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English title: Monitoring of eel ladders at Beauharnois Power Dam and the Chambly Dam - 2007

Abstract :***Eel ladders at the Beauharnois Power Dam***

Two eel ladders are in place at the Beauharnois Power Dam, one at each end. They started operating in 2002 on the West side and 2004 on the East side. Previously, starting in 1994, eels were captured and transferred manually in the forebay. In 2007, it is estimated that 52 969 eels crossed the West ladder, the highest number recorded since 1994. The total eel counts of 2005 (51 694), 2006 (50 389) and 2007 shows values exceeding 50 000 eels annually. The number of passages in 2007 is 1,2 times higher than in 2004 (42 635), 1,6 times higher than in 2003 (32 684) and 5 times higher than in 2002 (10 503). More than half of the eels which ascended the West ladder in 2007 made it in August (53,1% of the total).

The photoelectric eel counter installed at the exit of the West ladder has an average error rate of 6,5% for the thirteen days when a manual count made it possible to validate the electronic counts. An overall error rate of 4,5% is obtained when comparing the total electronic (7 228) and manual (7 566) counts for these days.

In 2007, on the West side, the average eel size of a sample (N =3 089) is 360,6 mm (S=71,4), significantly higher than in 2004 (350,8 mm), 2005 (344,3 mm) and 2006 (349,0 mm). Eels were larger from 1994 to 2002, with average size exceeding 420 mm, than from 2003 to 2007, when size was smaller than 366 mm.

In 2007, only one eel crossed the East ladder, in the night of October 13 to 14, even if it had been operating for 95 days. There is currently no explanation for the high annual variations in the number of eels in the tailrace of power station 1.

Eel ladder at the Chambly Dam

Since 1997, an eel ladder is in place on the left side of the Chambly Dam, on the Richelieu River. In 2007, during 111 days of operation, 1 340 eels ascended it. The passages are more numerous in July (62,6% of the total number), with a short peak period on July 26 and 27. The year 2007 is the 5th in terms of number of passages, behind 1998, 1999, 2003 and 2005.

The average size of eels at Chambly in 2007 (327,4 mm) is similar to 2005 (324,8 mm) whereas it is much smaller than in 1997 (379,7 mm), 1998 (386,3 mm) and 2006 (383,3 mm). A strong correlation ($R^2 = 0,8561$) is observed between the discharge of the Richelieu River and the average size of eels. It seems that a strong flow would have a selective effect on the small eels, which would have difficulty to find the entrance of the eel ladder in presence of strong turbulences.

Keywords: Eel, *Anguilla rostrata*, Upstream migration, Eel ladder, Fishway, Chambly Dam, Beauharnois Power Dam, Upper St. Lawrence River, Richelieu River

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