Summary

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Abstract:

The Toulnustouc River is a major affluent of the Manicouagan River on the north shore of the St. Lawrence Estuary (Québec). During the years 2001 to 2005, a 526 MW powerhouse as well as a dam of a height of 77 m were built by Hydro-Québec as part of the Toulnustouc hydropower project. The new powerhouse was commissioned in 2005.

In order to sustain fish production in the areas affected by the project, a fish habitat compensation programme was initiated in 2004, in which brook charr *(Salvelinus fontinalis)* was selected as the target species. As required by Fisheries and Oceans Canada, this compensation programme included the improvement of brook trout habitats, as well as a follow-up of the physical condition and use of these habitats by brook charr for a period of ten years.

This study presents the results from three investigations conducted in July, August and October 2006 in order to assess the condition and use by brook charr of the improved habitats. In terms of physical stability, all artificial spawning grounds were in good condition except for one (Larose stream). The surface area, as well as the thickness of gravel layer, were similar to values measured at the completion of construction works. Gravel quality is deemed good in general, although some spawning grounds were affected to various degrees by compaction, clogging and sedimentation. Wooden weirs (n=48), rock weirs (n=11) and "Syvde" weirs (n=12) were mostly intact. Two "Syvde" weirs, however, were in poor condition.

Brook charr was found in high density (>30 fish / 100 m^2) in eight out of ten improved streams. Of the three streams which have been monitored both before and after habitat improvement works, two streams (T5 and T13) showed significantly higher densities after (2005 and 2006) than before improvement (2002 to 2004). In tributary T1 (Rocque River), no significant change was observed in brook charr density. In fall 2006, brook charr embryos were found at 10 of the 16 improved streams. In addition, the high density of brook charr in most tributaries (with the exception of tributary T1 and Larose stream) indicate that habitat conditions were favourable for the first stages of development of this species.

Overall, monitoring results indicate a good performance of the habitat improvement works, both in terms of physical stability and brook charr production.

Key words: Toulnustouc, brook charr, compensation programme, habitat improvement, spawning ground
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