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*Test of an environmental flow release in the Bridge River, British Columbia: does more water mean more fish? \** Bradford, M.J., Higgins, P.S., Korman, J. and Sneep, J. 2011.

Freshwater Biology, in press.

Abstract

Water managers must make difficult decisions about the allocation of streamflows between out-of-channel human uses, and environmental flows for aquatic resources. However, the effects environmental flows on stream ecosystems are infrequently evaluated. We used a 13 year experiment in the regulated Bridge River, British Columbia, Canada, to determine whether an environmental flow release designed to increase salmonid productivity was successful. A hierarchical Bayesian model was used to compare juvenile Pacific salmon (*Oncorhynchus spp*.) abundance before and after the flow release. We found that the total number of salmonids did increase after the release, but most of the gains could be attributed to the rewatering of a previously dry channel located immediately below the dam. In reaches that had flowing water during the baseline period the response of individual salmon species to the increase in flow was variable, and there was little change in total abundance after the flow release. Our results were inconsistent with both habitat modelling, which predicted a decrease in habitat quality with increasing flow, and holistic instream flow approaches that imply greater benefits with larger flows. We question whether biotic responses to flow changes can be predicted reliably with currently available methods, and suggest that adaptive management or the use of decision tools that account for the uncertainty in the biotic response are required for instream flow decisions when the competing demands for water are great.