Keeyask Generation Project Aquatic Mitigation and Offsetting - Planning to Construction

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This paper provides an overview of the aquatic mitigation and offsetting program developed and implemented as part of the Keeyask Generation Project. The paper details the evolution of mitigation and offsetting measures from the early planning stages of the project through to their construction and implementation. The Keeyask aquatic mitigation and offsetting program has spanned several decades of planning and design and has now nearly completed construction. It is hoped that sharing key aspects of the program, lessons learned, how designs/concepts evolved, and plans to monitor and adapt moving forward will be helpful to other practitioners developing similar measures. The Keeyask Project is a 695-megawatt hydroelectric generating station being developed as a partnership between Manitoba Hydro and 4 Manitoba First Nations: Tataskweyak Cree Nation, War Lake First Nation, York Factory First Nation, and Fox Lake Cree Nation. Working together, the Partners are known collectively as the Keeyask Hydropower Limited Partnership. Located approximately 725 km north of Winnipeg, Manitoba, Canada on the lower Nelson River, construction of the Keeyask Project includes a powerhouse, spillway, more than 2 km of dams, and 23 km of dikes. Major construction of the generating station commenced in July 2014 and as of January 2022, 6 of the 7 generating units have entered service. Fish species identified as valued environmental components for the project included Walleye, Lake Whitefish, and Northern Pike Lake Sturgeon. These species were identified as needing specific mitigation and offsetting measures to account for project associated effects. The aquatic mitigation and offsetting program developed for the Keeyask Project followed a hierarchy of environmental protection approach striving first to avoid impacts where possible and adapt the project to remove or reduce impact. Mitigation measures were then used to further remove or reduce the impacts. Finally residual impacts were addressed using offsetting measures designed to balance out remaining project impacts. Mitigation measures incorporated into the project to reduce of remove impact on the aquatic environment include fish friendly turbine designs, winterkill mitigation within the reservoir, and the modification of the spillway channel to avoid fish stranding. Offsetting measures designed to balance the residual aquatic environmental impact include the construction of spawning habitat within the reservoir, construction of spawning habitat downstream of the generating station, and a Lake Sturgeon Stocking program.The design of these measures spanned over several decades evolving from early concepts to constructed measures. Several of the measures were modified over this process from their original concept due to changes in best practices, the availability of additional design inputs, or changes to other key project components. The project is also committed to monitoring, adapting, and enhancing these measures as required in order to meet the commitments outlined in the projects aquatic protection plan.