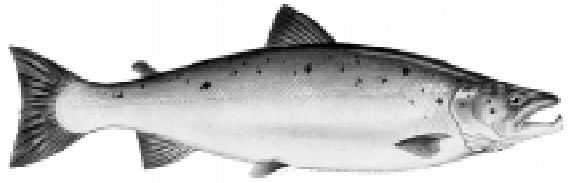


Atlantic Salmon Southern Nova Scotia SFA 21

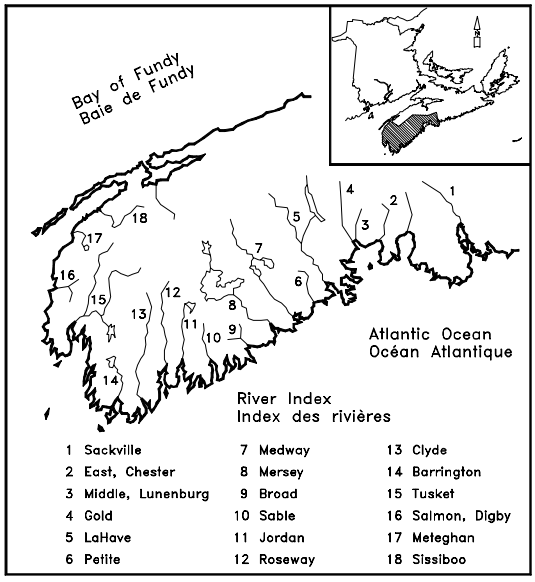
Background

Atlantic salmon (Salmo salar) in rivers along the southcoast of Nova Scotia occupy a geological area known as the Southern Upland zone. Rivers in this zone are affected to varying degrees by acid rain and accordingly have been classified into four categories based on average annual pH: I) rivers in which acid toxicity precludes natural sustainability of salmon, II) rivers in which salmon stocks are highly impacted by acidification and salmon are remnant, III) rivers which are partially impacted by acidification and salmon persist, and IV) rivers which are minimally impacted by acidification Salmon stocks are known to have been lost in eight rivers, remnant in eight, impacted in four, and minimally impacted in three.

Stocking of hatchery smolts is widespread. Salmon angling effort remained high in five rivers and occurred in seven other rivers in 1996. Three acid toxic rivers are stocked with hatchery smolts to provide fisheries for returning adult salmon.

Salmon stocks in SFA 21 are generally composed of fish that mature after one (grilse) and two (two sea-winter salmon) winters at sea. Egg deposition is contributed in equal portions by large salmon and grilse. Large salmon have about 1.5 times the number of eggs per fish than that of grilse. Harvests of fish ≥63.0 cm (large salmon)have been restricted since 1984 and management of escapement is by allocation of fish <63.0 cm (small salmon).

Complete counts and biological data have been available since 1972 at Morgan Falls fishway. Morgan Falls is the principal site for assessment of the status of salmon stocks of SFA 21.



The Fishery

Harvests by First Nations and Aboriginal Peoples in SFA 21 during 1996 were 218 grilse.

As in previous years commercial fisheries were closed and by-catch of salmon in other local fisheries was prohibited.

The recreational fishery opened May 10 and closed August 15 in all rivers of SFA 21 except the Clyde, Jordan and Mersey rivers where the fishery closed September 30. Only small salmon were permitted to be retained in the recreational fishery. Retention was delayed until June 1 on all but the Clyde, Jordan and Mersey rivers where retention was permitted throughout their extended seasons. Throughout the season, the daily bag limit for retention of small salmon in SFA 21 was one fish (reduced from two fish per day in 1995).

Angling effort increased in 1996 by 35% over 1995 to 18,350 rod days. Estimated angling catches were 2,180 retained and 557 small salmon released in 1996, a 66% increase from 1995. The 530 large salmon estimated to have been released in 1996 represents a 42% increase over 1995. Catch per rod day increased to 0.178 in 1996 from 0.112 in 1995. Effort, number of small salmon retained and numbers of small and large salmon released in 1996 were all greater than the 1991 to 1995 mean values.

Three rivers, LaHave, Medway and Gold, provided 80% of the SFA catch in 1996. These category III rivers have significant areas of non-acidified water, have average main river pH's above 5.1 and are supported by hatchery stocking.

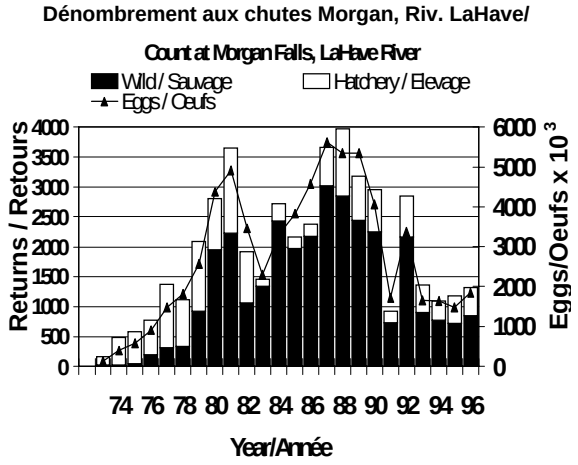
Aboriginal and recreational catches in category I rivers, which make up 15% of the salmon production area of SFA 21, accounted for 2% of the reported catch in SFA 21. All of category I catches came from the Clyde River. Category II rivers compromise 30% of the production area but accounted for only 8% of the reported catch. Category III rivers have 50% of the production area and had 84% of the catch. Category IV make up 5% of the area and accounted for 6% of the reported catch.

