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**English title:** Rivière-des-Prairies Generating Station – Monitoring of the downstream migration of American shad and testing of a sound barrier– 2007

**Abstract:**

The Rivière-des-Prairies Power Dam comprises a run-of-river generating station, including six turbines, and an adjacent spillway, with 13 vertical gates. Since 2002, the effect of periodic shutdowns of the generating station and discharges through the spillway, for a period of about an hour, on the downstream migration of adult American shad (*Alosa sapidissima*) is assessed. Cumulated results over the years clearly showed that one hour shutdowns of the Power Dam are efficient to provide safe passage at the spillway to shads accumulated in the forebay. The 2007 study mainly aimed at assessing a sound barrier on shad behavior. The acoustic echoes from one scanning sonar were used to calculate an abundance index for shad in front of the generating station. The ultrasonic barrier, made up of seven pairs of transducers operating with 125 and 200 KHz, was installed along the gallery upstream of the power station. Short preliminary tests, carried out in 2006, showed that it was opportune to evaluate the dissuasive effect of such a device on the adult American shad.

Three scanning sonars were used to estimate the abundance of shads in front of the power station and to provide an index of abundance. The barrier was initially operated with the two frequencies in alternation for a 30 minutes period each. One observed a major reduction in the indices of abundance of shads in the minutes which follow the beginning of the emission of sound frequencies followed by a sharp rise of these indices as of the interruption of the transducers. The repulsive effect is immediate and considerable.

The observations in 2007 also suggest that the American shad has a higher sensitivity to the 125 KHz frequency, when the two frequencies, 125 KHz and 200 KHz, are used. The results show that the use of a barrier at single frequency of 125 KHz to repulse the shads from the power station is a very effective device. However, as there were less fish in front of the power station in 2007 because the latter operated with only three turbine-alternator groups out of six, the effectiveness could be less when it operates with full mode and that the shads are present in larger number.

**Keywords:** American Shad, *Alosa sapidissima*, Power station shutdowns, Downstream migration, Rivière-des-Prairies Power Dam, des Prairies River

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