

File Note

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From: Dean Olsen
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Re: Request for further information by Hearing Committee for PC5A
(Lindis Integrated Water Management)

The Hearing Committee for Plan Change 5A (Lindis Integrated Water Management) has requested further information from the Otago Regional Council.

Instream habitat modelling was undertaken in the Lindis River in 2002/2003 by NIWA Jowett & Wilding (2003) and this information was also presented in the ORC report "Management Flows for Aquatic ecosystems in the Lindis River" (ORC 2008). The following habitat suitability curves were used in the instream habitat modelling for the Lindis River:

Presented in Figure 4.1 of ORC (2008):

Longfin eel (<300 mm) (Jowett and Richardson 1995)
Common bully (Jowett and Richardson 1995)
Upland bully (Jowett and Richardson 1995)
Brown trout fry to 15cm (Raleigh et al 1986)
Brown trout spawning (Shirvell and Dungey 1983)
Brown trout yearling (Raleigh et al 1986)
Brown trout adult (Hayes and Jowett 1994)
Flathead galaxias (*G. depressiceps*) (Baker et al. 2003)
Rainbow trout spawning (Tongariro) (Jowett et al. 1996)

Habitat suitability curves presented in Jowett & Wilding (2003) but not included in ORC (2008):

Roundhead galaxias (*G. anomalus*) (Baker et al. 2003)

Graphical representations of these habitat suitability curves are included as an appendix to Jowett & Wilding (2003), but can be provided, if required.

References

Jowett, IG, Wilding TK. 2003. Flow requirements for fish habitat in the Chatto, Lindis, Manuherikia, Pomahaka and Waianakarua Rivers. *NIWA Client Report HAM2003-052*. 29 p. + appendices.

Baker, CF, Jowett IG, Allibone RM 2003. Habitat use by non-migratory Otago galaxiids and implications for water management. Department of Conservation, *Science for Conservation 221*.

Hayes JW, Jowett IG 1994. Microhabitat models of large drift-feeding brown trout in three New Zealand rivers. *North American Journal of Fisheries Management* 14: 710-725.

Jowett, IG, Richardson J 1995. Habitat preferences of common, riverine New Zealand native fishes and implications for management flow assessments. *New Zealand Journal of Marine and Freshwater Research* 29: 13-24.

Jowett IG; Rowe, D.; West, D. 1996: Fishery flow requirements of the Tongariro River. *NIWA client report ELE301*. 140p.

Otago Regional Council 2008. Management Flows for Aquatic ecosystems in the Lindis River. Otago Regional Council, Dunedin. July 2008. 50 p. + appendices.

Raleigh, RF, Zuckerman LD, Nelson PC 1986: Habitat suitability index models and instream flow suitability curves: brown trout, revised. *U.S. Fish and Wildlife Service Biological Report* 82 (10.124).

Shirvell CS, Dungey RG 1983. Microhabitats chosen by brown trout for feeding and spawning in rivers. *Transactions of the American Fisheries Society* 112: 355-367.