

St. Lawrence River Discussion Paper

FISH COMMUNITIES AND FISHERIES OF LAKE ST. LAWRENCE

Issues

Below is a synopsis of fish community issues and proposed management approaches. More detailed background information is provided in the main-body of the document. Please consider whether you support the proposed approaches.

Bass populations and the associated sport fishery have been improving in Lake St. Lawrence. Pike populations are low, but have begun to increase in recent years. Pike is not as popular as other sport fish in the Lake St. Lawrence area.

Ontario Ministry of Natural Resources (OMNR) and the New York State Department of Environmental Conservation (NYSDEC) are considering a reduction in harvest of bass and pike in other areas of the St. Lawrence River, by implementing new size limits or creel limits.

- ***OMNR and NYSDEC would like to know if the public would support similar limits in the Lake St. Lawrence area to conserve and possibly improve the bass and pike fisheries.***

Recent studies show that walleye appear to be increasing, and the fishery is improving. Yellow perch have been and continue to be a very common species throughout the river. Yellow perch populations in the Lake St. Lawrence area declined between 1985 and 1990, but since that time have remained relatively stable.

- ***OMNR and NYSDEC think the yellow perch and walleye populations are currently favourable for anglers and plan on continuing current management practices and regulations.***

Several differences exist between New York and Ontario fishing regulations. These include differences in open seasons and the presence or absence of minimum size limits. For example, a

minimum size limit of 12 inches (305 mm) applies to bass only in New York waters of the St. Lawrence River.

- ***OMNR and NYSDEC would like to know if the public would like to see the same regulations in both Ontario and New York waters of the St. Lawrence River.***

An increase in the minimum size limit for muskellunge is being proposed for Ontario waters of the St. Lawrence River in an effort to promote a record-class fishery.

- ***OMNR and NYSDEC would like public comment on the proposal to change muskellunge size limits.***

New York anglers are permitted to sell any hook and line-caught panfish that are not protected by minimum length and possession limits and come from New York waters of the St. Lawrence River. NYSDEC would like to know if the public would like to see this fishery maintained.

- ***NYSDEC would like to know if the public supports the continuation of this practice***

OMNR and NYSDEC are actively involved in programs that focus on uncommon or unique fish species that are not sport fish, such as rare small fish, lake sturgeon, and American eels.

- ***OMNR and NYSDEC would like to know the level of public support for management of such non-sport fish species.***

Background Information

Fish Community

The fish community of Lake St. Lawrence is extremely diverse. Historic reports indicate there are over 85 fish species in the St. Lawrence River. Almost 60 fish species have been recorded in New York and Ontario waters of Lake St. Lawrence over a 40-year period. These include bait/forage fish, and larger sport and non-sport fish species fish species.

Notable Changes in Major Sport Fish Populations

The major sport fish species for Lake St. Lawrence are walleye, smallmouth bass, yellow perch northern pike, and muskellunge.

New York State Department of Environmental Conservation has carried out an annual index-netting program in Lake St. Lawrence since 1983 to assess relative abundance and distribution of certain fish species. Ontario fisheries managers have conducted angler surveys to gather information about angler catch, harvest and effort.

Yellow Perch

Yellow perch is a very common species throughout the St. Lawrence River. It is not only an important component of the Lake St. Lawrence recreational fishery but is also of significant value to the commercial fishery in other parts of the river. Perch has been the most abundant species caught throughout all assessment years. Between 1985 and 1990, yellow perch abundance went through a noticeable decline. Since that time it has remained relatively stable (Figure 1).

Total length of perch for catches from 1992 to the present has remained similar, ranging anywhere from 130 to 230 mm (5.1 to 9.1 inches). The age of fish caught throughout the assessment program has also remained similar through the years (between 2 and 5 years old).

