1st NSERC HydroNet Symposium, Winnipeg Delta

April 29thand 30th, 2011

*Behaviour and passage success of fish using a vertical slot fishway in Quebec: case studies incorporating a single and multispecies approach.* \*J. D. Thiem, T. R. Binder, J. W. Dawson, P. Dumont, D. Hatin, C. Hatry, C. Katopodis, K. Smokorowski, K. Stamplecoskie, D. Zhu and S. J. Cooke. \*Fish Ecology and Conservation Physiology Laboratory, Carleton University, Ottawa ON Canada. (Email: [jthiem@connect.carleton.ca](mailto:jthiem@connect.carleton.ca))

Abstract

The freshwater spawning migrations of many species have been influenced by the development dams which create barriers to migration. Although fishways are commonly installed to reinstate passage at these sites, their success at passing target species often remains unknown. We conducted two field studies at a vertical slot fishway on the Richelieu River in Quebec during May and June 2010 to: 1) determine passage success of lake sturgeon at the fishway and, 2) examine the utility of this fishway as a model for a multispecies approach. An extensive Passive Integrated Transponder (PIT) antenna array enabled us to quantify passage success, passage rates and determine the spatial location of individuals. In the first study, migratory lake sturgeon (n=107, 939–1625 mm TL) were captured, PIT tagged and released into the fishway. Sturgeon exhibited an ability to traverse the 70 m fishway quickly (minimum passage rate of 1.2 hrs), however, successful passage rates were variable (6.2–75.4 hrs from release) and only 30% successfully ascended. In the second study, 17 species comprising 492 individuals were captured in a fish trap, PIT tagged and released into the fishway. Passage efficiency was highly variable among species (range 0–100%), however >50% for seven of the species encountered (Atlantic salmon, carp, channel catfish, freshwater drum, smallmouth bass, walleye and white sucker). Passage rates were likewise highly variable both among and within species (e.g., 1.0–452.9 hrs for smallmouth bass, 2.4–237.5 hrs for shorthead redhorse). These results are discussed in the context of balancing fishway design for priority species while maintaining diversity.