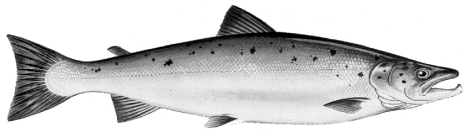

Newfoundland & Labrador Atlantic Salmon 2002 Stock Status Update

Background

There are 15 Atlantic salmon (Salmo salar) management areas, known as Salmon Fishing Areas (SFAs) 1-14B, in Newfoundland and Labrador (Figs. 1-2). Within these areas there are more than 200 rivers with reported Atlantic salmon populations characterized by differences in life history traits including freshwater residence time, age at first spawning, and the extent of ocean migrations. Spawning populations consist of varying proportions of small (fork length < 63 cm) and large (fork length ≥ 63 cm) salmon. The majority of rivers in Newfoundland contain populations of small salmon or grilse which are predominantly maiden fish (never spawned before) that have spent one year at sea before returning to spawn (one-sea-winter salmon, 1SW). In Labrador (SFAs 1-2, & 14B), and western Newfoundland (SFAs 13 & 14A), there are important large salmon components that contain a mixture of maiden fish that have spent two (2SW) or more years (MSW) at sea before spawning and repeat spawners which are returning for a second or subsequent spawning. In other Newfoundland rivers, the large salmon component consists mainly of repeat spawners.

Conservation requirements for Atlantic salmon rivers are considered to be threshold reference points. The consequences of egg depositions below conservation to the long-term sustainability of the stock are unknown but the likelihood of deleterious effects are greater when egg depositions are below conservation. Conservation requirements are established for individual rivers in insular Newfoundland (SFAs 3-14A) and Labrador Straits (SFA 14B) based on 2.4 eggs per m^2 of river rearing habitat and 368 or 105 eggs per hectare of lake habitat, depending on the river system. Conservation requirements have been established for only a few SFA 1 & 2 rivers. The status of stocks is assessed on the basis of the proportion of the conservation egg deposition achieved in a given year and the trends in abundance of various life stages. There should be no fishing mortality on stocks that are below 100% of conservation.

Summary

Labrador

- Returns of small and large salmon in SFA 1 decreased relative to 2001.
- For SFA 2, returns of small salmon were slightly below average runs, while large salmon increased.
- Overall, salmon abundance as evidenced by returns to four counting facilities, appears to be low considering closure of commercial fisheries.

Northeast and eastern Newfoundland (SFAs 4-8)

- Conservation requirements were achieved in only one (Campbellton) of six monitored rivers.
- For some rivers, stocks declined for the third or fourth time since 1997.
- Campbellton River and Middle Brook (99% in 2002) have met or exceeded conservation requirements each year of assessment during the moratorium.
- Gander River has met or exceeded conservation requirements in only two of the last six years.
- Exploits River, Terra Nova River and Northwest River (Port Blandford) have yet to achieve conservation.
- Northwest River (Port Blandford) improved greatly in 2002 (38%) over 2001 but remains low overall.

Southern Newfoundland (SFAs 9-11)

- Conservation spawning requirements were achieved in three out of four monitored rivers; the exception was Rocky River.
- Stock abundance in two rivers (Conne and Northeast (Trepassey)) improved in 2002 but continues to be lower during the commercial salmon fishery moratorium than prior to the moratorium.
- In general, stocks improved in comparison to 2001 but not in comparison to the 1992-2001 means.

Southwest Newfoundland (SFAs 12-13)

- Conservation requirements were not achieved in any of the seven rivers monitored in SFA 13.
- Harry's River and Flat Bay Brook were the only rivers to improve relative to both the previous year and the long-term average. The percent of the conservation requirement achieved on Harry's River was the highest since assessment began in 1992.
- Highlands River and Fischells Brook improved by more than 50% compared to 2001 but declined relative to the 1992-2001 mean.
- Crabbes River declined relative to both 2001 and the long-term average and has been declining since 1997.
- Crabbes and Middle Barachois rivers have yet to achieve conservation requirements since the moratorium.

Northwest Newfoundland (SFA 14A)

- Conservation requirements were exceeded in three out of four monitored rivers.
- Lomond River (except in 2001), Torrent River and Western Arm Brook have exceeded conservation requirements in all years since the moratorium.

- **Smolt production** in insular Newfoundland in 2002 was high to moderately high in four of five monitored rivers by comparison with the long-term average. Record numbers occurred at Northeast Brook (Trepassey) and there was a slight increase at Rocky River. However, in three rivers (Conne Western Arm Brook, Campbellton) smolt production declined from 6% to 12% relative to 2001 with Campbellton River close to the lowest on record. When smolt production declines, returns of small salmon are expected to be lower unless marine survival increases.

- **Marine survival** in insular Newfoundland in 2002 increased at three (Conne, Northeast Brook (Trepassey), Western Arm Brook) of five monitored rivers by comparison with 2001, but declined at both Campbellton and Rocky rivers. Overall, marine survival remains highly variable and generally low given the substantive reductions in directed ocean fisheries.