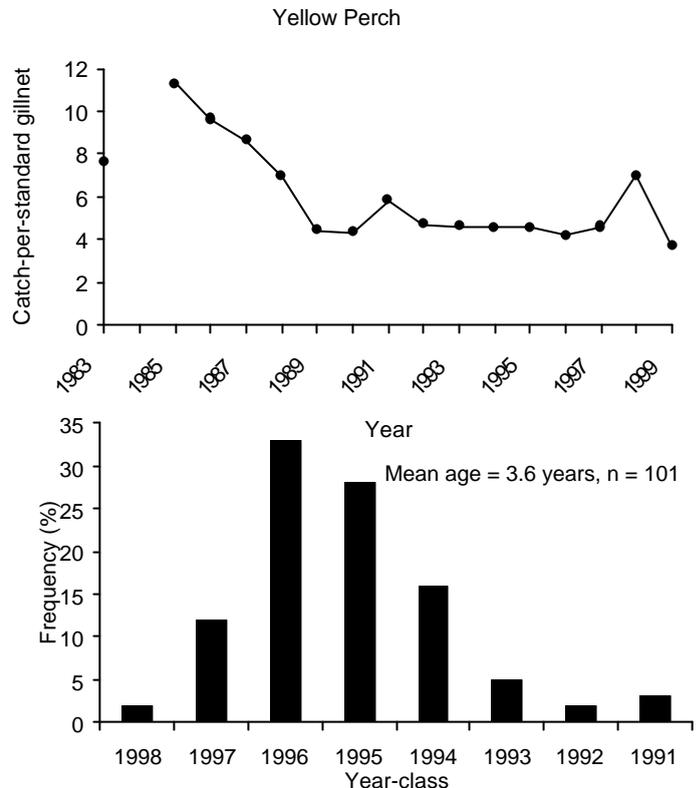


Figure 1. Upper panel shows yellow perch catch in standard gillnets set in Lake St. Lawrence area, 1983 to 1999. Lower panel shows age distribution of yellow perch caught during 1999. * no data available for 1984 gillnetting program

Angler harvests in 1995 showed a similar range in ages. There was a slight shift from larger to smaller fish between 1988 and 1995. However, sizes of fish were not unlike those harvested during a 1986 angler survey.

The angler survey in 1995 showed that yellow perch are predominantly harvested in the pre-bass season. Angler catches and harvests of perch showed a decline between 1988 and 1995. Overall angler effort directed at catching yellow perch also declined. There appears to be a shift in effort and harvest from yellow perch to walleye in Lake St. Lawrence.

Walleye

Walleye have become the most sought-after game fish in Lake St. Lawrence. In 1988, smallmouth bass and yellow perch were targeted more than walleye. The walleye fishery is becoming more significant during the pre-bass season and during the fall. In

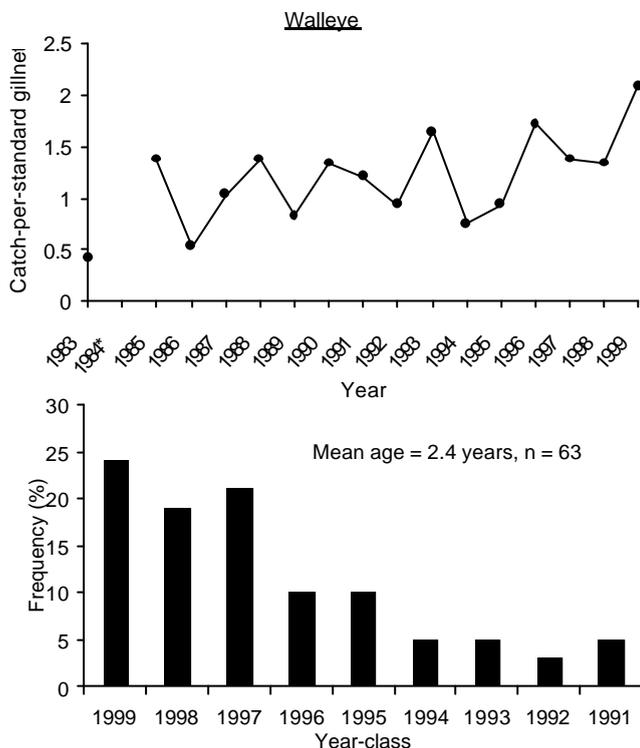


Figure 2. Upper panel shows walleye catch in standard gillnets set in Lake St. Lawrence area, 1983 to 1999. Lower panel shows age distribution of walleye caught during 1999. * no data available for 1984 gillnetting program

1988 anglers fished for walleye most frequently during the summer months. Anglers nearly doubled their fishing effort for walleye between 1988 and 1995. Angler-harvest of walleye in 1995 more than doubled that of 1988.

