

SUMMARY

During the fall of 1996, Hydro-Québec increased the surface area of an existing spawning ground located downstream of the Rivière-des-Prairies Power Dam. The new section was created with excavated material from a new man-made canal. This report synthesizes studies realized between 1995 and 1999 to determine the impact of this new section on lake sturgeon's (*Acipenser fulvescens*) reproduction. The mandate included three objectives. The first one consisted in synthesizing data from five annual reports on lake sturgeon use of the site for spawning activities, larval drift and reproductive success. The second objective was to analyze data not presented in annual studies (spawners residence time on the site, reproduction periodicity, etc.). Our third objective consisted in integrating these results in a more general scope (recommendations on this type of enhancement measure and monitoring of other spawning grounds, etc.).

In 1995, 1998 and mainly 1999, spring water flows were particularly low and water temperature increased rapidly. The opposite situation was observed in 1996 and 1997. Spawning was early in 1998 and 1999 (peak reached in early May), in comparison to 1995, 1996 and 1997 (peak from mid through the end of May). Adults captured with gillnets and eggs collected on artificial substrates often presented a bimodal pattern, the first mode being greater than the second. During the springs characterized by a low hydraulicity, spawner numbers and/or spawning activities was low for the southern portion of the river. The sampling station located on the new spawning section was among the mostly used for egg deposition in 1996 and 1999 even under low hydraulic conditions. The use of areas situated very close to the canal suggests that it has no negative impact on spawning. Estimation of spawner numbers on the site by capture-recapture varied between 9657 individuals, including 1135 females in 1996, and 4163 individuals, 500 of which were females, in 1999. Even if hydrologic conditions could explain such a low female abundance, this drastic decline raises concerns. The spawners' residence time on the spawning ground ranged from 4 to 8 days. The reproductive periodicity of males is likely 2 years. Average annual growth is 1,28 cm for specimens recaptured after one year interval, 2,29 cm after two years and 2,82 cm after three years. From 1994 to 1999, lake sturgeon's larval drift varied from 14 to a 40 days. Larval drift peaks occurred between May 21st and June 12th. Absolute abundance of larvae drifting from the spawning site varied between 1.2 million (1996) and 8.6 millions (1994). Mean survival rate between the estimated number of laid eggs and drifting larvae was 0,8% in 1995 and 1996, before the construction of the new spawning section, comparatively to 5,44% in 1997, 3,65% in 1998 and 2,41% in 1999. Even if two major factors (hydrologic conditions during spawning activities and egg densities on the spawning site) could have simultaneously affected reproductive success, results from 1997 to 1999 indicate that the new section of the spawning ground had a positive impact on the reproductive success of lake sturgeon in the Des Prairies River. When issues like egg overdensity or poor substrate quality are identified, this type of enhancement measure could be used to increase the reproductive success for this species.

The information gathered during this study allowed to refine previous recommendations by La Haye and Fortin (1990) and by Khoroshko and Vlasenko (1970) for the management of sturgeon spawning grounds, particularly concerning the decision process to create such habitat, its location relative to the water flow and depth, as well as other physical parameters (surface area and substrate).

Fortin, R., J. D'Amours et S. Thibodeau. 2002. Effets de l'aménagement d'un nouveau secteur de frayère sur l'utilisation du milieu en période de fraie et le succès de reproduction de l'esturgeon jaune (*Acipenser fulvescens*) à la frayère de la rivière des Prairies. Rapport-synthèse. Pour Hydro-Québec et la Société de la faune du Québec. Département des Sciences biologiques, Université du Québec à Montréal. 116 p., annexes.