Environmental conditions

Freshwater **-** Freshwater environmental conditions can be inferred by examining the frequency and extent that salmon rivers were closed for environmental reasons. During the 2002 angling season, 24 out of 158 scheduled rivers in insular Newfoundland (15.2%) were closed for varying periods of time because of low water levels and warm water temperatures. As a result, 2.4% of the potential fishing days were lost, the least amount since 1993. In

contrast, 18.2% of potential fishing days were affected in 2001, suggesting improved freshwater conditions in 2002.

Marine - Ocean temperatures at Station 27 off St. John's Newfoundland for the first eight months of 2002 indicate above normal conditions during January and February but a colder-than-normal anomaly near the surface during most of the spring, with values reaching near 0.5°C below normal in April. During June to August, conditions warmed to above normal values near the surface with a cold sub-surface anomaly in the depth range of 30-50 m. Oceanographic data from spring and summer surveys of the Newfoundland Shelf generally show below normal volumes of cold-intermediate-layer (CIL <0°C) and above normal bottom temperatures in most areas of the eastern shelf.

Monthly air temperatures in northern areas (Iqaluit and Goose Bay) were below normal during the first six months of 2002 while values farther south at St. John's Newfoundland, for example, were either normal or above normal for four of the first six months of 2002. Although sea-ice data are not yet available for 2002, it appears that the retreat of sea-ice from the Labrador Shelf was later in 2002 compared to that observed during the past 4-5 years.

Preliminary analyses have shown associations between marine environmental conditions and both marine survival of salmon and adult salmon run timing (Colbourne et al., 2002).

The Fishery

A five-year (2002-2006) integrated Atlantic salmon fisheries Management Plan was introduced for Newfoundland and Labrador in 2002 Anon. (2002a). The recreational salmon fishery was again managed based on the river classification system that was introduced for SFAs 3-14B (Anon. 1999). In the 2002 Management Plan, some rivers were reclassified.

In SFA 13 in 2002, Highlands River was designated as a Class IV river and open for catch and release angling from 31 August to 7 October. Middle Barachois River was upgraded to Class III in 2002 and along with Robinsons River and Flat Bay Brook was open for catch and retain angling from 24 June to 9 July. Fischells Brook, Cooks Brook and Harry's River above Home Pool remained closed to all angling.

The recreational salmon fishery for all Labrador rivers opened 15 June and closed 15 September. Retention of large salmon is not permitted in SFA 14B of Labrador. In SFA 1 and some SFA 2 rivers, anglers could retain four salmon for the season, other scheduled salmon rivers in SFA 2 were given a Class III designation, with a seasonal retention limit of two small salmon and no large salmon. The lower retention limit for some rivers in SFA 2 was implemented as a precautionary measure to prevent increased fishing mortality expected as a result of increased accessibility via the Trans-Labrador Highway. Rivers without direct access from the highway were left at four salmon, as was previously the case.

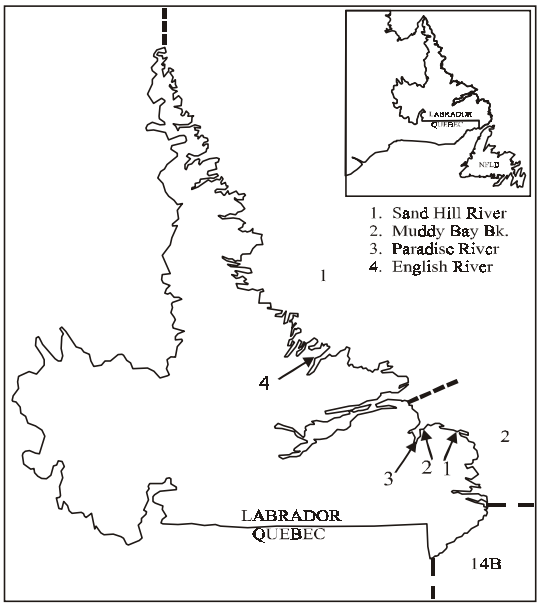

Figure 1. Map illustrating the location of Salmon Fishing Areas of Labrador, along with salmon rivers assessed in 2001. Labrador rivers were not assessed relative to conservation requirements.

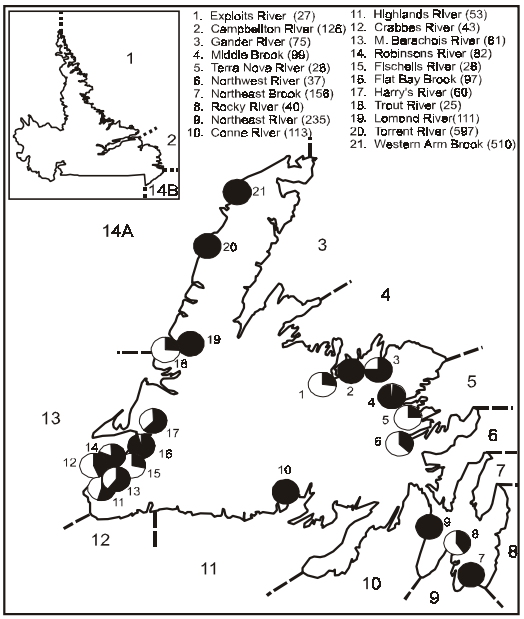

Figure 2. Map illustrating the location of the Salmon Fishing Areas of Newfoundland, along with various salmon rivers assessed relative to conservation requirements. The black portion of the circle and the numbers in parentheses indicate the percentage of the conservation requirement achieved for each river in 2002.