Walleye abundance in Lake St. Lawrence has shown an impressive increase since 1983. Habitat rehabilitative efforts (Hoople Creek, Ontario), fish culture and stocking of St. Lawrence River walleye (New York), and improvements in water quality may be contributing to this trend. Walleye was the third most abundant fish species, after yellow perch and rock bass, caught during the 1997 fall netting program. Walleye made up 10.1% of the total catch in 1999.

During 1983, 0.42 walleye per net-night were caught. Between 1983 and 1990 their numbers remained relatively stable (Figure 2). In 1991 they began to increase. Abundance reached a record high in 1999 (2.09 fish per net-night).

The majority of walleye netted during the 1990s have been less than 550 mm (21.7 inches) in total length with very few fish older than 5 years of age. Young-of-the-year and yearling fish dominated catches during 1998 and 1999, suggesting excellent spawning conditions during recent years. Angler survey information (1995) shows walleye of similar age and size ranges are being harvested. The lengths of walleyes harvested during the 1995 Ontario angler survey were smaller fish, ranging from 450 to 550 mm (17.7 to 21.7 inches) long. The majority of walleye harvested in the 1995 were between 2 and 3 years of age.

Angler creels (harvests) of walleye from Ontario waters in 1986 and 1988 were predominantly fish with a total length of 450 mm (17.7 inches) and an average age of 5.5 years. These fish were slightly smaller than the minimum size limit of 18 inches (457 mm) that is imposed in New York waters.

Smallmouth Bass

The smallmouth bass recreational fishery in Lake St. Lawrence is now second in importance after walleye. In 1988, bass were the most targeted species. In 1995, 35% of angler effort was directed at smallmouth bass. While angler effort remained about the same between 1988 and 1995, harvests of smallmouth bass increased one and one half times in 1995.

In 1988 Lake St. Lawrence anglers harvested bass during the summer months. In 1995, effort was directed toward bass during the pre-bass season as well as summer and fall. Interestingly, harvest rates for smallmouth bass in 1995 were the highest during the pre-bass season. Not unexpectedly, catch rates were also higher during the pre-bass season. This is because male bass are more vulnerable while they guard nests or newly hatched fry.

Research has shown that removing guarding males for even a short period of time can expose eggs and newly hatched fry to predation. Hook-wounded bass that are captured and immediately released will often abandon their nest. These incidents can contribute to reduced numbers of bass in future years, particularly

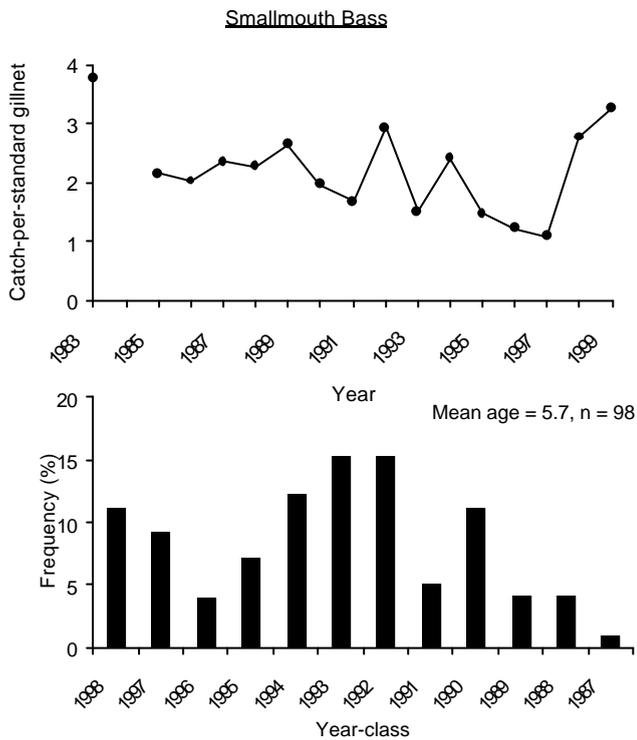


Figure 3. Upper panel shows smallmouth bass catch in standard gillnets set in Lake St. Lawrence area, 1983 to 1999. Lower panel shows age distribution of smallmouth bass caught during 1999. * no data available for 1984 gillnetting program

during years when spawning conditions are less than optimal.

