argued for raising the cease take trigger flow due to these concerns.
- 3.2 It appears that Mr Apatu and Mr Black may have misunderstood the concept of habitat protection level. A 90% habitat protection level does not directly equate to 90% survival or 90% protection. The assessment of habitat protection level is a relative and risk-based approach that feeds into the overall weighting of various scenarios around managing water resources. A larger reduction in habitat protection infers a higher level of risk to that species in relative rather than absolute terms.
- 3.3 A more thorough hydrological understanding is required to assess the potential environmental benefits that a cease take limit would provide (e.g. allocation volumes, natural recession rate), which is covered in the evidence of Mr Waldron.
- 3.4 In my opinion, in the case of the Ngaruroro River, a higher cease take trigger level is unlikely to provide a meaningful benefit to torrentfish or other fish species.

4. EVIDENCE

Habitat protection and flow setting

- 4.1 The Evaluation Report briefly discusses flow management regime decisions with respect to habitat protection levels for torrentfish.
- 4.2 Hydraulic habitat models, such as RHYHABSIM (River Hydraulic Habitat Simulation), predict the change in velocity and depth with flow, based on intensive surveys of channel shape and flow characteristics (Jowett, 2001). By comparing RHYHABSIM predictions of depths and velocities to the depths and velocities used by fish (termed 'habitat criteria'), these methods can generate habitat-flow curves that describe the change in weighted usable area with flow. Standard practice for this method is to base decisions around the fish species with the highest flow requirements. In the case of the Ngaruroro River, torrentfish were chosen.
- 4.3 These habitat flow curves are then converted to habitat protection levels, with the habitat available at MALF (**Mean Annual Low Flow**) often used as a reference (i.e. habitat available at MALF is deemed 100% of available habitat), as shown in Figure 1.

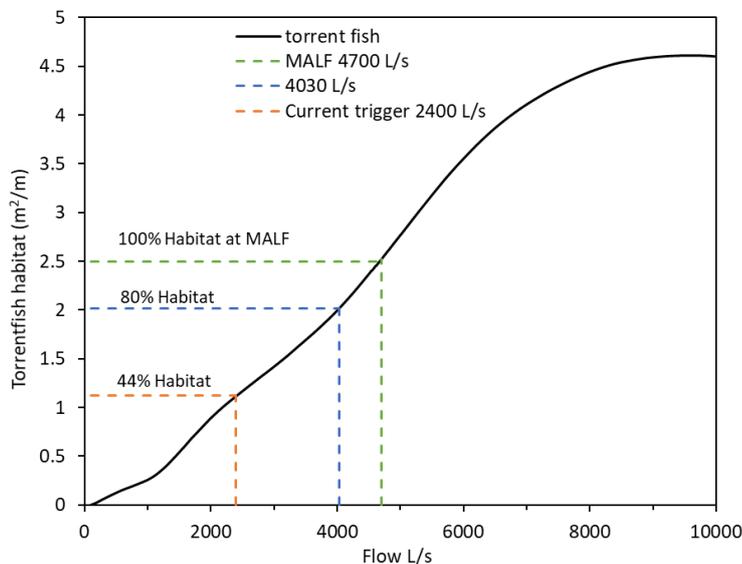


Figure 1. A representative example of a habitat-flow curve for torrent fish. This example shows habitat suitability in terms of area habitat (m^2) per m of river reach. Various measures of habitat suitability are combined into a single measure that is then rated according to flow regime (coloured lines).

- 4.4 The model predicts that the proposed cease take trigger flow of 2400l/s will provide 44% protection of torrentfish habitat.

- 4.5 Points ii and v from page 13 of Mr Apatu's evidence suggest that MALF provides 100% survival and protection of this species, and that a protection level of 44% puts the population at risk of extinction.
- 4.6 I think Mr Apatu's argument is based on a misinterpretation of the habitat protection values. The modelled protection levels do not predict the scale of any effect on these species and therefore do not predict species survival or abundance. For example, a habitat protection level of 44% does not mean there will only be sufficient habitat for 44% of torrentfish, or that only 44% will survive at that flow, but simply that there is 44% of the habitat available at that flow relative to the amount that was available at MALF.
- 4.7 A more thorough hydrological assessment of the system is required to assess the potential environmental benefits that a cease-take limit would provide (e.g. allocation volumes, natural recession rate), which is covered in the evidence of Mr Waldron.
- 4.8 Table 47 of the Section 32 Report, the Memo in Appendix 11 of the Section 42A Report and reply evidence from Mr Waldron highlights why an increase in the cease-take trigger flow levels would have minimal benefit to torrentfish and other species. For example, there would only be a 3.3% increase to MALF, and a 0.5% increase at Q95 flows if the cease-take trigger flow was increased to 4,000 l/s (Waldron, 2018).
- 4.9 Put simply, increasing the cease take limit would not be expected to increase torrentfish habitat protection in a significant way.

5. CONCLUSION

- 5.1 It appears the concept of habitat protection level has been misunderstood by Mr Black and Mr Apatu when they have argued for an increase in the cease-take trigger flow level.
- 5.2 A more thorough and nuanced assessment of hydrological effects is required to understand what benefits a higher cease-take trigger level would have. This is provided in Waldron (2018). In the case of the Ngaruroro River, a higher cease-take trigger level is unlikely to provide a meaningful benefit to torrentfish or other fish species.

REFERENCE

Waldron, R. 2018. *Surface water quantity scenario modelling in the Tutaekuri, Ngaruroro and Karamu catchments. Greater Heretaunga and Ahuriri Plan Change (PC9)*, Resource Management Group Technical Report, HBRC Report No. 5013 – RM 18-28, Hawke's Bay Regional Council, Napier, New Zealand.