Aboriginal salmon fisheries occurred in Labrador under communal licence similar to 2001. A food fishery for residents of Labrador in 2002 permitted retention of up to four salmon.

There has been no commercial salmon fishing in insular Newfoundland since 1992; the Straits area of Labrador (SFA 14B) since 1997; and the rest of Labrador (SFAs 1-2) since 1998.

Commercial salmon fishing in Greenland territorial waters was suspended in 2002. Greenlanders continued a very small subsistence harvest.

Newfoundland - Angling catch statistics from licence stub returns in 2002 are not yet available.

Labrador - Angling catch data for SFAs 1 and 2 were derived, as in previous years, from records kept by Department of Fisheries and Oceans (DFO) River Guardians and logbooks from outfitting camps. In 2002, the total angling catch in SFAs 1-2 was 5,211, the lowest since 1997. The total angling effort was 4,947 rod-days, the lowest since 1995. The catch of small salmon was 4,510 (1,220 retained and 3,290 released) and large salmon was 701 (202 retained and 499 released) (Fig. 3). In SFA 1, the total catches (small and large salmon combined) of 779 decreased 37% over 2001. In SFA 2, the total catch of 4,432 was 6% lower than in 2001. Total catches in SFAs 1-2 were the lowest in five years. The proportion of salmon released by anglers in Labrador, which has been increasing over time, was 73% of the total catch, and was the highest reported to date. In total, there were 3,789 small and large salmon reported to have been hooked and released in 2002.

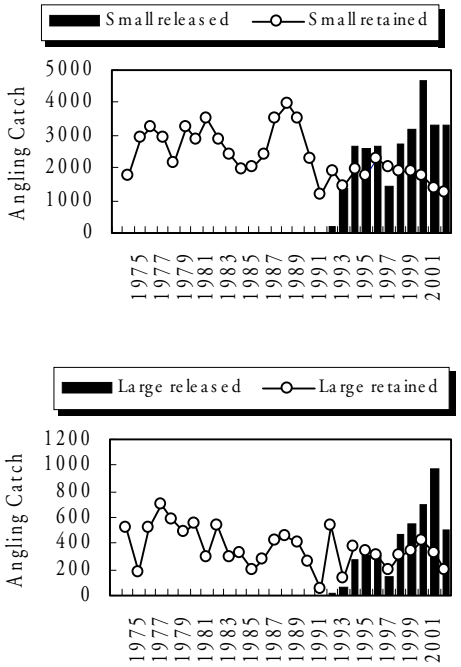

Figure 3. Angling catch statistics of small and large salmon in Labrador SFAs 1 & 2, 1974 – 2002 (data for 2002 are preliminary).

Preliminary information available on food fishery catches indicates that about 16 tonnes (6,600 salmon) were harvested in 2002, of which large salmon represented 16% of the catch by weight and 29% by number.

Food fisheries landings for salmon in Labrador as of 29 October 2002.

	Small salmon		Large salmon		Total	
Year	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
2000	5,323	10,353	1,352	5,262	6,675	15,613
2001	4,789	9,789	1,673	6,499	6,478	16,288
2002	5,554	11,196	1,101	4,633	6,646	15,829

Resource Status - Adult salmon

During the commercial salmon fishery moratorium (in place beginning in 1992 in insular Newfoundland and 1998 in Labrador), the numbers of small and large salmon returning to rivers in insular Newfoundland are considered to be the total numbers of salmon that survive the marine environment. Spawning escapements are determined by accounting for known removals of salmon, including recreational harvests, brood-stock collections, in-river mortality, or scientific samples. Recreational harvests in 2002 were, for most rivers, estimated based on average catches derived from licence stub returns in 1997-2001. Hence, returns of small and large salmon and values for percentage conservation requirements achieved are preliminary. Adult salmon returns in 2002 were monitored in 21 rivers in insular Newfoundland and four in Labrador (Table 1).

Four of the 21 watersheds assessed in insular Newfoundland (Exploits River, Northwest River, Terra Nova River and Rocky River) have undergone enhancement (colonization) activities that made vast amounts of habitat accessible to salmon. These stocks are still in the development stage and are not expected to achieve conservation egg deposition in the near future.

Labrador (SFAs 1-2, 14B)

There are now 28 scheduled salmon rivers in SFAs 1-2 and 14B, although many other rivers contain populations of Atlantic salmon. Prior to the closure of the Labrador commercial salmon fishery in 1998, landings (small and large salmon combined) averaged 369 tonnes annually during the period from 1984 to 1989, and 111 tonnes per year from 1990 to 1997, the period in which quotas and allowances were in effect. Commercial salmon landings during the last year of the commercial fishery (1997) were about 47 tonnes. By

comparison, approximately 16 tonnes of salmon were harvested in food fisheries in 2002.

The status of English River (SFA 1), Southwest Brook (Paradise River), Muddy Bay Brook, and Sand Hill River (SFA 2) (Fig. 1) was assessed using fish counting facilities. There are no additional facilities from which to determine the status of other Labrador salmon stocks.

