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Proceedings Series 2002/016

Série des compte rendus 2002/016

**Proceedings of the March 2002 Newfoundland Region Salmonid Stock
Assessment Meeting**

**March 4 – 5, 2002
St. John's, NF**

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March 2002

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ISSN 1701-1280

www.dfo-mpo.gc.ca/csas/

Canada

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ABSTRACT

The ninth annual Salmonid Stock Assessment Meeting for the Newfoundland Region was held in St. John's, Newfoundland, March 4 - 5, 2002. Overviews of general status of Newfoundland and Labrador salmon stocks, based on data compiled during 2001, were presented along with a specific assessment of Trout River, Gros Morne National Park. A discussion was also held on alternate means to derive conservation requirements for Labrador salmon stocks. Other presentations focused on a synthesis of trends in smolt production and marine survival, a survey of salmon by-catch in herring bait nets, and a generalized summary of changes in brook trout abundance as inferred from data collected at fish counting facilities. Oceanographic conditions in the Northwest Atlantic were also summarized. This report summarizes each of the various working papers presented and provides an account of the general status of stocks. Summary sheets for various salmon stocks assessed are appended.

RÉSUMÉ

La neuvième réunion annuelle d'évaluation des stocks de salmonidés pour la Région de Terre-Neuve a eu lieu à St. John's (Terre-Neuve) les 4 et 5 mars 2002. On y a présenté des aperçus de l'état général des stocks de saumon de Terre-Neuve et du Labrador, fondés sur les données recueillies en 2001, et une évaluation particulière de la rivière Trout, dans le parc national du Gros-Morne. On y a aussi discuté d'autres moyens de calculer les besoins en matière de conservation applicables aux stocks de saumon. Dans les présentations, il a été question d'une synthèse des tendances de la production de saumoneaux et de la survie en mer, d'un relevé sur les prises accessoires de saumon dans les filets de pêche du hareng d'appât et d'un sommaire généralisé des changements dans l'abondance de la truite apparaissant dans les données recueillies à une installation de dénombrement du poisson. On a aussi résumé les conditions océanographiques régnant dans l'Atlantique Nord-Ouest. Le présent rapport résume chacun des divers documents de travail présentés et rend compte de l'état général des stocks. Des sommaires concernant divers stocks de saumon y sont annexés.

INTRODUCTION

The ninth annual Newfoundland Region Salmonid Stock Assessment meeting was held in St. John's, Newfoundland, March 4 – 5, 2002, to review the status of Atlantic salmon stocks. In addition to Department of Fisheries and Oceans (DFO) Scientific staff, the meeting also included representatives from: Fisheries Management Branch, Parks Canada, Memorial University of Newfoundland, Labrador Inuit Association, Gander River Management Association, Salmonid Association of Eastern Newfoundland, Freshwater-Alexander Bay Ecosystem Corporation, Provincial Inland Fish and Wildlife, Miawpukek First Nations, Salmonid Council of Newfoundland & Labrador, and the Atlantic Salmon Federation.

This report contains a synopsis of the status of stocks in Newfoundland and Labrador along with summaries of each of the working papers presented at the March 2002 meeting. Summary sheets for various salmon stocks assessed are appended.

Complete details of the data and methodologies used in the assessments are published in the Department of Fisheries and Oceans Canadian Stock Assessment Secretariat Research Document series, while the overall report on the status of stocks is contained in Stock Status Report D2-01 (2002), Newfoundland & Labrador Atlantic Salmon Stock Status for 2001.

A copy of the agenda for the March 2002 meeting is provided in Appendix 1. Participants attending the assessment sessions, in whole or in part, are listed in Appendix 2, while working papers presented at the meeting are listed in Appendix 3. Individual stock status summary sheets are provided in Appendix 4.

