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English title :

Environmental monitoring of the Robertson reservoir (1990-2010). Evolution of the mercury level in the flesh of fish.

Abstract :

In 2010, the environmental monitoring of Robertson reservoir focused on mercury levels in the flesh of the main fish species and on their stomach content. Overall, this study represents the seventh year of monitoring and the sixth since impoundment 15 years ago (i.e. 1995).

Fish dominates the diet of smelt in the reservoir (85 % of the total stomach content, in biomass), and smelt is the only identifiable fish species found in their stomachs. Benthos dominates smelt stomach contents in Lake Monger (96 %), in brackish waters. The diet of brook trout is composed mainly of benthos in lakes (28 %) and of fish in the reservoir (48 %) and in Lake Monger (68%). This discrepancy is mainly explained by the larger average size of brook trout captured in the reservoir. In this latter species, the main prey species in the reservoir are sticklebacks since 2001, as was the case before impoundment, while in 1999 it was smelt. The diet of arctic charr is composed mainly of fish in the reservoir (61%) and in lakes (20-40%). Domination of fish as prey in reservoir arctic charr also occurred prior to impoundment but not since, probably because the larger specimens of the species were scarce in the catches from 1999 to 2005, but were in sufficient numbers in 2010 to allow prey examination. Finally, the diet of landlocked salmon is composed mainly of fish in reservoir (59%), lakes (83%) and in Lake Monger (87%), and smelt was the main prey everywhere.

In the four species monitored in Robertson reservoir, average mercury levels at standardized length increased after impoundment by factors ranging from 2.7 to 4.9 depending on species. The average mercury level in large specimens of arctic charr (350 mm) was the highest in 2010, but catches from 2001 to 2005 were insufficient to calculate accurate means, when the real maximum would realistically have occurred. In 350-mm brook trout, a significant decrease occurred in 2010, after the maximum observed in 2005, 10 years after impoundment. In 350-mm landlocked salmon, 200-mm rainbow smelt and 200-mm arctic charr, the average maximum levels were reached respectively four (1999), six (2001) and eight (2003) years after impoundment, and decreased significantly thereafter.

Downstream of the reservoir, in the brackish waters of Lake Monger, average mercury levels in both 200-mm smelt and 350-mm brook trout are, since 2005, lower than those of the range of values typical of freshwater natural lakes of the area. In 350-mm landlocked salmon of Lake Monger, this happened for the first time in 2010.

According to the results obtained in 2010, the number of meals per month recommended in the fish consumption guide, produced in 2001 for the Gros Mécatina region, has become too restrictive for smelt, brook trout and landlocked salmon. It is also too restrictive for all fish species captured in the Monger Lake. New recommendations to revise this guide will be submitted to the Agence de la santé et des services sociaux de la Côte-Nord.

Key words : Mercury, fish, Robertson reservoir, environmental monitoring

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