Status

Returns of small salmon to English River and Southwest Brook, a tributary of Paradise River in 2002 decreased over 2001 by 16% and 28% respectively (Table 1). Returns of small salmon were the lowest since assessment commenced in 1999. Returns of large salmon decreased only in English River (22%) while Southwest Brook remained the same as in the previous year but 21% less than when it was previously assessed in 1999. It should be kept in mind that there was a food fishery by resident fishers in 2001-2002 that did not exist in 1999. The fishery would have harvested salmon outside of the river and these fish are not included in the returns.

Conservation spawning requirements for Labrador rivers have not been defined and the use of 2.4 eggs per m^2 of fluvial habitat and 105 eggs per hectare of pond habitat may not be appropriate (CSAS 2002). Efforts are needed to derive acceptable reference or conservation levels for Labrador rivers, as there is uncertainty in reconciling and comparing different reference criteria from these approaches.

Northeast and Eastern Newfoundland (SFAs 3-8)

Specific rivers assessed (N=6) include: Exploits, Campbellton, and Gander rivers in SFA 4, and Middle Brook, Terra Nova River and Northwest River (Port Blandford), in SFA 5 (Fig. 2). With the exception of Gander River, all stocks were assessed directly from salmon returning to fish counting facilities. The status of Gander River in 2002 was inferred from salmon returning to a fishway in Salmon Brook, a tributary.

Status

Total returns of small salmon in 2002 were mixed - three of six monitored rivers had returns decreasing by 19% (Exploits), 25% (Middle) and 36% (Terra Nova) compared to the previous year, while two others (Campbellton and Gander) remained within plus or minus 10%. Only one river (Northwest) showed a substantial increase relative to 2001. All rivers had returns lower than the 1992-2001 average with three of six rivers (Campbellton, Middle and Terra Nova) having the lowest returns in 10 years. Returns of large salmon were somewhat less variable, with only two of six rivers having decreased returns (Exploits River by 34% and 18% Terra Nova River by 18%) compared to 2001. The remaining four rivers either had returns similar to 2001 (Campbellton, Gander, Middle) or increasing (Northwest by 67%). All stocks had returns of large salmon less than the 1992-2001 mean. Conservation spawning requirements were met only at Campbellton River but Middle Brook achieved 99% (Fig. 2, Table 1). Campbellton River and Middle Brook (except in 2002) have exceeded their conservation spawning requirements in

each of the years they have been assessed during the moratorium (Table 1). Gander River has met or exceeded conservation requirements in only five of 11 years, and has declined relative to conservation requirements in each of the past three years. Terra Nova River, Exploits River and Northwest River (Port Blandford) have yet to achieve conservation spawning requirements. Particular concern is warranted for rivers in SFAs 4-5 where stocks have declined. Notably, the lower Exploits River has declined relative to the rest of the system (Bourgeois 2003) and the percent of conservation requirements achieved for Northwest River (Port Blandford) fell to 11% in 2001. However, returns to Northwest River (Port Blandford) improved greatly in 2002, achieving 38% of its conservation requirement.

South Newfoundland (SFAs 9-11)

Specific rivers assessed (N=4) include: Northeast Brook (Trepassey) and Rocky River in SFA 9, Northeast River (Placentia) in SFA 10, and Conne River in SFA 11 (Fig. 2). Spawning escapements of the above stocks are assessed using fish counting facilities while mark-recapture methods are used to survey smolt production at Conne River.

Status

Total returns of small salmon in 2002 increased over the previous year in all rivers, with increases in some instances ranging from 20 to 70% above those of 2001. Returns of large salmon increased in Rocky and Conne rivers but decreased by 39% and 75% respectively in Northeast Brook (Trepassey) and Northeast River (Placentia). With the exception of Rocky River, all monitored stocks had returns less than the 1992-2001 means, with the greatest declines in small and large salmon occurring at Northeast Brook (Trepassey) and Northeast River (Placentia).

Conservation spawning requirements in 2002 were achieved in all monitored rivers except Rocky River (Fig. 2). In general, the percentage achieved increased in comparison to 2001 but not in comparison to the 1992-2001 mean. At Conne River, percent of conservation requirements achieved rose to 113%, meeting its requirement in eight of the past 11 years, while Rocky River has yet to achieve conservation requirements.

Southwest Newfoundland (SFAs 12-13)

Specific rivers assessed (N=7) include: Highlands River, Harry's (Pinchgut) River, Crabbes River, Middle Barachois Brook, Fischells Brook, Robinsons River, and Flat Bay Brook (Fig. 2). Crabbes, Fischells, Robinsons, Middle Barachois and Flat Bay rivers were assessed by snorkelling surveys, Highlands River by a fish counting facility, while the status of Harry's River was inferred from snorkelling surveys and salmon returning to a counting facility in Pinchgut Brook, a tributary.