SUMMARY OF SALMON STOCK STATUS

- Limited information from **Labrador** indicated that returns of small (< 63 cm) salmon in SFA 1 decreased while large (\geq 63 cm) salmon runs increased relative to 2000. For SFA 2, returns of small salmon were similar to 1999 runs, while large salmon increased. Overall, salmon abundance appears to be low, as evidenced by returns to two counting facilities when compared with rivers assessed in insular Newfoundland.
- In **insular Newfoundland**, 21 rivers were assessed relative to conservation. Of these, 7 stocks met or exceeded spawning requirements, four rivers were between 53 and 88%, while 8 rivers achieved less than 40% of their spawning requirements. Of the latter rivers, three were located in Bay St. George (SFA 13) (Highlands, Harry's and Fischells rivers), while three others (Exploits, Terra Nova, and Rocky rivers) were enhanced stocks that have been, or are undergoing colonization programs. In general, most monitored stocks declined, many dramatically, from 2000 levels and in some cases represents the third year of low returns since 1997.
- In **insular Newfoundland**, smolt production in 2001 increased from 4 to 43% at four of the five monitored stocks while declining by almost 50% at Northeast Brook (Trepassey) compared with 2000. When smolt production declines, returns of small salmon are expected to be lower unless there are corresponding increases in marine survival to compensate for the reduction in smolt numbers.
- In **Northeast and eastern Newfoundland** (SFAs 4 - 5), total returns of small salmon in 2001 were mixed: three of six monitored rivers had returns increasing by 20% (Campbellton River) to 60% (Exploits River) over the previous year, while three other stocks declined from 11% (Gander River) to 62% (Northwest River, Port Blandford) relative to 2000. All but one stock (Terra Nova) had returns lower than the 1992-2000 average. Returns of large salmon were also variable. Two stocks (Exploits, Terra Nova) increased substantially over 2000 while in the remaining rivers returns of large salmon declined from 13 to 67% with all but one (Exploits) having returns less than the 1992-2000 mean. Two of six stocks assessed met their conservation requirements in 2001. Particular concern is warranted for Northwest River that fell to 11% of conservation in 2001. Marine survival of smolts to returns of small salmon at Campbellton River increased from 3.8% in 2000 to 6.0% in 2001, similar to the average of 6.1% for the previous seven years.
- In **Southern Newfoundland** (SFAs 9 - 11), total returns of both small and large salmon in 2001 decreased over the previous year, with declines in some instances ranging from 40 to 75%. All monitored stocks had returns less than the 1992-2000 means, with the greatest declines in small salmon occurring at Northeast River (Placentia) and Conne River. Conservation requirements were attained only at Northeast Brook (Trepassey) and Northeast River (Placentia). Marine survival at Conne River fell to the lowest value recorded (2.5%), and was the third lowest (3.2%) in 15 years at Northeast Brook (Trepassey). In contrast, survival at Rocky River (3.1%) was similar to the previous year. Marine survival remains anomalously

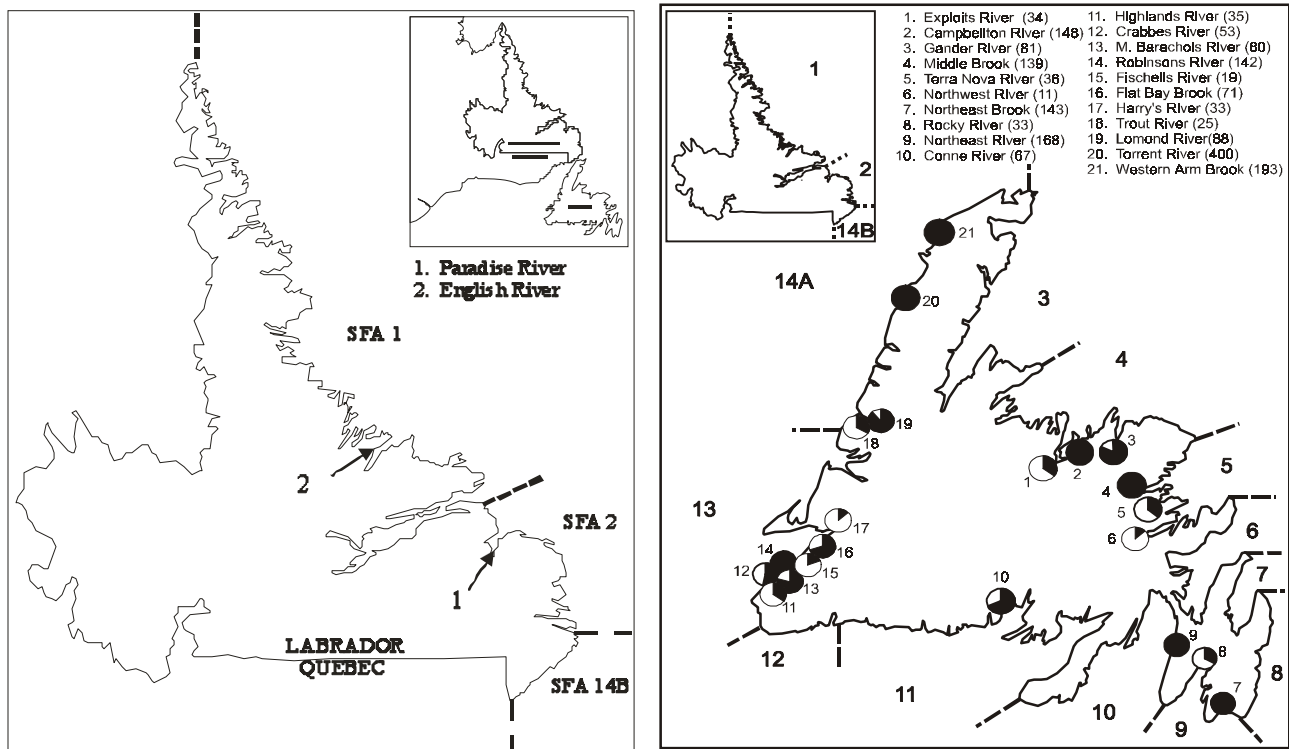
low given the reductions in directed marine fisheries for salmon during the past decade.

