

EASTMAIN-SARCELLE-RUPERT COMPLEX

*What We Have Learned
 About Fish Communities
 in the Rupert Diversion Bays*



Fish monitoring plan

Monitoring the changes in fish communities in the two diversion bays is part of the Environmental Monitoring Program for the Eastmain-Sarcelle-Rupert complex. Information on fish populations was collected prior to the diversion, in 2002 and 2008, and after the diversion, in 2011 and 2014. Monitoring will continue in 2016 and again in 2018 and 2021.

To offset the loss of spawning habitat after diversion bays impoundment, two lake sturgeon spawning grounds were developed in the upper portion of Rupert forebay. Eight spawning areas were also developed for lake trout near the natural spawning grounds found in three former lakes in the forebay. The man-made spawning grounds have been monitored since 2010 to ensure that they are still in good condition and usable by fish for spawning. This monitoring will continue at regular intervals until 2023.

To document the presence and movement of lake sturgeon and lake trout after impoundment, 50 sturgeon and 40 lake trout were tagged in 2009 prior to impoundment. The movements of these fish were then monitored using telemetry. Telemetric monitoring ended in the summer of 2014.

Fish communities – 2014 results

As in 2011, fishing consisted of gill-net sampling at 17 stations, including 9 in the forebay, 5 in the tailbay and 3 in the control lakes. Each station was sampled twice, in July and August 2014. These stations are located on traplines belonging to the communities of Mistissini and Nemaska.

Twelve different fish species were caught in the Rupert diversion bays and control lakes. The number of fish caught per net (average of 13 fish per net) was the same in both diversion bays. In both bays, walleye was the most abundant species. Northern pike, white sucker and lake whitefish were the other species most frequently caught. As for the species composition of the fish communities, few changes have been observed since impoundment. Most of the species present before impoundment have also been recorded after impoundment.

Table 1

Fishing yield (CPUE) for the main species in the Rupert diversion bays in 2014

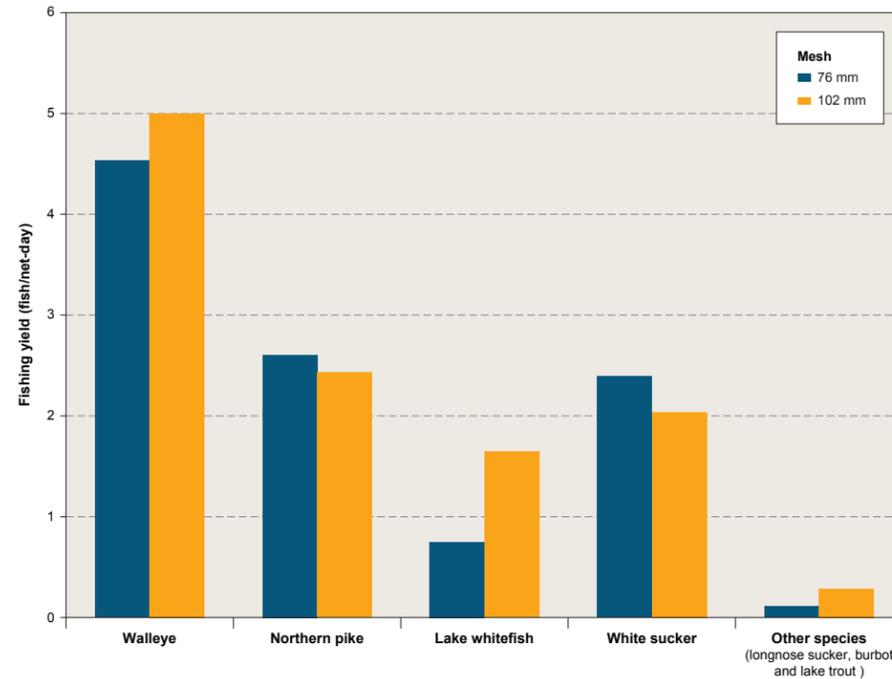


Table 2

Average fish length for the main species in the Rupert diversion bays in 2014

Type of gill net	Average length		
	Walleye	Northern pike	Lake whitefish
76-mm (3-inch) mesh	48 cm (19 in.)	66 cm (26 in.)	44 cm (17 in.)
102-mm (4-inch) mesh	49 cm (19 in.)	69 cm (27 in.)	46 cm (18 in.)

Walleye

Before and after impoundment, walleye accounted for about 40% of the catch in the Rupert diversion bays. In 2014, the fishing yield (CPUE) for this species in both diversion bays was lower than before diversion. A similar decline was observed in the control lakes in 2014, so it may be unrelated to diversion bay impoundment. The small walleye caught indicate that this species is not having difficulty reproducing in the new environment. Walleye is generally the dominant species in lakes in the region.

Lake sturgeon

No lake sturgeon were caught in the nets even though monitoring confirmed that the species still inhabits the forebay. Based on the information collected during telemetric monitoring, we know that nearly 80% of the tagged sturgeon left the tailbay during the first year after impoundment. Half of them cannot return because they left through Rupert spillway. The others moved upstream on the Rupert and could eventually come back.

Northern pike

In 2011 and 2014, northern pike were found at all the stations sampled. Relative abundance and fishing yield increased in the diversion bays after impoundment. Reproductive success for northern pike has therefore risen substantially since the first year following impoundment.

Lake whitefish

In the forebay, the lake whitefish population was found to be similar before and after impoundment. However, in the tailbay, the proportion of whitefish caught in 2014 was the lowest recorded in four years of sampling. The large number of small specimens (< 250 mm long) in both diversion bays in 2011 and 2014 confirms successful reproduction in the species, as numbers in this size class increased in the first year after impoundment and have remained high ever since.

Lake trout

Station RP062 (Map 1) is the only place where lake trout were caught during the 2011 and 2014 follow-ups on fish communities. This is also the area where most specimens were caught in 2002 and 2008. Lake trout abundance will probably remain low in the future. Note that, prior to impoundment, lake trout was a species confined to a few water bodies in the Rupert diversion bays area. Telemetric monitoring of lake trout showed that, unlike sturgeon, few trout left the diversion bays via Rupert dam but use Lac Mesgouez upstream from the diversion bays. Lake trout populations in most lakes in the region are generally fairly small and tend to be concentrated in specific parts of the lakes.

What to remember

- Developed spawning grounds for sturgeon and lake trout have not been damaged by ice and currents and can still be used by the species. However, no eggs have been found in them so far.
- Many lake sturgeon left the forebay via Rupert dam, with those remaining spawning in the spawning grounds at KP 362 (Lac Mesgouez). Since 2012, there has been no movement by the species outside the diversion bays and the environment appears to be suitable for the species.
- Lake trout appear to have used Lac Mesgouez a great deal because a lot of travel was observed between this lake and the forebay. Lake trout still use some natural spawning grounds identified before diversion bay impoundment.
- The number of young walleye, northern pike and whitefish caught in the forebay suggests that these species have had no difficulty reproducing since impoundment.
- These environmental monitoring activities, conducted in close cooperation with the Cree partners, have produced a wealth of information on changes in fish populations in the Rupert diversion bays that will be useful in the future. Since 2007, over 80 environmental monitoring activities have been carried out under the Environmental Monitoring Program for the Eastmain-Sarcelle-Rupert complex; these activities are slated to continue until 2023.



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MAP 1 - Fishing yield and species composition at the stations sampled in 2014

