CAN MEASUREMENTS OF STRESS BIOMARKERS OF A TOP PREDATOR HELP ASSESS THE EFFECTS OF HIGH DAILY FLOW VARIATIONS IN A HYDRO-PEAKING RIVER?

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Abstract

A field study on fish stress has been conducted in a context of natural flow regime alteration. The study took place in a hydro-peaking river, where hydropower facilities usually run in response to a high demand in energy. Therefore, events of massive and unpredictable flow discharge happen daily. The effects of this high flow variation have been assessed in a top predator, *Esox lucius* (Northern pike). A total of 40 fish have been caught in Mississagi River, regulated by Aubrey Falls Dam, and Aubinadong River, unregulated, both situated in Northern Ontario. Aubinadong River serves as a control for absence of high variations in flow, related to hydro-peaking management strategy. The natural river, which is a tributary of the regulated river, has similar physical characteristics of Mississagi River. Chosen traditional stress biomarkers are part of the primary, secondary and tertiary physiological responses*.* Besides, a heat shock proteins (HSP) expression assessment has been conducted on Northern pikes to determine the relationships between traditional stress biomarkers and HSP expression in fish cells. Assessing stress state of fish in regulated river is important for conservation of natural fish populations. By providing useful tools and concrete recommendations for healthy fish populations, this study will help dam hydropower managers to take decisions regarding their future hydropower flow management strategy.