

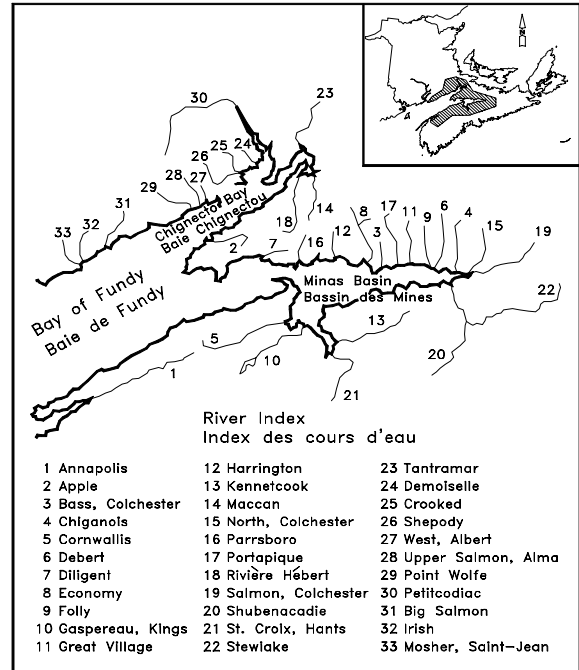
Atlantic Salmon Inner Bay of Fundy SFA 22 & part of SFA 23

Background

Atlantic salmon (*Salmo salar*) of the inner Bay of Fundy rivers generally share similarities in geography, biology and probably marine distribution. Inner Bay of Fundy stocks inhabit twenty-six rivers in Salmon Fishing Area (SFA) 22, Nova Scotia, and ten rivers in SFA 23, east of the Saint John River, New Brunswick. Salmon of Inner Bay of Fundy usually enter rivers in the fall of the year, have a high proportion that recruit to spawning after one winter at sea, are not generally known to migrate to the North Atlantic Ocean, and have high survival between spawnings.

Two stocks, Annapolis and Gaspereau, are situated in SFA 22 but are different than the Inner Bay of Fundy stocks; they have a significant 2-sea-winter salmon component and migrate to the northwest Atlantic.

The Inner Bay of Fundy stocks have been in decline since 1986. The rivers inhabited by Inner Bay of Fundy stocks have been closed to all fishing for salmon since 1990.



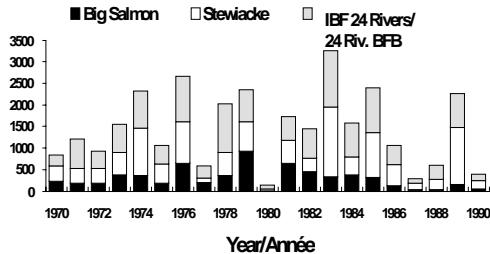
The Fishery

Inner Bay of Fundy rivers historically supported commercial and recreational salmon fisheries. Commercial fisheries situated in the inner Bay of Fundy landed annually an average of 1,061 salmon during the period 1970 to 1984. The fishery was closed in 1985 and all licenses have since been retired.

Average annual recreational catches for 25 of 33 Inner Bay of Fundy rivers were 1,462 small salmon (< 63.0 cm) and 597 large salmon (≥ 63.0 cm) for the period 1970 to 1990. Not since 1990 has a recreational fishery opened for either retention or catch and release in Inner Bay of Fundy rivers.

Over the same period, the Inner Bay of Fundy rivers have been closed to Aboriginal Peoples fisheries as well.

Catch/ Prises Sportives



In 1996, only the Gaspereau River was open to a catch-and-release fishery. Both the Gaspereau and the Annapolis stocks inhabit rivers situated in SFA 22 but neither has a stock typical of the Inner Bay of Fundy.

Resource Status

Inner Bay of Fundy Stocks

The status of the Inner Bay of Fundy salmon stocks is largely assessed on the basis of the performance of the Stewiacke and Big Salmon River stocks. The current year’s assessment is based on an electrofishing-boat survey of the adults in the Stewiacke River, a shore count of adults on Big Salmon River, a monitor of juveniles in several rivers through the use of electrofishing gear, and a count of smolts from a tributary of the Stewiacke River. Also referenced here are data from a counting fence operated on the Stewiacke River from 1992 - 1995.

