

Influence of rainfall and beaver dams on upstream movement of spawning Atlantic salmon in a restored brook in Nova Scotia, Canada

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Abstract

In a restored, third-order stream in northern Nova Scotia, Canada, we used redd counts over 12 years to examine the influence of beaver dams and the timing and intensity of autumn rains on spawning activity of Atlantic salmon. Most beaver dams in most years had no detectable effect on the distribution of spawning redds, but in 2004 the density of redds downstream from a three-dam complex was significantly greater than that above, suggesting the dams were a barrier to many fish. A second complex of dams blocked salmon passage completely in 2003 and 2004 until they were notched to provide access upstream. The length of stream used by salmon for spawning was linearly correlated with total precipitation in the basin in October plus November ($R^2 = 0.60$), to a ceiling of 325 mm, above which the fish had access to the entire brook, if beaver dams were notched. Number of redds in the whole brook was strongly correlated ($R^2 = 0.94$) with the coefficient of variation (CV) of daily rainfall in October, but only for 7 of 11 years. This relationship disappeared when the impassable beaver dam complex failed in 2005, allowing salmon free access to 4 km of the upper brook. Variation in rainfall, and hence discharge, in this flashy brook evidently influences migration and spawning of Atlantic salmon in conjunction with channel blocking by beaver dams. Copyright © 2009 John Wiley & Sons, Ltd.