

Long-term response of salmonid populations to habitat restoration in a boreal forest stream (Van Zyll de Jong & Cowx 2016) [1]

Assessing the sustainability of restoration measures for salmonid populations and their habitat is limited due to a lack of long-term evaluations. In this paper we report on a study to assess the effect of boulder clusters, V-dams and half-log covers on stream habitat and population abundance of Atlantic salmon and brook trout two decades after installation. Structures were installed in Joe Farrell's Brook, Newfoundland Canada in 1993 and fish population and habitat parameters were initially measured annually from 1993 to 1995. All stream sites were re-sampled in 2014.

Boulder clusters or V-dams remained intact, stable and functional. By contrast, only 60% of the half-logs were in place and those remaining were in relatively poor shape with limited functionality. Boulder clusters increased the percentage area of pool habitat (p = 0.05) and the availability of instream cover (p = 0.04). V-dams did not significantly alter any habitat component after 20 years. Half-log covers were effective in increasing instream cover (p = 0.02) and substrate coarseness (p = 0.01). Density and biomass of Atlantic salmon increased rapidly after structures were installed and remained significantly higher 20 years after the pre-treatment period (1993) than the sub-basin control. By contrast brook trout did not show significant increase in density or biomass in either V-dams or half-log covers but did showed significant increases in both boulder cluster (density p = 0.002; biomass p = 0.01) 20 years later. This study suggests that instream structures placed in small boreal streams can function for more than two decades when properly installed and can

maintain higher levels of salmonid abundance when habitat is limiting.

Keywords

Atlantic salmon: Brook trout: Habitat: Restoration: Boreal

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Page 1 of 1