Abstracts

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BIASES IN ESTIMATING FISH POPULATIONS DUE TO LARGE WOOD AND OTHER PHYSICAL HABITAT IN OREGON CASCADE STREAMS. P.B. Bayley, J. Burgess, and S.V. Gregory. Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331, USA.

The efficiency of an intensive capture process (catchability) was determined from 3 backpack units used simultaneously, including one applied by a snorkeler underwater, in pools of Lookout and Tidbits Creeks, Oregon Cascades. Efficiency was expressed as numbers caught from a single pass from all units, divided by the original number present, which was determined from a known number of marked fish released in their locations of capture in a blocked off pool the previous day. Each stream received four treatments of distinct quantities of large wood, and were sampled during two summers, resulting in 32 calibrations. Catchability was modeled for salmonids, dominated by coastal cutthroat (*Onchorynchus clarki*) and cottids. For salmonids fish size and amount of large wood were highly significant effects. No species effects (cutthroat versus rainbow) could be detected among salmonids. The fitted model of salmonid catchability was a set of unimodal curves as a function of fish length, with peak catchabilities of 0.74 for zero wood, and 0.57 for the densest wood treatment (6.2 mean wetted wood area as percent of water surface area) that corresponded to a fish length (fork) of 135 mm. The salmonid model predicted corresponding values of 0.58 and 0.39 respectively for fish 50 mm long. As with salmonids less than 135 mm, cottid catchability increased with fish size (27 - 81 mm). However, in contrast to salmonids, catchability of cottids (dominated by C. bairdi) was unaffected by the amounts of large wood tested, but was affected negatively by the proportion of substrate that was cobble and boulder combined. For cottids 50 mm long the model predicted values of 0.49 and 0.19 corresponding to cobble and boulder coverages of 50% and 100% respectively. These models demonstrate quantitatively what many experienced field biologists suspect, and conform to known refuge habitat preferences of each taxon. The results also demonstrate the danger of presuming abundance or relative abundance of fish from catch data only, which can lead to serious underestimates of, for example, the effect of large wood on salmonid abundance.

EXPERIMENTAL REINTRODUCTION OF LARGE WOODY DEBRIS FOR RIVER REHABILITATION AND STABILISATION: AN EXAMPLE FROM THE HUNTER VALLEY, SOUTHEASTERN AUSTRALIA. A.P. Brooks[1], T.B. Abbe[2], M. Taylor[1], P. Gehrke[3], H. Jones[4], D. Outhet[4], E. Avery[4]. [1]Dept. Physical Geography, Macquarie University, Sydney, Australia, [2]Phillip Williams and Associates, Consultants, Seattle, WA USA, [3]New South Wales Dept. Fisheries Port Stephens Research Centre, Australia, [4]New South Wales D.L.W.C. Centre for Natural Resources, Australia.

Introduction

In Australia, where indigenous freshwater fisheries are virtually non-existent, river rehabilitation using anything other than traditional engineering approaches is in its infancy. With recent research into the geomorphic role of LWD as a control on channel morphology in Australian rivers (eg. Cohen, 1997; Brooks, 1999; Marsh 1999), there has been a surge of interest amongst river managers in reintroducing large wood into Australian rivers. Yet, at present there is very little information about how this should be done, at what point in the channel recovery cycle it is most appropriate, and what outcomes can be expected. Due to a number of characteristics of Australian rivers – e.g. high discharge variability, the large bankfull capacity of many post-European disturbance channels, sediment supply limited channels, and the virtual absence of contemporary LWD inputs – much of the international geomorphic and engineering literature on LWD reintroduction is not directly transferable to Australian conditions. Similarly, the direct and indirect relationship between LWD and aquatic habitat is poorly understood for Australian conditions. For these reasons, a multi-faceted experimental research project has been undertaken to assess the benefits and practical realities of LWD reintroduction into Australian rivers.

Project Objectives

1) To design and assess the performance of LWD structures under conditions appropriate to southeastern Australia, suitable for both habitat rehabilitation and as alternatives to traditional engineering strategies for channel stabilisation;
2) Assess geomorphic changes induced in the experimental reaches associated with the LWD structure emplacement;