

Fisheries Impact Review

Ojibway Power and Energy Group (OPEG) Draft Environmental Report Namakan River Hydro Development Project

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1. Qualifications

I have 32 years experience in the area of fish communities and limnological conditions in boreal forest lakes and reservoirs in Saskatchewan, and in Voyageurs (MN) and Isle Royale (MI) National Parks. My work in the national parks involved the identification and assessment of the effects of factors such as reservoir management, invasive species, environmental contaminants, and fisheries management on the health and viability of the park ecosystems. Because Voyageur's large lakes are international waters, I have significant experience collaborating with MNDNR and Ontario MNR biologists as well as numerous scientists from both the US and Canada. I instigated and was actively involved in a collaborative study of lake sturgeon in Rainy Lake. I also served on the Border Waters lake sturgeon technical committee for several years.

In 2008 I was honored by the Lake of the Woods Water Sustainability Foundation who established and presented me with the first Larry Kallemeyn Award. The award is presented to individuals who have demonstrated "*outstanding professional achievement in scientific research or resource management in the Lake of the Woods and Rainy River Basins*".

A Curriculum Vitae outlining my education and professional experience is attached to this report.

2. Report Review

I have conducted a review of the Draft Environmental Report prepared by the Ojibway Power and Energy Group (OPEG) focusing on the issues of potential impacts to Lake Sturgeon. Based on this review, I have prepared this report. The report is based on my individual professional opinion and its contents should not be considered a position, opinion, or statement from the United States Geological Survey regarding this subject.

3. Findings

Hydrology/Bathymetry

In my opinion, the proposed project requires a review by an accredited professional hydrologist. Although this project is being proposed as a run of the river operation, it is unknown whether diverting the flows might cause changes in flow patterns through Little Eva Lake. Since Little

Eva Lake is definitely a major over-wintering area for lake sturgeon any such changes could be significant.

Based on available information, the proposed operational level for Bill Lake (352.3m) will inundate another 16.3 ha, thereby increasing the lake area by 12%. OPEG reports that this is within the normal flood level (1 in 2 years), however, the Environmental Report fails to consider that implications of the following change: instead of occurring only during flood periods this area will now be continuously inundated.

From the fisheries perspective, stable water levels are not necessarily always better since they can result in rock/rubble shorelines not getting cleared of fine sediments. In proposing the rule curve changes for Namakan Reservoir we actually recommended that they include a summer drawdown. These higher water levels will initially result in erosion and deposition of sediments from the existing shoreline.

Impacts on Little Eva Lake/High Falls area

As OPEG has indicated, the weir placed at the outlet of Bill Lake above High Falls will impede fish passage. This could be significant since the OMNR study has shown that 80% of the downstream movement of lake sturgeon from Bill Lake to Little Eva Lake is over High Falls. The extent of downstream movement by smaller sturgeon as well as other fish species is unknown. Also unknown is whether the fish will utilize the sluiceway that has been proposed and the amount of mortality that may result from the fish passing through the turbines.

OPEG acknowledges that “the rock removal at the outlet of Little Eva Lake will have the effect of permanently altering the shoreline and reducing the zone of fluctuation on Little Eva Lake by approximately 20 – 30 cm (1.87 m vs. 1.67 m post-construction).” They also recognize that the diversion of the flow from over High Falls to a discharge out of the tailrace will affect spawning habitat and general fish habitat at the base of High Falls. Although OPEG recognizes these effects, it does not provide any quantitative information on the possible magnitude of the effects and minimizes and/or fails to recognize the importance of these impacts.

Even though the project proponents have made the statement that there is no current plan to proceed with a development at Hay Rapids, many of the actions OPEG would be taking to implement the High Falls operation would also facilitate that additional development. Given the recognized importance of Hay Rapids to lake sturgeon, walleye, and other fish species, any development in that area has the potential to significantly affect the Namakan River and Reservoir’s fish community.

Impacts on Back Channel

According to OPEG’s analysis, flows through this area during the primary sturgeon spawning and migration periods commonly range from 10 to about 20 m³/sec 50% of the time. However, with the proposed weirs and diversion in operation only 4 m³/sec would be coming through the

Back Channel unless the river flows are at the 10 year flood level or higher. In my opinion, this will impose serious adverse impacts on the lake sturgeon population and habitat. Although the spawning habitat survey reported that lake sturgeon were present in the Back Channel in 2007 when flows were only 2.4 m³/sec, the OMNR study that tracked lake sturgeon found that the fish only moved through the Back Channel when flows were 8 m³/sec or more. This impediment to upstream migration in combination with the restrictions provided by the weirs and power plant operation to downstream migration has the potential to fragment the Namakan River and Reservoir's lake sturgeon population.

Other Concerns

The acreage of spawning habitat (3.073 ha) reported by the spawning habitat survey seems quite low given the complexity of the river and lake basins in the study area. Although the survey report does mention lake whitefish, there is no indication that their fall spawning activities were evaluated. Thus, it is impossible to determine what the impact of the proposed project would be on this species or any of the other fish species that may spawn in the area. Overall, the spawning survey did not provide the quantitative data needed to make a comprehensive and accurate assessment of the potential impacts of this hydro project.

