

Atlantic Salmon Northumberland Strait Nova Scotia part of SFA 18

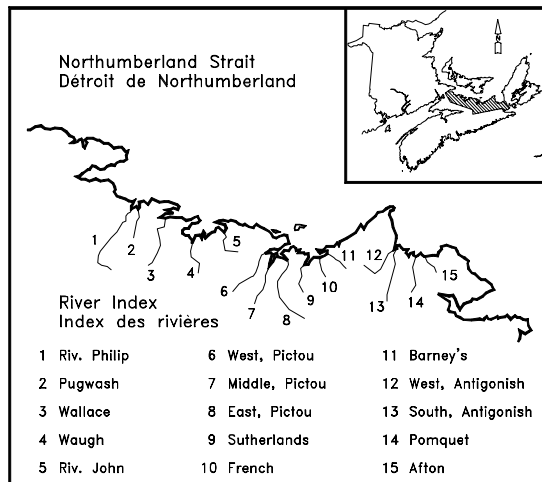
Background

Fifteen rivers on the Northumberland Strait shore of Nova Scotia support Atlantic salmon stocks. Stock status information for 1997 is provided for nine of these stocks based on the conservation requirements and escapements calculated either from mark-and-recapture experiments (River Philip) or catch rates (proportion of fish which are hooked and released) in the angling fishery. Additional information is provided on East River, Pictou; River Philip; and West River, Antigonish, which contributes to understanding of the status of the stocks in this area.

Conservation requirements for these rivers are defined as 2.4 eggs per m² for accessible habitat.

The eggs required to meet the conservation requirement for the Northumberland Strait area rivers are expected to come exclusively from large (>63 cm) salmon. Small (<63 cm) salmon are required to provide a 1:1 ratio of males to females in the spawning stock. East River, Pictou, stock characteristics (large 60% female; small 95% male) were used to estimate the required spawners for East River, Pictou; John; Philip; Sutherlands; Wallace; Waugh; and West, Pictou rivers. South River stock characteristics (large 50% female; small 97% male) were used to estimate the number of spawners for the South and West, Antigonish, rivers.

The Atlantic salmon stocks of the Northumberland Strait area typically enter rivers in late autumn, usually after September 15. Aboriginal and sport fisheries occur on several rivers in the area.



Summary

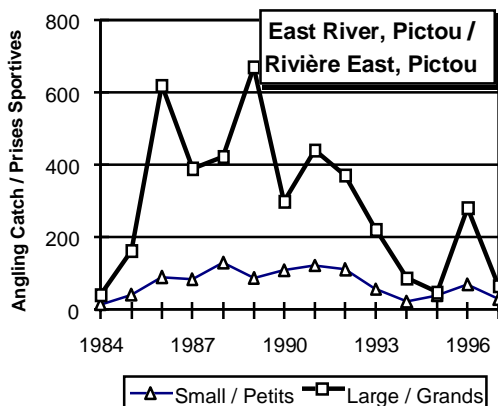
- The numbers of large and small salmon returns to the nine rivers assessed in 1997 met or exceeded conservation requirements.
- Returns to the East, Pictou; Philip; and West, Antigonish; rivers in 1998 are expected to be less than in 1997 but greater than conservation requirements. There is no basis for forecasting returns to the other rivers in the area.

The Fishery

Salmon angling seasons on the Northumberland Strait rivers have not changed for several years and were open from September 1 to October 31.

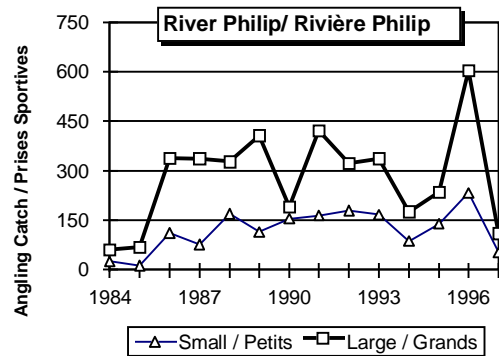
The 1997 Atlantic salmon sport catch on these rivers, as estimated from license stubs, was 147 small salmon retained, 79 small salmon released, and 636 large salmon released. The preliminary total angling catch of 862 fish in 1997 was 31% of the 1996 catch of 2,800 fish and approximately one-half of the 1992-1996 average catch of 1,600 fish. The total catch of large salmon in 1997 was less than one-third of the 1996 catch and about one-half of the five-year mean.

The hook-and-release catch of large salmon on East River, Pictou, in 1997 (65 fish) was well below the 1996 catch of 275 fish. The 1996 catch was the highest large salmon catch reported since 1992 and near the 10-year mean catch (1987-96) of 322 fish. The sport catch of small salmon (harvest plus release) was only 29 fish in 1997, low compared with the catch of 74 fish in 1996 and the average 56 fish over the previous five years.