Status

Returns of small salmon increased, relative to 2001, in four monitored rivers ranging from 40% (Flat Bay Brook) to 65% (Harry's River) above 2001 returns (Table 1), while returns declined in three rivers (Crabbes River, 10%; Middle Barachois Brook, 43%; and Robinsons

River, 50%). Returns of small salmon to all rivers (except Harry's) declined relative to the 1992-2001 mean ranging from 4% (Flat Bay Brook) to 52% (Fischells Brook). Returns of large salmon in three monitored rivers were similar to 2001 but declined in Crabbes River (26%) and increased substantially in Highlands River (34%) and Harry's River (120%) (Table 1). Compared with the 1992-2001 mean, returns of large salmon declined in all rivers except Middle Barachois Brook (37% increase) and Harry's River (142% increase). Returns of small and large salmon to Harry's River in 2002 were the highest on record, whereas, returns of large salmon to Crabbes River and Fischells Brook were the lowest on record.

Conservation requirements were not achieved in any of the monitored rivers in 2002 but the percent achieved increased in four rivers (Highlands, Fischells, Flat Bay, Harry's) compared to 2001 and on two rivers (Flat Bay, Harry's) compared to the 1992-2001 means (Fig. 2, Table 1). Harry's River stock showed a substantial improvement (82%) over 2001 with the percent of the conservation requirement achieved (60%) being the highest since assessments began in 1992. Highlands River and Fischells Brook improved by more than 50% compared to 2001 but declined relative to the 1992-2001 mean. The percent of conservation achieved in Crabbes River declined relative to both 2001 and the long-term mean. Crabbes and Middle Barachois rivers have yet to achieve conservation requirements since the moratorium. Crabbes and Fischells rivers were both less than 50% of conservation requirements in 2002.

Northwest Newfoundland (SFA 14A)

Specific rivers assessed (N=4) include Trout River, Lomond River, Torrent River, and Western Arm Brook (Fig. 2). All stocks are assessed using fish counting facilities. Trout River was assessed for the second time in 2002.

Status

Total returns of small salmon in 2002 to Lomond and Torrent rivers and Western Arm Brook, increased over the previous year, with increases in Torrent and Western Arm exceeding 60%. Returns of small salmon in Western Arm Brook were the third highest observed since the moratorium began but were below the 1992-2001 means for Lomond and Torrent rivers. Returns of large salmon decreased from the previous year and compared to the 1992-2001 mean in Lomond River but showed little change in Torrent River. Large salmon increased in Western Arm Brook compared to 2001 (71%) but returns were similar to the 1992-2001 mean. The percent of conservation requirements achieved in Trout River, was 25%, the same as in 2001.

Spawning escapements continue to exceed conservation requirements in Lomond and Torrent rivers and Western Arm Brook and have done so in all years (except Lomond River in 2001) since the closure of the commercial salmon fishery (Fig. 2, Table 1). Torrent River is an enhanced (colonized) stock and Lomond River is a stock that has benefited from construction of a fishway to improve fish passage.

Smolt production and marine survival

In insular Newfoundland, information on both smolt and adult salmon counts is reliably available from five rivers: Campbellton River (SFA 4); Northeast Brook (Trepassey) (SFA 9); Rocky River (SFA 9); Conne River (SFA 11); and Western Arm Brook (SFA 14A).

Smolt production

Smolt production in 2002 was high to moderately high in four of five monitored rivers by comparison with the long-term average. Record numbers occurred at Northeast Brook (Trepassey) (Fig. 4). However, in three rivers (Conne, Western Arm Brook, Campbellton) smolt production declined from 6% to 12% relative to 2001 with Campbellton River close to its all time low. Four of the five rivers experienced peak production in 1997. In rivers where smolt production declined, returns of small salmon are expected to be lower unless there is a compensatory increase in marine survival.

Marine survival

Marine survival, corresponding to adult small salmon returns in 2002, averaged 5.6% across all five rivers, ranging from about 3.0% at Conne and Rocky rivers, to 9.1% at Western Arm Brook (Fig. 5). This contrasts with an average survival of 3.8% (2.5% to 6.0%) for small salmon returns in 2001. Intermediate survivals occurred in 2002 at Campbellton (5.3%)