There is concentrated enforcement effort to protect bass during this critical period. Unfortunately some offences still go undetected.

The range in lengths and ages of the 1995 anglers' creel (harvest) from Ontario waters was similar to previous creels in 1986 and 1988. The majority of smallmouth bass were between 270 and 400 mm (10.6 and 15.7 in) and between 5 and 8 years of age. The average total length of bass was 310 mm (12.2 inches).

Smallmouth bass was the second most abundant species caught during the 1999-assessment program making up 18.3% of the total catch. Overall, smallmouth bass abundance in Lake St. Lawrence decreased between 1983 and 1997 but has increased since (Figure 3). Unlike bass in the Thousand Islands-Middle Corridor, bass caught during the

1996 and 1997 Lake St. Lawrence netting program are larger and represent a wide range of ages.

In 1997, the total length of the majority of the smallmouth bass catch was between 320 and 440 mm (12.5 and 17.3 in). The mean age of the catch was 5.9 years.

Northern Pike

Warmwater assessments show that Lake St. Lawrence has a typically low population of northern pike compared to other sections of the river. This is not to say that the Lake St. Lawrence population of pike is necessarily in trouble. Limited, quality nursery and spawning habitats are very likely the factors that limit reproductive success and recruitment to the adult population.

Optimal northern pike spawning substrate is flooded vegetation, preferably hummocks of grasses and sedges. Water is generally 20 to 45 cm (7.9 to 17.7 inches) deep. This type of habitat is very limited in the nearshore areas of Lake St. Lawrence because of daily and seasonal water level fluctuations.

Developing eggs are sensitive to low oxygen levels, high siltation rates and drops in water levels of as little as 0.2 m (8.4 in). Fry also are highly vulnerable to water level fluctuations for the first 6 to 10 days of life.

Abundance of northern pike appears to be increasing after an historic low reached in 1996 (Figure 4). In 1997, five of 11 pike caught were age-3. The majority of the assessment catch ranged between 450 to 650 mm (17.7 to 25.6 inches) in total length.

During a 1995 angler survey in Ontario waters, anglers harvested northern pike primarily during the pre-bass season and in the summer. Sample sizes during the survey were too small to accurately estimate total length ranges and mean age of the catch. Most Lake St. Lawrence anglers prefer walleye, smallmouth bass and yellow perch.

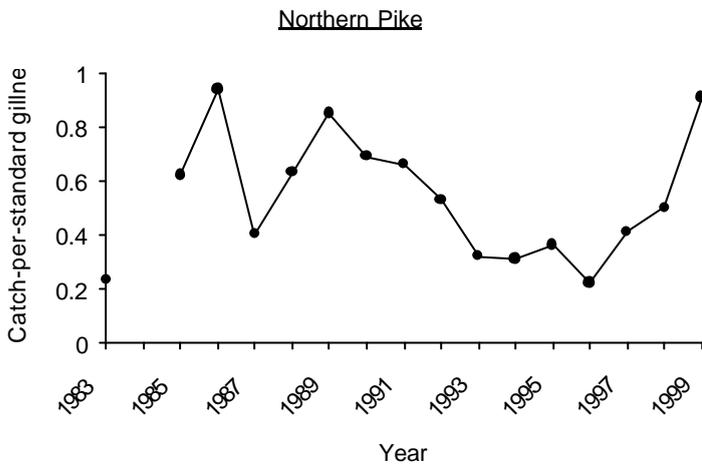


Figure 4. Shows northern pike catch in standard gillnets set in Lake St. Lawrence area, 1983 to 1999. A small sample size (11 fish) does not allow accurate description of northern pike age distribution.
* no data available for 1984 gillnetting program

A variety of environmental and physical factors can influence northern pike development from egg to adult stages.