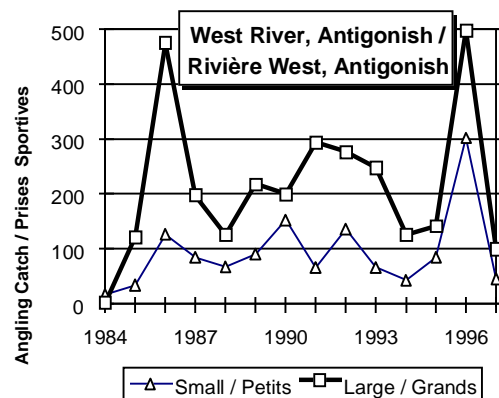


On River Philip, anglers caught only 52 small salmon in 1997 compared with an estimated

233 in 1996 and 161, on average, the previous five years. The large salmon catch of 110 fish was 17% of the 1996 figure and 32% of the 1992-96 average catch of 346 fish.

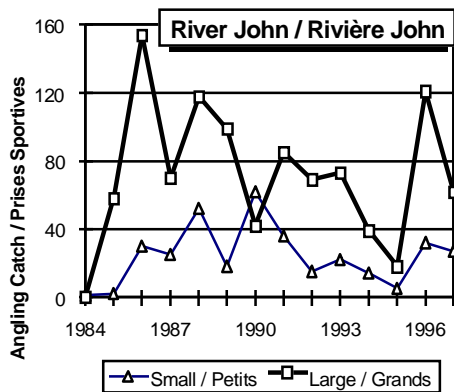


The catch of small salmon in West River, Antigonish in 1997 (45 fish) was also low relative to the 1996 catch of 283 fish and the 1992-96 mean of 122 fish. The 1996 catch of small salmon was the highest of the 1984-1996 period. In 1997, 100 large salmon were reported released. This is the lowest large salmon catch reported since 1984.



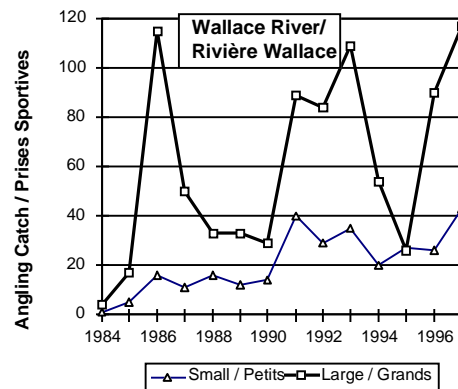
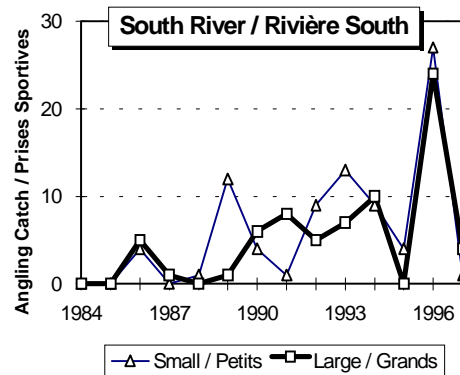
Unlike the other rivers, angling catches in River John improved in 1997. The number of fish angled, 27 small and 62 large salmon was similar to the 1992-96 mean catches, but below the recent-term high of 1996. Anglers only reported catching a total of 4 fish on

South River in 1997 compared with 46 in 1996. The low number for 1997 is not unusual for the South River where catch reports are often just a handful of fish; the 1987-96 average total catch for the river was 11 fish as a result of a number of years when no fish were angled. The catch of fish on the Wallace River was a departure from the trend of the other area rivers in 1997. Anglers caught a record number of small and large salmon relative to 1984-96 catches. The catch per angler, 2.23, was the highest of the 1984-96 period and well above the mean for the period of 0.84 fish per angler.



Anglers fishing the other smaller rivers in the area are few and catches were low.

Five Aboriginal groups (the Native Council of Nova Scotia, and Indian Brook, Millbrook, Pictou Landing and Afton First Nations) either harvested salmon from Northumberland Strait rivers or had the rivers listed in their respective fishing plans or licenses. Pictou Landing reported harvesting 40 large salmon on East River, Pictou. Millbrook First Nation harvested 21 large fish on River Philip. Similar to previous years, the total harvest by Aboriginal groups in 1997 was low.



Resource Status

A mark-and-recapture experiment was used to estimate the adult returns to River Philip, for the second year in a row. Salmon were captured in seines, marked with highly visible streamer tags and released. Snorkel divers floated the river and counted the number of marked and unmarked fish.

A catch rate for the angling fishery was calculated for River Philip and that rate applied to angler catches on the other area rivers to estimate salmon returns. The catch rate was estimated to be 0.17 for large salmon, 0.29 for small salmon, and 0.20 for all fish combined.

