1st NSERC Hydronet Symposium- Delta Winnipeg

March 29th and 30th 2011-06-03

*The thermal and spatial ecology and associated entrainment risk of burbot* (Lota lota) *in a large hydropower reservoir in Southern British Columbia, Canada*.P.M.Harrison1, L. Gutowsky2, S.J.Cooke2, M.Power1

1University of Waterloo, Department of Biology

2Carleton University, Department of Biology

Abstract

The burbot *Lota lota* is a fairly recent marine coloniser of freshwater and the only member of the cod family (*Gadidae*) to complete its entire lifecycle in freshwater. While burbot are abundant through much of their circumpolar distribution, many populations towards the southern edge of their North American range are threatened or in serious decline. In Canada, burbot are often found in impounded hydropower reservoirs and a recent collapse of a number of burbot fisheries in the highly impounded Columbia River watershed has highlighted the vulnerability of burbot to hydropower infrastructure development. Despite burbot’s unique life history, and a recent increase in scientific interest in the species, many aspects of burbot thermal and spatial ecology and interactions with hydropower operations remain poorly understood. Given the global increase in hydropower demand and predicted global temperature rises, improving our knowledge of burbot thermal and spatial ecology and entrainment risk in hydropower systems may be essential for the future conservation of this important recreational and subsistence fishery species. In light of the risks of hydroelectric development to burbot and current knowledge gaps, the general objectives of our research are: 1) To further our understanding of burbot thermal and spatial ecology in hydropower systems and the influence of hydropower operations on burbot behaviour; 2) To investigate and determine the factors that influence burbot entrainment risk and inform on entrainment mitigation and compensatory strategies. In order to address these objectives our research will focus on Kinbasket Reservoir and Mica Dam, located in south eastern British Columbia, and will utilize three linked studies: 1) a thermal ecology study utilising thermal and depth telemetry and otolith thermometry; 2) a spatial ecology and entrainment risk study utilising a broad-scale presence/absence acoustic telemetry array; 3) A fine-scale study of burbot behaviour in the vicinity of turbine intakes utilising a positional acoustic telemetry array.