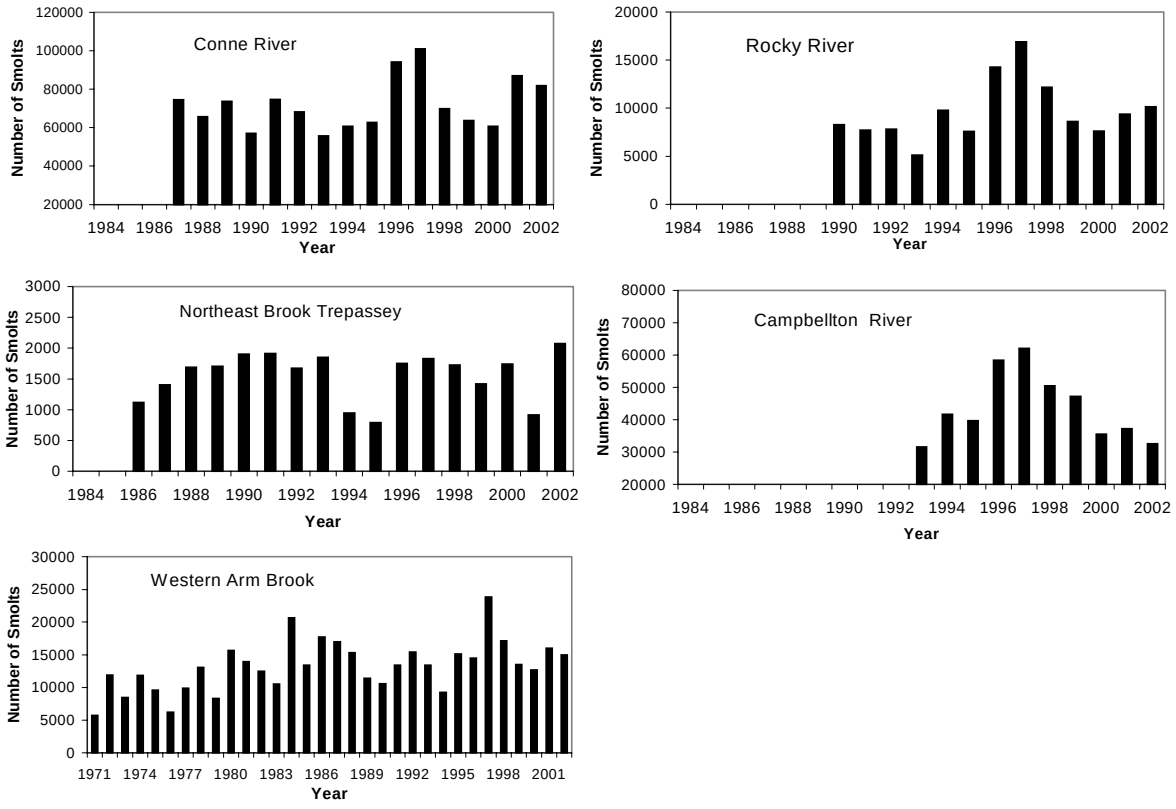

Figure 4 Trends in smolt production from various Newfoundland rivers.

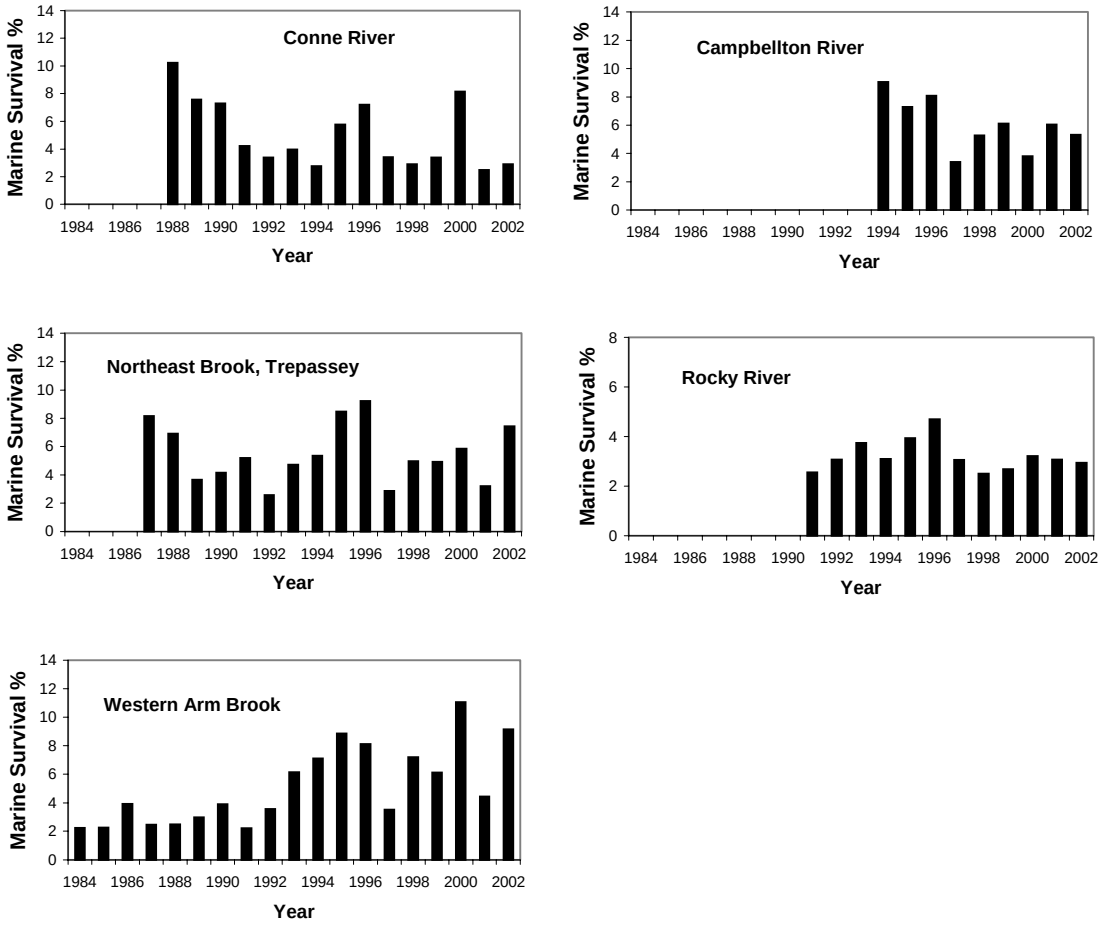

Figure 5 Marine survival rates for small salmon at various Newfoundland rivers. Survival rates have not been adjusted for marine exploitation in years prior to 1992 when commercial fisheries for salmon occurred.

and Northeast Brook (Trepassey) (7.4%), respectively, but only Northeast Brook (Trepassey) and Western Arm Brook had values that were higher than the average estimated for the moratorium years of 1992-2001. Overall, survival improved in three rivers by comparison with 2001, but declined at both Campbellton and Rocky rivers. Marine survival remains highly variable and generally low. Higher survival values have occurred in the past, even in years when directed ocean fisheries for salmon were in existence.