- 1) Spawning success is linked to high water levels and flooding at time of spawning and stable water levels during the incubation period.
- 2) Developing eggs are sensitive to heavy siltation. Siltation can be increased by localized disturbances to shorelines or unstable shorelines that are subjected to heavy wave action or currents.
- 3) Under optimal conditions, pike grow at a very rapid rate during their first year of life. Young-of-the-year northern pike grow best in temperatures between 22-23°C. Future studies may show an increase in abundance and size of pike produced in 1998 and possibly 1999 because of the warmer temperatures we experienced earlier in the spring compared to the cooler spring temperatures experienced in 1992-1994.
- 4) Juvenile and adult fish prefer and grow best at water temperatures around 19°C. With increasing water temperatures, juvenile and adult pike are likely to move out of their traditional feeding areas and move to deeper water. Warmer temperatures tend to reduce growth rates in older pike.

Muskellunge

Muskellunge are large, second in size only to the lake sturgeon. They are sensitive to physical habitat changes and poor water quality conditions.

Studies conducted river-wide suggest that muskellunge stocks have declined since the 1950s. Minimum size and catch and possession limits combined with habitat protection laws are used to manage muskellunge on the river. The promotion and growing popularity of catch and release fishing contribute to management efforts aimed toward maintaining a high quality fishery based on natural reproduction.

There are only a small number of waters that have the growth potential to produce record-class sizes of muskellunge. The St. Lawrence River is one of these water bodies. As such, an increase in the muskellunge minimum size limit from 112 cm (44 inches) to 137 cm (54 inches) is being proposed for Ontario waters of the St. Lawrence River in an effort to promote a record-class fishery.

Other important fish species

Lake sturgeon is the largest of the freshwater fishes. They are extremely sensitive to physical habitat changes and poor water quality conditions. Sturgeon were historically important to the commercial fishing industry.

A history of overfishing, habitat loss and degradation and blocked migration routes resulted in a serious decline of lake sturgeon populations throughout the river. Sturgeon are no longer harvested commercially and no recreational harvest is permitted for this species in either New York or Ontario waters for the entire river. Based on results from a variety of survey techniques used between 1983 and 1997, a number of sturgeon remain in Lake St. Lawrence and the Middle Corridor sections of the river.

Over 30,000 sturgeon fingerlings have been stocked in the main part of the river and tributaries of the

Middle Corridor and Lake St. Lawrence since 1993. Efforts also have been made to restore lake sturgeon spawning habitat in New York waters. Sturgeon have been observed spawning on an artificial reef near Ogdensburg since 1994. Another spawning enhancement project completed in the fall of 1996 below the Madrid Dam on the Grasse River looks promising.

American eels

American eel numbers have shown a dramatic decline throughout its range. Harvest pressures, changes in ocean currents, blockage of migratory routes by dams, and habitat losses have been identified as the possible causes of these declines. Identification of the factor or factors that are causing the eel's decline is difficult because of the scientific uncertainty, the complexity of the eel's life cycle, and the broad range of the eel population. As a result, even though the current decline in the St. Lawrence River / Lake Ontario eel population is quite clear, it is not clear that local management actions would lead to an increase in the numbers of eel in the future.

OMNR and NYSDEC are working with other management agencies, including Faune et Parcs Québec and the New York Department of Environmental Conservation, to evaluate options for eel management on a global scale.

Rare fish species

The St. Lawrence River is home to a number of rare fish including channel darter, mooneye, pugnose shiner, blackchin shiner and bridle shiner. Although these species do not provide sport or commercial values, they do add to the diversity of the aquatic ecosystem, and could be basis of larger populations should the ecosystem become more favourable to these species.

Economic Values

Commercial Fishery

While no commercial net fishery exists in New York waters of the St. Lawrence River, commercial sale of hook-and-line-caught fish (primarily yellow perch)

occurs. The magnitude of this commercial fishery is unknown, and is currently unregulated for those species that are not protected by minimum length and possession limits (primarily panfish). No commercial net fishery currently exists in Ontario waters of Lake St. Lawrence.

Recreational Fishery

Recreational fishing on the St. Lawrence River is an important component of local economies in both New York state and Ontario, each representing a multimillion-dollar value. While New York and Ontario expenditure estimates can not be directly compared, the following examples provide some idea of the overall value of the St. Lawrence River fishery. Anglers fishing New York waters spent an estimated \$30.7 million (US) locally in 1996. Ontario estimated that 1995 expenditures directly allocated to angling in Ontario waters of the St. Lawrence River was \$11.6 million (CAN).