Escapements on the river, estimated from the mark-and-recapture experiment, exceeded requirements; the large salmon escapement

was 171% of the required 358 fish and the small salmon escapement was 175% of the required 75 fish.

A similar mark-and-recapture study was unsuccessful on East River, Pictou. Fish were marked at the head of tide and the snorkel diver survey was limited to the upper river because of visibility and crew size issues. This limited the effectiveness of the mark-and-recapture experiment. Consequently, snorkel diver counts of fish obtained in 1997 were applied to the 1996 count efficiency estimates on East River, Pictou, to provide an estimate of population size. A second estimate was calculated using the catch rate from River Philip. Large salmon escapement estimates exceeded the conservation requirement of 271 fish by 31% (diver survey) or 11% (catch rate). Small salmon spawners exceeded the required 57 fish, regardless of procedure, by 16-32%.

West River, Antigonish, salmon returns (estimated using the River Philip catch rate and angling catch on West River) achieved 162% of the large salmon requirement of 353 fish. All small salmon spawners are surplus to requirements; all spawner eggs are expected to come from the large fish which are 50% female.

Average juvenile densities in West River, Antigonish, in 1997 exceeded 300 fry and 100 parr per 100m² (4 sites fished in 1997). This suggests that the conservation requirement has been exceeded on this river in recent years.

Snorkel divers conducted a survey of Sutherlands River, which discharges into Merigomish Harbour, after the close of the angling fishery, and observed surplus large (46) and small (25) salmon relative to the

required number of spawners of 25 and 5 fish, respectively. This survey is useful for indicating the state of returns to the three small rivers in the area, Sutherlands; Barney's; and French, Pictou; where angling data are usually not available.

Low estimates of spawners on South River, based on catch rates and reported catches in the sport fishery, were a cause for concern; spawners were not believed to have met requirements in 1995 or 1996. Electrofishing data collected in 1997 at 3 sites during five minutes of fishing indicated that fry (age 0+) and parr (age 1+ and 2+) were abundant (>75 fry per five minutes at all 3 sites). Over 60 age 1+ parr were captured at the lower site on the river which was located below a dam (which has fish passage) but no one-year-old fish were found at the two sites located upstream of the structure. The number of juveniles present in the system indicates that spawning numbers of salmon were good during recent years, but that fish were not successful at passing the dam in all years. The low number of fish angled on the South River in 1997 cannot be considered evidence of low returns based on the contradictory evidence angler reports and juvenile numbers presented in past years.

Escapement estimates to the other rivers in the area were derived using the catch rates from River Philip for salmon and grilse and the angling catch derived from the license stub reported catches. Escapement estimates indicate spawners were sufficient to meet conservation requirements on River John; Wallace River and West River, Pictou. The number of fish angled in 1997 declined from 1996 on the Waugh and West, Pictou, rivers, but increased on the Wallace. Using the same method, the estimated number of spawners in

the Waugh River was estimated to be below the conservation requirement.

Estimated escapements to the Wallace River were well above the conservation requirement after previous years assessments indicated that returns were below those levels, two years in a row, in 1995 and 1996. Juvenile salmon densities in the Wallace River in 1996 were lower than those noted in recent years in the other rivers in the area. In 1997, numbers were either higher or lower than in 1996, depending on the site, but generally low compared to densities in neighboring rivers.

Environmental Considerations

The September and October mean daily discharge on Middle River, Pictou, which is at the midpoint of the Northumberland Strait area, was the second lowest of the 1966-97 period. These extremely low water levels, which persisted until about 2 days before the angling season closed on October 31, kept fish from proceeding upriver beyond the lowermost pools in the various systems. These conditions limited angling opportunities on some rivers but provided increased opportunities on others, for a short period of time, because fish in some cases were crowded into one or two pools.

Outlook

Short term

Based on past performance, as indicated by recent large and small salmon returns and juvenile densities, returns in 1998 can be expected to exceed conservation requirements in all rivers where estimates are available.

Long term

Juvenile density data on all rivers in the area indicates that the freshwater component of the Northumberland Strait area of Nova Scotia salmon stocks is healthy and should contribute to returns sufficient to provide surpluses for the next 3-5 years. Surpluses will only be realized if the marine survival of smolts for stocks from this area, does not worsen appreciably over the next few years.

Management Considerations

Some of these salmon stocks are expected to have relatively high surpluses in 1998.

Low return estimates in 1995 and 1996 for the Wallace River stock, plus moderate juvenile densities, indicate that in spite of surplus spawners in 1997, caution should be exercised concerning any large salmon harvest in this river in 1998.

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References

O'Neil, S.F., D.A. Longard and C.J. Harvie.
1998. Atlantic salmon (*Salmo Salar L.*)
stock status on rivers in the
Northumberland Strait Nova Scotia area,
in 1997. DFO Canadian Stock Assessment
Secretariat Res. Doc. 98/36.

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