Salmon by-catch in bait nets

A study completed in 2002 (Anon. 2002b) concluded that there was no by-catch of salmon in bait nets set parallel to shore and sunk by one fathom. This result supports recommendations of a 2001 study (Reddin et al. 2002) that given the present fishing seasons, salmon by-catch would be minimized by setting bait nets parallel to shore where possible, with head ropes one fathom below the surface. Also bait nets should be kept away from salmon rivers and areas where salmon are concentrated.

Management Concerns

In **Labrador (SFAs 1-2, 14B),** the Trans-Labrador Highway has the potential to substantially increase exploitation of southern Labrador salmonid stocks due to easier access to rivers. Restrictions to angling imposed by the river classification system are a good start and efforts should continue to put regulations in place to prevent excessive fishing mortality on salmon populations.

Collectively, harvests in the Labrador Inuit Association and Innu Nation food fisheries, along with those in the resident food fishery in Lake Melville and southern Labrador, plus the angling fishery throughout Labrador have the potential to increase exploitation rates. Careful monitoring of stock status and the compilation of accurate catch statistics are essential to ensure the long-term sustainability of the resource. In the absence of resource monitoring coupled with harvest adjustments, sustainability could be jeopardized.

In **Northeast and Eastern** Newfoundland (SFAs 3-8), the improvement in the status of the salmon stock in Northwest River (Port Blandford) in 2002, is in part attributed to the publicity surrounding the public meetings and the formation of a working group to address the conservation/restoration of the salmon stock. Increased public awareness of the stock problems resulted in increased stewardship of the resource in 2002.

Salmon spawning populations in a number of rivers in SFAs 4-5 declined in four of the past six years. Consideration should be given to reducing mortality to ensure conservation requirements are not compromised.

In **Southern Newfoundland** (SFAs 9-11), some rivers (e.g. Northeast Brook (Trepassey), and Conne River) had average returns of small salmon in 1992-2002 that were lower than returns prior to the commercial salmon moratorium. Marine survival remains low even with the reductions in directed marine fisheries.

In **Southwest Newfoundland** (SFAs 12-13), particular consideration should be given to the conservation of salmon populations in SFA 13, especially in Bay St. George. Concern for these stocks has been registered for more than two decades. With few exceptions, spawning populations remain low, particularly in Highlands, Harry's, Middle Barachois, Fischells and Crabbes rivers. Fischells Brook stock has shown dramatic fluctuations from well above conservation requirements (2000) to only 18% in 2001. Crabbes River has been declining since 1997 and was below 50% of conservation requirements in 2002.

Consideration should be given to closing fisheries in Crabbes River in 2003 to avoid further compromising the stock.

The decline in the Middle Barachois stock is also of concern. There should be no retention of salmon in Middle Barachois River without expanding programs to reduce illegal removals.

Poaching in some Bay St. George rivers is believed to be a long-standing problem hampering stock recovery, and was again emphasised at public meetings.

The improvement in Harry's River stock in 2002 is in part attributed to publicity surrounding public meetings and the formation of a working group to address serious conservation problems and stewardship initiatives. Increased public awareness of the stock problems and increased stewardship helped to deter poaching in 2002.

In **Northwest Newfoundland** (SFA 14A), some rivers have returns that greatly exceed their conservation requirements, thus there is opportunity for increased harvest. However, given the high annual variability in marine survival, caution should be exercised when considering any change in fisheries management measures.

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Table 1. Summary of Atlantic salmon stock status in the Newfoundland Region. Conservation met refers to the actual percentage of the conservation spawning requirement achieved, but is intended as a reference level only for Labrador stocks, when reported. Refer to footnotes for definition of characters and abbreviations.

Region / River	Map SFA	Map Index	Method	Total Returns 2002 Small	2002 Large	2001 Small	2001 Large	1992-01 Small	1992-01 Large	Conservation met (%) 2002	2001	1992-01	1992-02	Status in 2002: Smolts Relative to: 2001	1992 - 01	Marine Survival Relative to: 2001	1992 - 01	Egg Deposition Relative to: 2001	1992 - 01
Labrador																			
English River	1	1	Fe	189	32	224	41												
Southwest Brook (Paradise River)	2	2	Fe	234	34	323	32												
Sandhill River	2	3	Fe	3087	516														
Muddy Bay Brook	2	4	Fe	104	11														
Newfoundland																			
Northeast Coast																			
Exploits River	4	1	Fw	15908	893	19665	893	20313	1197	27	34	39	0 of 11 yrs					↓	↓
Lower	4		Fw							65	98	121	7 of 11 yrs					↓	↓
Middle	4		Fw							25	27	26	0 of 11 yrs					⇔	⇔
Upper	4		Fw							3	5	8	0 of 11 yrs					↓	↓
Campbellton River	4	2	Fe	1974	123	2151	123	2820	295	126	148	253	10 of 10 yrs	↓	↓	↓	↓	↓	↓
Gander River *	4	3	EFw	13183	1835	12517	1682	18336	2382	75	81	101	5 of 11 yrs					⇔	↓
Middle Brook	5	4	Fw	960	68	1285	62	1830	139	99	139	200	10 of 11 yrs					↓	↓
Terra Nova	5	5	Fw	1435	270	2230	331	2144	392	26	36	35	0 of 11 yrs					↓	↓
Northwest River (Port Blandford)	5	6	Fe	443	114	102	50	398	125	38	11	35	0 of 8 yrs					⇧	⇔

