Hydroacoustic Mapping of Fish Habitat Use in a Hydropower Reservoir

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Abstract

To assess habitat use and production by fishes in a hydropower reservoir in eastern Manitoba (Lac du Bonnet), a splitbeam Biosonics DTX scientific echosounder operating at multiple frequencies (1000, 430, and 200 kHz) was used to conduct full systematic surveys and near-shore tracks that circumscribed the reservoir. Resolution was at a scale of metres along transects and approximately 300 metres between. Acoustic data were used to map bathymetry and develop classification criteria for bottom types. Physical sampling was used to assist classification according to depth, bottom substrate (bedrock/boulder; gravel/cobble; sand; mud) and the presence or absence of submerged aquatic vegetation. Distribution of fishes and plankton, and size-frequency spectra derived from single targets from acoustic surveys, were spatially referenced to habitat maps to determine if variation in distribution and productivity occurs among habitat types. In addition, diel variation in habitat use and depth preferences of fishes will be examined.