

Transactions of the American Fisheries Society 132:57–68, 2003
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The Effect of Whole-Lake Nutrient Enrichment on Mercury Concentration in Age-1 Yellow Perch

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Abstract.—We evaluated the effect of whole-lake nutrient enrichment on Hg concentration in age-age-1 yellow perch *Perca flavescens* and assessed whether reduced Hg concentration in fish from enriched lakes could be attributed solely to enhanced fish growth (i.e., growth dilution). A survey of yellow perch in eighteight reference lakes and twotwo experimentally enriched lakes (P input = $2\text{--}6 \text{ mg} \cdot \text{m}^{-2} \cdot \text{d}^{-1}$; $N : P > 25 : 1$ by atoms) indicated that yellow perch Hg concentration was highly correlated with lake pH and nutrient enrichment ($R^2 = 0.87$). Age-1 yellow perch were four to five times larger and had 50% lower Hg concentrations in enriched lakes than in reference lakes of an equivalent pH (reference lakes = $0.24 \mu\text{g Hg/g}$ wet mass; enriched lakes = $0.11 \mu\text{g Hg/g}$). A mass balance model of Hg dynamics indicated that growth dilution could only account for 30–40% of the reduction in yellow perch Hg concentration, suggesting that lake enrichment produced effects on fish Hg concentration that were not explained by differences in growth rate. A change in yellow perch diet likely explains the remainder of the difference in yellow perch Hg concentration between reference and enriched lakes.