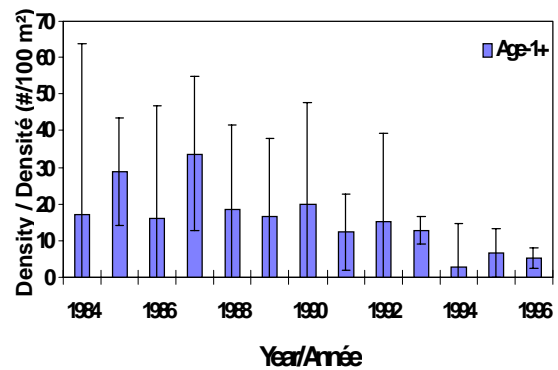
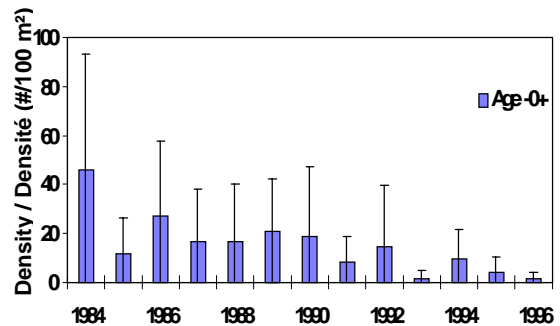
In general, conservation requirements have not been met since 1989 in any Inner Bay of Fundy river and current stock levels are very low.

Stewiacke River: Stewiacke River adult escapements since 1992, as indexed by an electrofishing boat catch per unit effort, are 25% of values observed prior to 1992. A

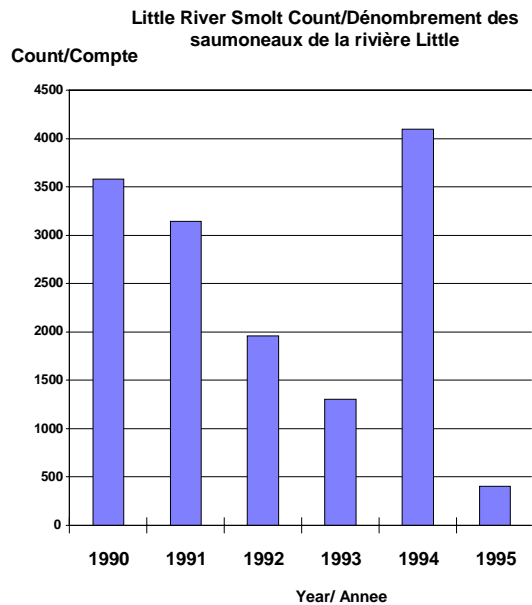
total adult count on the river as recent as 1994 indicated a return of 221 grilse and large salmon. The two previous year population estimates were 409 fish in 1993 and 240 fish in 1992. Total returns in those three years and since are low compared to the conservation requirement of 1,061 grilse and large salmon.

Densities of age-0+ and age-1+ salmon parr in the Stewiacke River have declined significantly since 1990 and are currently very low.

Rivière Stewiacke/
Stewiacke River



Production of smolts measured in Little River, a tributary of Stewiacke River, has closely followed juvenile salmon densities. The dramatic decline in the natural production of all ages of parr and smolts reflects the decline in the wild salmon spawning stock.

