Reintroduction of the Striped Bass:

An Important Milestone in Restoring the St. Lawrence River

Background

The Striped Bass (*Morone saxatilis*) is a species typically found in river estuaries and inshore waters of the North American East Coast. It is an anadromous fish, meaning that spawning, egg incubation and early fry development take place in fresh water. Juveniles later move downstream toward brackish estuary waters to feed and grow for a few years before reaching maturity.

Photo: Rachel Gingras collection

Young Striped Bass feed primarily on small invertebrates, gradually shifting to fish prey as they grow.

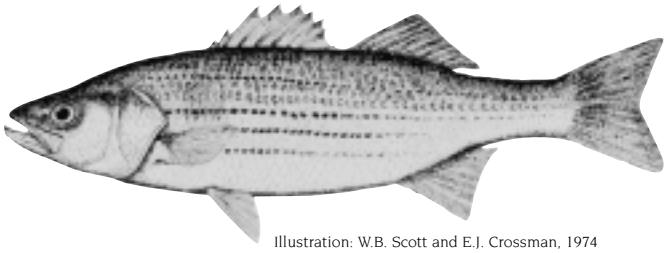


Illustration: W.B. Scott and E.J. Crossman, 1974

The existence of an abundant population of Striped Bass is a good indicator of the state of a river and its estuary, as it requires the fulfilment of several conditions relative to habitat quality and prey abundance.

First, the Striped Bass must have access from the sea to river sections where temperature and current conditions are suitable for spawning, egg incubation and initial development of fry. Upon exhausting their yolk-sac reserves, fry begin to forage and zooplankton — tiny invertebrates — must be highly abundant in the water, otherwise their survival is very low. Individuals who transcend this critical month-long period assume the typical shape of bass that they will keep throughout their lives. From this phase forward, they can better tolerate variations in ambient conditions and their chances of survival rise.

Fish over one year old also require an abundance of food, invertebrates or fish, for their growth in the estuary. Striped Bass typically travel in schools of like-sized individuals along the coast; they can cover tens of kilometres a day to feed.

Illustration: R.J. Mansueti, 1958

Overview of the Situation

Many populations of Striped Bass are found along the American Eastern Seaboard. Some don't stray far from the estuary of their natal rivers, but a few large populations undertake long coastal migrations between Florida and the Bay of Fundy. This is the case for populations from the Hudson River, New York, from tributaries of Chesapeake Bay, Maryland, and from the Roanoke–Albemarle system in North Carolina.

The St. Lawrence River was once home to the northernmost indigenous population of Striped Bass, whose distribution was restricted to a 300-km long stretch along the river and estuary, between Sorel and Kamouraska, Quebec. The location of the spawning ground was never found, but biologists at the time believed that it was somewhere in Lake Saint-Pierre or the vicinity.

In summer, St. Lawrence Striped Bass foraged and grew in the estuary between Quebec City and Kamouraska, mostly along the south shore. Individuals of all sizes could be found, anywhere in the summer range, but the smallest specimens were most abundant in the vicinity of Île d'Orléans. The larger fish stayed near Rivière-Ouelle and Kamouraska (Figure 1).

The St. Lawrence Striped Bass was heavily exploited. Sport fishing was particularly intensive in July and August, during the summer holidays. Villages along the estuary held annual fishing derbies for Striped Bass, attracting people by the hundreds.