Angler effort in New York waters of the river increased between 1973 and 1996. The Ontario study also reports an increase in angler effort for Ontario waters between 1990 and 1995. In comparison, angling effort throughout the entire Great Lakes system showed an overall decline from previous years. In 1996, 78,240 anglers spent an estimated 923,230 days in New York waters fishing primarily for bass and northern pike. Walleye and yellow perch were also targeted but not to the extent of bass or pike. In 1995, 30,810 anglers spent an estimated 484,845 days fishing in Ontario waters.

Lake St. Lawrence angler surveys conducted in Ontario waters during 1988 and 1995 showed that anglers fish primarily for walleye and smallmouth bass. Yellow perch and northern pike are of secondary importance.

Total angling effort in Lake St. Lawrence showed no significant change between 1985 and 1995. Bass were the most preferred species in 1988. In 1995 anglers fished more for walleye than smallmouth bass. Angler effort almost doubled for walleye and northern pike between 1988 and 1995. Anglers

spent slightly less time angling for smallmouth bass and yellow perch.

A greater number of walleye, smallmouth bass and northern pike were harvested in 1995 compared to 1988. Yellow perch harvest decreased between 1988 and 1995.

1999 Fishing Regulations

A comparison of the New York and Ontario recreational fishing regulations shows differences in open seasons for northern pike and bass on the St. Lawrence River. Several other differences apply to either salmon or trout species that make up a very small recreational fishery in the upper section of the Thousand Islands section (see Table 1).

New York State applies size limit restrictions to most of their sport fish except for yellow perch, rock bass, bluegill and pumpkinseed. Ontario applies a size restriction to only one species of fish in the Thousand Islands, Middle Corridor sections of the river. A muskellunge must be at least 112 cm (44 inches) in total length before it can be legally kept in Ontario waters. This same size limit applies to New York waters.

A committee, with representation from the OMNR, The Ontario Federation of Anglers and Hunters, Muskies Canada, and Northern Ontario Tourist Outfitters, made recommendations aimed at managing muskellunge populations in Ontario. The St. Lawrence River has been identified by the committee as one of a limited number of waterbodies in Ontario having the growth potential capable to produce muskellunge of world record size. In order to increase the opportunity for an exceptional fish to survive to record size, a 54" (137.2 cm), minimum size limit is being recommended. A **Record Class Fishery** designation could have substantial marketing opportunities and benefits to the local tourism.

The OMNR and NYSDEC are interested in hearing your opinion on the proposal to recognize the muskellunge of the St. Lawrence River as a **Record**

Class Fishery with a recommended 54" (137.2 cm), minimum size limit.

In Ontario, a holder of a resident conservation fishing licence is subject to lower catch and possession limits than a regular, resident fishing licence holder. A similar licensing structure does not exist in New York State.

Catch and possession limits in New York and Ontario waters vary slightly for most fish species. There are no catch limits within the entire international portion of the river for yellow perch or panfish species except crappies.

Table 1. Summary of current fisheries regulations for Ontario (Division 11) and New York (Region 6) waters of the St. Lawrence River.

<i>Species</i>	<i>Open Season</i>		<i>Size Limit</i>		<i>Catch Limit</i>	
	<i>New York</i>	<i>Ontario</i>	<i>New York</i>	<i>Ontario</i>	<i>New York</i>	<i>Ontario</i>
Bass	3rd Saturday in June to November 30	Last Saturday in June to November 30	12"	None	5	6
Northern Pike	1st Saturday in May to March 15	1st Saturday in May to March 31	22"	None	5	6
Muskellunge	3rd Saturday in June to November 30	3rd Saturday in June to November 30	44"	44"	1	1
Walleye	1st Saturday in May to March 15	1st Saturday in May to March 15	18"	None	3	6
Sturgeon	Closed	Closed	NA	NA	NA	NA

Public inquiries should be directed to the following offices:

NYSDEC (315) 785-2262
OMNR (613) 476-3255

Fisheries assessment information presented in this paper was provided by the Lake Ontario Fisheries Management Unit, Ontario Ministry of Natural Resources, R. R. 4 Picton, Ontario K0K 2T0 and Region 6 Fisheries Unit, New York State Department of Environmental Conservation, 317 Washington Street, Watertown, New York 13601. Additional information was obtained by a review of scientific literature and reports from other sources.

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