The proposed construction schedule will undoubtedly have an effect on fish migration and spawning activity. The 2011 spring/summer spawning and migration activities will be effectively eliminated due to the scheduled construction of the cofferdams and control weirs. Of particular concern, is the apparent elimination of migration through the key Back Channel route given that it appears no water would be moving through it in 2011. The proposal to remove some of the rock constriction points during the winter when flows are lower could adversely affect the reproductive success of lake whitefish by releasing large quantities of sediments that could smother their eggs, which take several months to hatch.

Lack of Water Management and Mitigation Plans

Although water management and mitigation plans are referred to in this document, they are not actually included so it is impossible to evaluate them. The water management plan is needed to evaluate what will happen when the plant is actually operating. The mitigation plan is needed to explain what will be done to correct or minimize any adverse effects resulting from the operation. Without these two components it is not possible to complete an adequate assessment of the potential impacts of the project on fish population and habitat.

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Selected Publications

- Frohnauer, N. K., C. L. Pierce, and L. W. Kallemeyn. 2007. Population dynamics and angler exploitation of the unique muskellunge population in Shoepack Lake, Voyageurs National Park, Minnesota. *North American Journal of Fisheries Management* 27:63-76.
- Frohnauer, N. K., C. L. Pierce, and L. W. Kallemeyn. 2007. Simulated effects of recruitment variability, exploitation, and reduced habitat area on the muskellunge population in Shoepack Lake, Voyageurs National Park, Minnesota. *North American Journal of Fisheries Management* 27:77-88.
- Adams, W. E. Jr., L. W. Kallemeyn, and D. W. Willis. 2006. Lake sturgeon population characteristics in Rainy Lake, Minnesota and Ontario. *Journal of Applied Ichthyology* 22:97-102.
- Sorensen, J. A., Kallemeyn, L. W., and Sydor, M. 2005. Relationship between mercury accumulation in young-of-the-year yellow perch and water-level fluctuations. *Environmental Science and Technology* 39:9327-9243.
- Knights, B. C., Wiener, J. G., Sandheinrich, M. B., Jeremiason, J. D., Kallemeyn, L. W., Rolffhus, K. R., and Brigham, M. E. Ecosystem factors influencing bioaccumulation of mercury from atmospheric deposition in interior lakes of the Voyageurs National Park, Minnesota. USGS Final Report for Natural Resources Preservation Program (NRPP) Project Number 02-01, LaCrosse, WI.
- Christensen, V. G., Payne, G. A., and Kallemeyn, L. W. 2004. Effects of changes in reservoir operations on water quality and trophic-state indicators in Voyageurs National Park, northern Minnesota, 2001-03: U. S. Geological Survey Scientific Investigation Report 2004-5044, 42 p.
- Stott, W., Todd, T. N., and Kallemeyn, L. 2004. Genetic variability among lake whitefish from Isle Royale and the Upper Great Lakes. – *Ann. Zool. Fennici* 41:51-59.
- Kallemeyn, L. W., Holmberg, K. L., Perry, J. A., and Odde, B. Y. 2003. Aquatic synthesis for Voyageurs National Park. U. S. Geological Society, Information and Technology Report – 2003-0001, 95 p.
- Miller, L. M., Kallemeyn, L., and Senanan, W. 2001. Spawning-site and natal-site fidelity by northern pike in a large lake: mark-recapture and genetic evidence. *Transactions of the American Fisheries Society* 130:307-316.
- Kallemeyn, L. W. 2000. A comparison of fish communities from 32 inland lakes in Isle Royale National Park, 1929 and 1995-97. U. S. Geological Survey, Biological Resources Division Biological Science Report USGS/BRD/BSR2000-0004. Columbia Environmental Research Center, Columbia, Missouri. 65 pp + Appendixes A-D.
- Schlosser, I. J., and Kallemeyn, L. W. 2000. Spatial variation in fish assemblages across a beaver-influenced successional landscape. *Ecology* 81:1371-1382.
- Soupir, C. A., Brown, M. L., and Kallemeyn, L. W. 2000. Trophic ecology of largemouth bass and northern pike in allopatric and sympatric assemblages in northern boreal lakes. *Canadian Journal of Zoology* 78:1759-1766.
- Kallemeyn, L. W., Cohen, Y., and Radomski, P. 1993. Rehabilitation of the aquatic ecosystem of Rainy Lake and Namakan Reservoir by restoration of a more natural hydrologic regime. Pages 432-448 in L. Hesse, C. B. Stalnaker, N. G. Benson, and J. R. Zuboy, editors. Biological Report 19 of the proceedings of the symposium on restoration planning for the rivers of the Mississippi River ecosystem. U. S. Department of the Interior, National Biological Survey, Washington, DC.