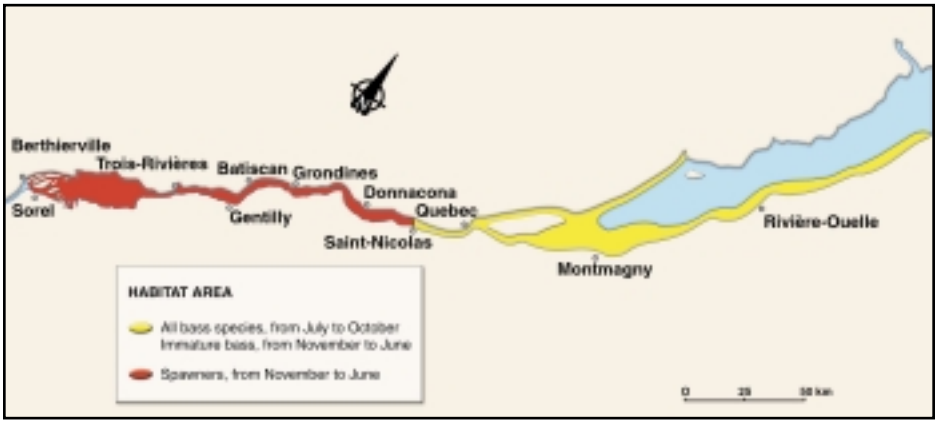
Striped Bass were also caught using fixed fishing gear set up all along the shore. Commercial seine fishers took to the inshore areas of several St. Lawrence islands between Île Madame and Île aux Oies.

According to commercial catch reports, the St. Lawrence Striped Bass population declined markedly from the mid-1950s onward. Landings, which had until then fluctuated between 5 and 50 tonnes annually, fell to less than 3 tonnes in 1957, and stayed under this level until 1965, the last year a commercial catch was recorded for this species (Figure 2).

Recreational catches appear to have followed suit. The last bass catch at the Montmagny fishing derby was recorded in 1963. The odd fish was caught using a rod and reel up until 1968.

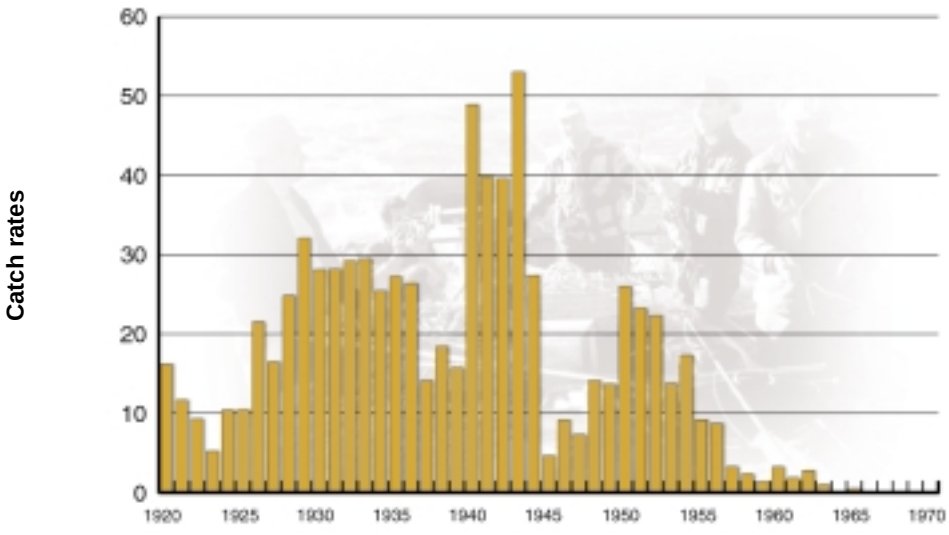
For a short time, in the early 1980s, it was thought that the population might be recovering when a hundred or so fish were caught in Quebec, mostly around the Gaspé peninsula. The fish, however, turned out to be from the Miramichi River in New Brunswick, a tributary to the southern Gulf of the St. Lawrence.

Figure 1. Distribution of Striped Bass in the St. Lawrence



Source: J.A. Robitaille, 2002.

Figure 2. Striped Bass commercial catch in the St. Lawrence, 1920–1970



Source: J.A. Robitaille, 2001.

The St. Lawrence Striped Bass was finally designated as an extirpated population in 1996.

For the fishers and riverside residents who witnessed the extinction of the Striped Bass, the event signalled the river's degradation, particularly in terms of water quality. Many people quit fishing altogether or stopped practising recreational activities on the river.

Regional leaders have argued repeatedly in favour of reintroducing the Striped Bass. However, the causes behind its disappearance were not known and the project was plagued by uncertainty. A recent study suggests that eradication of the population did not result from the irreversible degradation of critical habitats such as spawning grounds, but was rather the product of a particular set of circumstances. A major encroachment on feeding habitats of immature fish seems to have shrunk their distribution to a smaller area along the south shore and contributed to increasing fishing mortality.