Resource Status

Stock status relative to conservation is difficult to assess for the rivers in SFA 21 because almost all of them are acid impacted to some extent. Conservation requirements for most of these rivers have yet to be defined because the necessary information, principally pH data, is incomplete.

In the absence of definitions of conservation requirements for most of the rivers in SFA 21, and considering that the majority of the rivers are heavily stocked with hatchery parr and smolts, the status of the stock above Morgan Falls on the LaHave River is used as an index of the "general health" of the stocks in SFA 21. This section of the LaHave River is partially impacted by acidity and, like the other major salmon producing rivers in the SFA, receives hatchery stocking annually.

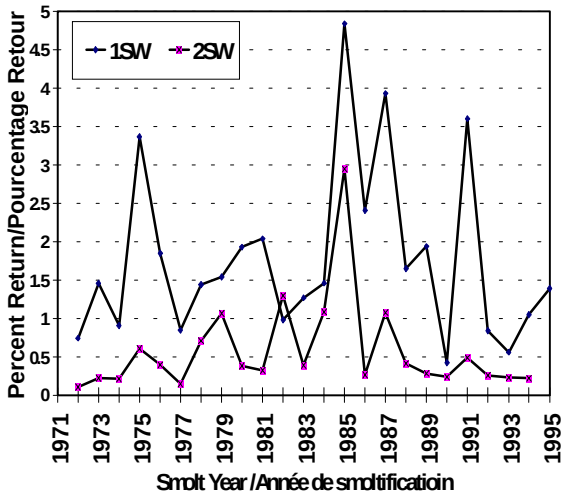
Returns of wild salmon and grilse to Morgan Falls have declined from a high of 3,015 in 1987, to 847 in 1996 (Figure 2). Returns have decreased even though distant and local interceptory fisheries have been closed.



In spite of the decrease in returns of wild salmon to Morgan Falls and average exploitation in the angling fishery, 94% of the conservation requirement (1.96 million eggs) was achieved in 1996. Returns from hatchery stocking contributed 32% of the conservation requirement above Morgan Falls.

The decline in returns to Morgan Falls is not the result of previous low spawning escapements. Instead, low returns in recent years reflect lower marine survival rates. This is apparent in the return rate of hatchery smolts released into the LaHave River. Return rates for hatchery smolts released from 1990 to 1995 averaged 1.49% for 1-sea-winter (1SW) and 0.29% for 2-sea-winter (2SW) salmon, down from 2.95% and

1.0%, respectively, for releases made 1985 to 1989.



Outlook

Short term

Wild salmon are not expected to meet conservation requirements in any of the rivers in SFA 21 in 1997. The forecast return to Morgan Falls indicates a surplus to conservation requirements of hatchery grilse in 1997. Some surpluses of hatchery grilse should be available in rivers receiving significant smolt stocking.

Long term

Until marine survival improves substantially, wild grilse and large salmon are not expected to return in adequate abundance to achieve conservation requirements.

No improvement in wild salmon returns as a result of improved water quality (reduced acidity) is expected in the next four to five years.

Management Considerations

The use of returns to Morgan Falls as an indicator of stock status requires verification. Firstly, productivity above Morgan Falls may not be representative of all rivers in SFA 21. Secondly, evidence exists that some fish counted at Morgan Falls are falling back over the Falls and thereby not contributing to the spawning escapement above Morgan Falls. The extent of this fallback needs to be determined.

Forecasts of returns in 1997 suggest there is a 93% chance that the present conservation requirement above Morgan Falls of 1,320 fish will be met in 1997, without a harvest fishery and without accounting for non-return fallback. With a fishery similar to 1996 and without accounting for non-return fallback, the chance of meeting the conservation requirement is 75%.

Assuming the Morgan Falls counts of salmon are an index of returns to all SFA 21 rivers, and considering the stocking of 298,000 hatchery smolts in the main salmon producing rivers of SFA 21 in 1996, a reduced fishery on grilse returns to the various rivers throughout the SFA in 1997 should not adversely affect resource conservation. If feasible, harvests should be hatchery grilse. Morgan Falls trap counts should again be looked to as a useful gauge of within-year run strength for SFA 21. Native salmon stocks are lost to the Mersey, Jordan and Clyde rivers as a result of acidification and obstructed fish passage (Mersey River only). Since no specific conservation requirement exists for these rivers, in-river exploitation of returns of both grilse and large salmon can be maximized.

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