Assessment: Fe = counting fence; MR = mark-recapture

Methods: Fw = fishway count; EFw = estimated from tributary fishway count in 2001; Sc = snorkel count

Trend symbols: ↓ > 10% decrease; ⇧ > 10% increase; ⇔ no change = ± 10%

Footnotes:

Map index numbers refer to text figure and legend.

Marine survival is from smolts in year i to small salmon in year i + 1.

Use of 240 eggs/100 m2 as a conservation requirement for Labrador rivers may not be appropriate, and is used here only as a reference level.

In some cases fewer years are included in the 1992-2001 mean for some rivers.

* Gander River was assessed using a fish counting fence from 1989 to 1999.

Table 1. Continued. Summary of Atlantic salmon stock status in the Newfoundland Region. Conservation met refers to the actual percentage of the conservation spawning requirement achieved, but is intended as a reference level only for Labrador stocks, when reported. Refer to footnotes for definition of characters and abbreviations.

Region / River	Map SFA	Map Index	Map Method	Total Returns 2002 Small	2002 Large	2001 Small	2001 Large	1992-01 Small	1992-01 Large	Conservation met (%) 2002	2001	1992-01	1992-02	Status in 2002: Smolts Relative to: 2001	Smolts Relative to: 1992-01	Marine Survival Relative to: 2001	Marine Survival Relative to: 1992-01	Egg Deposition Relative to: 2001	Egg Deposition Relative to: 1992-01
South Coast																			
Northeast Brook (Trepassey)	9	7	Fe	68	2	56	8	76	13	156	143	195	11 of 11 yrs	⇧	⇧	⇧	⇔	⇔	🡻
Rocky River	9	8	Fe	354	78	233	50	312	68	40	33	39	0 of 11 yrs	⇔	⇔	⇧	⇧	⇧	⇔
Northeast River (Placentia)	10	9	Fw	541	40	313	65	774	134	235	168	452	11 of 11 yrs					⇧	🡻
Conne River	11	10	Fe	2573	167	1503	140	2987	173	113	67	129	8 of 11 yrs	⇔	⇧	⇧	🡻	⇧	🡻
Southwest Coast																			
Highlands River	13	11	Fe	169	87	75	65	158	108	53	35	61	1 of 10 yrs					⇧	🡻
Crabbes River	13	12	Sc	620	133	687	180	823	241	43	53	54	0 of 7 yrs					🡻	🡻
Middle Barachois	13	13	Sc	536	161	934	141	905	118	61	80	68	0 of 6 yrs					🡻	⇔
Robinsons River	13	14	Sc	990	207	1972	223	1381	217	82	142	87	3 of 6 yrs					🡻	⇔
Fischells Brook	13	15	Sc	414	42	214	44	865	145	28	18	54	2 of 6 yrs					⇧	🡻
Flat Bay Brook	13	16	Sc	1590	210	1134	199	1652	242	97	71	73	2 of 6 yrs					⇧	⇧
Harry's River*	13	17	Fe	1665	286	1007	130	1523	118	60	33	39	0 of 11 yrs					⇧	⇧
Northwest Coast																			
Trout River**	14A	18	Fe	41	12	36	15			25	25		0 of 2 yrs					⇔	⇔
Lomond River	14A	19	Fw	921	68	660	77	995	87	111	88	143	10 of 11 yrs					⇧	🡻
Torrent River	14A	20	Fw	4414	431	2633	445	4509	475	597	400	715	11 of 11 yrs					⇧	🡻
Western Arm Bk	14A	21	Fe	1465	48	563	28	976	48	510	193	339	11 of 11 yrs	⇔	⇔	⇧	⇧	⇧	⇧

Assessment Methods: Fe = counting fence; Fw = fishway count; Sc = snorkel count; MR = mark-recapture; EFw = estimated from tributary fishway count in 2000

Trend symbols: 🡻 > 10% decrease; ⇧ > 10% increase; ⇔ no change = ± 10%

Footnotes:
Map index numbers refer to text figure and legend.
Marine survival is from smolts in year i to small salmon in year i + 1.
Use of 240 eggs/100 m2 as a conservation requirement for Labrador rivers may not be appropriate, and is used here only as a reference level.
In some cases fewer years are included in the 1992-2001 mean.
* Percent conservation met in Harry's River 2002 is considered to be 60-77%.
** Values for Trout River in 2002 are preliminary.