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Abstract :

Between 1992 and 1999, Hydro-Québec refurbished La Gabelle Power Dam on the Saint-Maurice River. In August 1999, a new spawning area for lake sturgeon (*Acipenser fulvescens*) was created downstream from the dam to compensate for an encroachment on fish habitat. Sampling done in Spring 2000 under high runoff conditions showed that the new spawning ground had been highly used by lake sturgeon. The objectives of the present study were to check the use made by lake sturgeon and other fish species of the new spawning ground and the existing shoal under low runoff conditions.

The average total flow between May 5 and 23, 2001 (807 m³/s) was much lower than the average total flow calculated over 20 years (1977-1996 ; 1426 m³/s) for the same period of the year, which is representative of low spring runoff.

Fish egg sampling was carried out between May 9 and 24, 2001, by means of driftnets and artificial substrates installed on the river bed. The back-calculation of spawning dates revealed that lake sturgeon mainly spawned between May 13 and 19. The peak of spawning occurred about one week earlier in 2001 than in 2000. The average water temperature at the start of the spawning peak was 10 °C in 2000 (max. 10.8 °C) compared with 12 °C in 2001. Egg collection with the driftnets and artificial substrates was higher on the existing shoal than on the new spawning ground, but the differences were not statistically significant. On the new spawning ground, the total number of lake sturgeon eggs and the maximum daily CPUE_{artificial substrates} was lower in 2001 than in 2000. It is presumed that the reduction in water velocity on the shoal resulted in an increase of the surface area of spawning ground available and in a decrease in egg densities.

Gillnetting on May 9 and 14 caught, overall, 377 longnose sucker (*Catostomus catostomus*), 1 white sucker (*Catostomus commersoni*), 1 walleye (*Stizostedion vitreum*) and 2 northern pike (*Esox lucius*). Eggs of sucker (*Catostomus* sp.), mooneye (*Hiodon tergisus*) and two other unidentified fish species were also collected with the sampling devices used. Excluding lake sturgeon, the longnose sucker is by far the species that uses new spawning ground the most. The CPUE_{driftnets} of Catostomidae on the new spawning ground was higher on average than on the existing shoal, but this difference was not statistically significant. By adding the species exhibiting a spawning behavior in the spring of 2000 (walleye, smallmouth bass and rock bass), this brings the number of species using the new spawning ground to eight.

The results of the present study showed that, under low spring flow conditions, lake sturgeon use the existing shoal as much as the new spawning ground. When considering the results of the study carried out in the spring of 2000 (high runoff), we can conclude that the new spawning ground is used by lake sturgeon under a wide range of spring runoff conditions. The intensity of use of the new spawning ground seems related to river flow, since it increases as a function of runoff. Other fish species use the new spawning ground to various degrees.

Key words : La Gabelle, power dam, spawning, fish, sturgeon, *Acipenser*.

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