

**Effects of artificial woody structures on Atlantic salmon habitat  
and populations in a Nova Scotia stream.**

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**Abstract**

A 1-km reach of Brierly Brook, Nova Scotia, was studied from 1995 to 2004 to determine if the addition of artificial structures mimicking large woody debris could enhance Atlantic salmon populations. In 1995, digger logs (which mimic fallen trees) and deflectors (which narrow the channel) were constructed in a 250-m section of the brook devoid of woody debris (Old Restored Site). In 2003, 5 more digger logs and deflectors were built in a previously unrestored section of the stream (New Restored Site). A third control site was left unchanged. Physical changes caused by the structures were monitored at the New Restored Site. Densities of juvenile and spawning Atlantic salmon were also monitored. At all sites, woody debris structures in the brook were important and effective in creating complex salmonid habitat. The structures narrowed the channel, scoured pools and undercut banks. They created habitat that parr used for summer and winter refuge and adult spawners used for cover and resting during upstream migration and spawning. The structures caused gravels to accumulate that spawning adults used to build redds and fry used for shelter. The reaches with structures had higher spawning densities than reaches without them; spawning increased in the New Restored Site relative to the control site. The absence of woody debris may be a bottleneck for salmonid populations in streams of the Atlantic Northeast. For streams with a small or immature riparian zone and little woody debris in the channel, woody structures may be an effective tool for restoring salmonid populations.