HydroNet Project Title: Behavioural and biomechanical aspects of fish passage in lake sturgeon.

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Rationale: Hydropower dams create barriers to fish passage for many migratory species throughout the world. Fish passage is commonly reinstated at these sites through installation of engineered structures collectively termed fishways. However fishways are often unsuccessful at passing numerous species, including sturgeons. This is a pertinent issue considering all members of this unique family undertake some form of migration to spawn in freshwater and many are threatened.

Description: My research will focus primarily on sturgeon passage at a successful fishway: the Vianney-Legendre fishway on the Richelieu River in Quebec, Canada. Specifically I plan to examine the factors that contribute to attraction and passage efficiency of sturgeon at fishways, evaluate the behavioural characteristics of successful and unsuccessful migrants ascending a fishway, calculate the energetic cost of fishway passage for sturgeon and link biological information with a hydraulic model of the fishway to identify the shear forces that sturgeon are exposed to in areas of difficult passage.

Outcomes: This study will be one of the first in Canada to combine detailed assessments of fish behaviour with different hydraulic conditions in the field. Collectively, the integrated studies on fish behaviour and hydraulic engineering will serve as a model for future studies that are needed to address the role of human-altered and natural flow variability on fish distribution, energetics, and ultimately fitness.

Benefits from this research: To date, efforts to provide upstream and downstream passage facilities for sturgeon have been largely ineffective. The proposed research will provide the necessary hydraulic and biological information to improve passage for these imperilled fish