A working committee was set up in 1998 to weigh the possibilities and examine the constraints of the return of the Striped Bass. It also planned the steps of a reintroduction program. In 2001, the *Société de la faune et des parcs du Québec*, together with its main partners in wildlife management, decided to move ahead with the plan. The Fédération québécoise de la faune has supported the project from the beginning with determination and engagement. Moreover, the Fondation de la faune du Québec has supported the project with a substantial financial contribution.

The project was launched publicly in summer 2002, with the release of a dozen adult Striped Bass and a few hundred juveniles. Striped Bass will be produced in hatchery and released as fingerlings into the St. Lawrence River starting in 2004. The maximum artificial production capacity, an estimated 50 000 fish per year, should be reached by 2008. Young bass will be stocked at this pace for a period of about ten years.

It is expected that individuals released to the river will survive in sufficient numbers to reproduce naturally, thereby initiating the process of rebuilding the population.

Outlook

The case of the St. Lawrence Striped Bass is not unique. Many Striped Bass populations in the United States have been decimated while others have disappeared entirely.

The situation of the St. Lawrence bass is very similar to the problems encountered by the populations of Chesapeake Bay, whose numbers remained very low for two complete decades (1970s and 1980s).

A number of studies were conducted to identify the causes of the decline and to find solutions, but to no avail. Although bass abundance continued to decrease, some coastal U.S. states showed little interest in reining in their fisheries. Thus, the U.S. federal government finally intervened, imposing a blanket fishing moratorium. The subsequent rapid recovery of the populations confirmed that the problem stemmed from overfishing of immature bass.

With hindsight, scientists acknowledge that the populations rebuilt themselves from the spawning of large fish, some of them over 30 years old, which were protected by a maximum-size fishing regulation.

The situation of the St. Lawrence Striped Bass seems to have been similar, except that no group was spared. Immature bass made up most of the commercial catches, whereas the larger

Photo: Maurice Fortin collection

KEY VARIABLES

The following elements would serve as good clues to the recovery of Striped Bass in the St. Lawrence River:

Data confirming that stocked bass feed and grow at a rate similar to that of the original population.

Evidence of natural reproduction: eggs, fry or fingerlings of wild origin taken in the natural environment.

Restoration of the species in most of its original range.

Abundance restored sufficiently to allow for a sustainable fishery. Establishment of a properly managed sport fishery generating economic activity in the Middle Estuary.

specimens, presumably spawners, were specifically sought out by anglers. Large bass probably also suffered from poaching when they overwintered in Lake Saint-Pierre.

In the end, the St. Lawrence Striped Bass population, which had shown resilience to heavy fishing for decades, was made to bear yet another pressure: the alteration of the feeding habitats of immature fish when a section of the ship channel near île d'Orléans was enlarged. This change probably aggravated the effects of the fishery, raising mortality so high that the population could not withstand it, and the St. Lawrence Striped Bass finally disappeared.

Given that the extinction of the Striped Bass population was the result of a particular combination of circumstances and that these causal factors can be better controlled today, the reintroduction of this species now seems possible.

To Know More

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State of the St. Lawrence Monitoring Program

Four government partners — Environment Canada, the ministère de l'Environnement du Québec, the Société de la faune et des parcs du Québec, and Fisheries and Oceans Canada — are pooling their expertise and efforts to provide Canadians with information on the state of the St. Lawrence and long-term trends affecting it. To this end, environmental indicators have been developed on the basis of data collected as part of each organization's ongoing environmental monitoring activities. These activities cover the main components of the environment, namely water (quality and quantity), sediments, biological resources (species diversity and condition), uses and, eventually, shorelines.

For additional copies or the complete collection of fact sheets, contact the St. Lawrence Vision 2000 Coordination Office:

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The fact sheets and additional information about the program are also available on the Web site: **www.slv2000.qc.ca** .

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