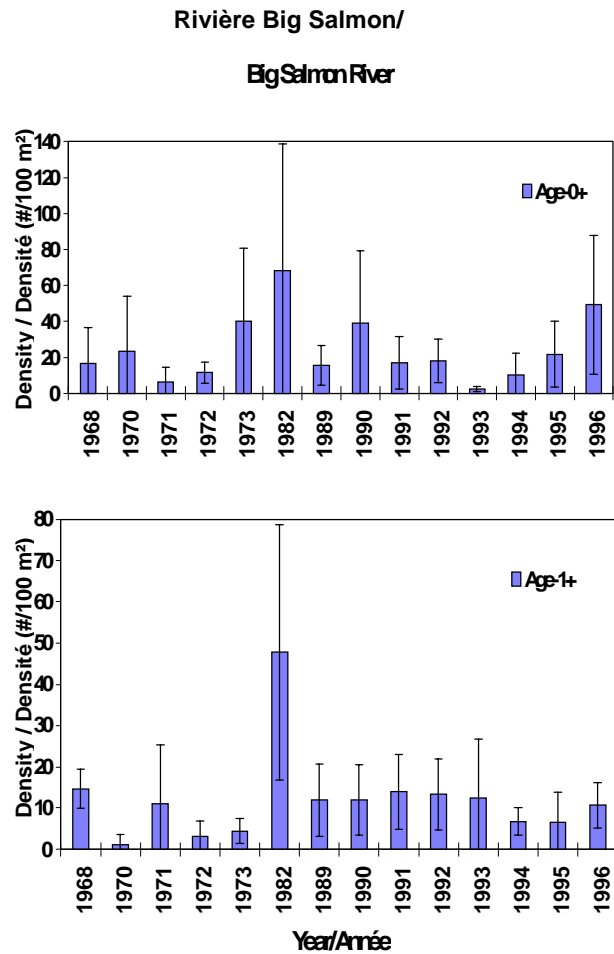


The stocking of hatchery smolts has proved to be ineffective for enhancing the Stewiacke salmon stock. Their failure to return in significant numbers is further evidence that the Inner Bay of Fundy stocks are experiencing low marine survival.

Big Salmon River: Approximately 110 grilse and large salmon were estimated from visual counts to have returned to Big Salmon River in 1996 (New Brunswick Department of Natural Resources and Energy). A return of this magnitude corresponds to 16% of the conservation requirement of 700 salmon.

Juvenile density measurements for Big Salmon River do not show the same dramatic decrease noted in the Stewiacke River. The most notable differences are the higher densities of age-0⁺ parr in 1995 and 1996. These higher densities are assumed to be the result of releases into the river of mature adult salmon of native stock origin grown in saltwater cages. The releases, conducted by the Big Salmon River Association and the New Brunswick Department of Natural Resources and

Energy, occurred in both 1994 and 1995 and amounted to more than 200 adults in each year. The spawning success of these cage-grown adults was confirmed by the presence of age-0⁺ parr above a natural obstruction to passage where a small number of the cage grown adults were placed in 1994.



Other Inner Bay of Fundy Rivers: Electrofishing at nine sites in six other Inner Bay of Fundy rivers in 1996 confirmed that juvenile populations were low throughout the area. Densities of age-0⁺ parr were extremely low and densities of older parr were about half of historic values. The densities observed in these six rivers reflect

more the pattern observed in the Stewiacke River than in the Big Salmon River.

Non-Inner Bay of Fundy Stocks

Only the Annapolis and Gaspereau rivers stocks fall under this grouping. Information to assess these stocks are limited to data collected during broodstock collections for the hatchery program and an adult count made in the fishway near the mouth of the Gaspereau River.

Annapolis River: Both low angling catches and seining operations carried out during the past several years to collect broodstock for the hatchery program indicate stock abundance to be low. Amongst the 14 fish collected in 1996, one was an aquaculture escapee that presumably originated from the cage culture operations at the mouth of the river. Eighteen of 39 fish (46%) observed during recent collections were identified as returns from hatchery releases.

Gaspereau River: The counting of salmon in the fishway at White Rock on the Gaspereau River indicated a total return of 178 fish in 1996. This return, comprising 58% hatchery fish, equaled 107% of the conservation requirement for the river.

Outlook

Salmon returns to all Inner Bay of Fundy rivers are extremely low as a result of abnormally low sea survival experienced by 8 of the last 10 smolt classes (the exceptions being the 1988 and 1990 smolt classes). Based on estimates of parr densities and the smolt counts in the Stewiacke River, there is little chance for these stocks to recover within the next four years.

Neither the Gaspereau River nor the Annapolis River salmon stock are expected to meet conservation requirements even with hatchery returns included, considering the low marine survival that these and other distant migrating stocks are experiencing. The Gaspereau River stock may yield a small surplus of hatchery return grilse in 1997. There is virtually no chance that the Annapolis River stock will yield returns of salmon that are surplus to conservation requirements within its next two life cycles (10 years). In addition to being extremely low, this stock is severely hampered by other factors (e.g., fish passage, acidification, agricultural practices).

Management Considerations

Marine survival continues to be low and there is no indication when conditions may change. As well, juvenile densities are low; thereby potentially delaying recovery if marine survival were to improve. No fishery should be considered until stocks rebuild. Any significant recovery should be expected to take at least a generation (4-5 years) under conditions of greatly improved marine survival.

Inner Bay of Fundy stock levels are reduced to the point that action should be considered to hedge against their extinction.

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References

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