Hydro Québec

Alliance environnement inc. 2005. *Dérivation partielle de la rivière Portneuf. Suivi environnemental 2005 en phase exploitation – Productivité des rivières établie à l'aide de la pêche à l'électricité.* (**Partial diversion of the Portneuf River. Environmental monitoring in 2005 (operation phase). River productivity determined by electrofishing**.) Alliance environnement inc. Report submitted to Hydro-Québec, Montréal (Qc), 62 pages and appendices.

Abstract

Environmental monitoring after partial diversion of the Portneuf River continued in 2005. The objectives of this study are: 1) determine the changes in juvenile fish density and in the biological characteristics of brook trout in the Portneuf River and Rivière aux Sables and in tributaries P5 and P6 by means of electrofishing; 2) assess brook trout productivity in these rivers.

Electrofishing was conducted from July 19 to August 1, 2005. The sampling protocol was identical to 2002 and 2003. In the Portneuf River, six 100-m^2 plots were sampled at each of the nine fishing stations, for a total of 54 plots, compared to 28 plots in the Rivière aux Sables, 6 plots in tributary P5 and 4 in tributary P6. An additional plot near the river bank and 18 in the centre of the Portneuf River were sampled in 2005 for comparison purposes. The recorded brook trout densities and biological characteristics were used to assess productivity in the Portneuf River and Rivière aux Sables using the POTSAFO program.

The main results obtained in this study are the following:

- Brook trout was the dominant species in all of the streams surveyed. Its relative abundance was 83% in the Portneuf River and more than 95% in the Rivière aux Sables and tributaries P5 and P6. In the Portneuf River, the proportion of brook trout in the catches was similar to that in 2000 and higher than in all the other years of the study.

- Brook trout densities in 2005 were statistically higher than those recorded in 2000-2001 but remain comparable to those in 2002 and are similar to or greater than the 2003 densities in each of the streams surveyed.

- Sucker and stickleback densities obtained in 2005 were not statistically different from preceding years. Although an upward trend was observed in the Portneuf River in 2003, densities in 2005 were once again similar to those recorded in 2002.

- The size of juvenile brook trout (0+) increased from 2003 to 2005 in all the streams, but juveniles remained smaller than in 2002. These differences are significant for each of the streams surveyed except for tributary P5. The high

juvenile densities observed in 2005 in the Portneuf River and Rivière aux Sables and the increased intraspecific competition may explain their small size.

- Harvestable biomass for 2005, assessed with the POTSAFO method, ranged from 2,473 to 2,555 kg/year in the Portneuf River and from 506 to 529 kg/year in the Rivière aux Sables, and remained comparable to the baseline values (year 2000 to 2002).

- The overall productivity of the Portneuf River (including the lakes it encompasses) assessed during the first years of monitoring during operation (3,346 to 4,002 kg/year) was similar to that of the three reference years (2,844 to 4,635 kg/year).