- In **Southwest Newfoundland** (SFAs 12 - 13), total returns of small salmon declined from 18 to 88% in five of seven monitored rivers with increases occurring only at Highlands and Robinsons rivers by comparison with 2000. Only one stock (Robinsons River) showed any marked improvement relative to the 1992-2000 average. Relative to 2000, total returns of large salmon similarly decreased from 3 to 84% in all but two stocks (Crabbes and Harry's rivers) where returns were 15% higher than the previous year. With the exception of Middle Barachois River, returns of large salmon were either similar to (Robinsons River), or well below the 1992-2000 average. Conservation spawning requirements were attained in only one of the seven stocks assessed (Robinsons River); Fischells River attained less than 20% of conservation. Marine survival of smolts to small salmon returns at Highlands River was similar to the previous year (0.6%) which had been the lowest recorded. Survival to 2SW salmon fell from 0.7% to 0.4%, the lowest value obtained since the moratorium began in 1992. Note, for rivers other than Highlands, estimates of total returns and percent conservation requirements achieved in 2001 are minimum estimates since there was evidence that runs were unusually late.
- In **Northwest Newfoundland** (SFA 14A), total returns of both small and large salmon in 2001 decreased over the previous year, with declines in some instances of more than 60%. Returns of small salmon were either the lowest (Lomond and Torrent rivers) or second lowest (Western Arm Brook) obtained since the moratorium began. All monitored stocks had returns of both small and large salmon less than the 1992-2000 means, with the greatest decline in small salmon occurring at Western Arm Brook. Conservation spawning requirements were not met at Lomond River nor Trout River. Marine survival of smolts to small salmon returns at Western Arm Brook decreased from 11.1% in 2000 to 4.4% in 2001.

SUMMARY OF PRESENTATIONS

A total of 17 working papers or presentations were made: 9 specific to salmon assessment, monitoring, or enhancement activities; one each on brook trout and rainbow trout; three related to environmental conditions and water quality; two on salmon by-catch; and one paper updated information specific to predation by gannets on Atlantic salmon in the Northwest Atlantic. One of the presentations included reference to an alternate approach by which conservation spawning requirements could be assigned to Labrador salmon stocks, although little was resolved on this topic. Twenty-one (21) stocks were assessed relative to conservation requirements in insular Newfoundland (plus three sections for Exploits River); two Labrador stocks (English River; Southwest Brook – Paradise River) were not assessed relative to conservation. Results for individual rivers are provided in the Summary Sheets (Appendix 4) but note that summary sheets were not prepared for all rivers.

The following maps illustrate the Salmon Fishing Areas of the Newfoundland Region, the individual rivers assessed, and percent of conservation egg requirements achieved in 2001.



SUMMARIES OF PAPERS PRESENTED

Physical oceanographic conditions on the Newfoundland and Labrador Shelves during 2001

Author: E. Colbourne

Summary: Annual air temperatures throughout most of the Newfoundland and Labrador Region were above normal during 2001. Annual mean air temperatures at Cartwright for example, on the southern Labrador Shelf warmed slightly over 2000 values to 1.4°C above normal. Air temperatures at both Goose Bay and St. John's were above normal for 8 out of 12 months by 1.35°C and 0.53°C, respectively. The North Atlantic Oscillation (NAO) index for 2001 was below normal indicating a reduced Arctic outflow to the Northwest Atlantic during the winter months. The spatial extent of the NAO atmospheric sea-level pressure fields during the winter months returned to normal, ending the anomalous eastward shift that occurred during 1999 and 2000. The index during 1999 and 2000 was similar to levels obtained during the cold early 1990s; however, the colder-than-normal environmental conditions usually associated with a high NAO index did not influence the northwestern side of the Atlantic. Sea ice on the southern Labrador and Newfoundland Shelves generally appeared late and left early, resulting in a shorter duration on the Newfoundland Shelf than usual. The total sea ice coverage in these areas during 2001 decreased slightly over conditions in 2000, remaining below average during both winter and spring.

The annual water column average temperature at Station 27 off St. John's, Newfoundland, for 2001, warmed slightly over 2000 values, remaining above the long-term mean for the third consecutive year. Surface temperatures were above normal for 9 out of 12 months, with anomalies reaching a maximum of near 1.8°C during October, with an annual value of about 0.5°C above normal. The March, April and May surface values were below normal. Bottom temperatures at Station 27 were above normal (by about 0.5°C) during all 12 months of 2001. The vertically averaged salinity for the summer months at Station 27 decreased over 2000 values to fresher than normal conditions. Annual temperature anomalies at 10-m depth in the inshore regions along the east and northeast coast of Newfoundland during 2001 were slightly cooler than 2000 values but remained above normal by between 0.5°-0.8°C. Temperatures on the south coast of Newfoundland however decreased to below normal values during 2001 compared to the above normal trend experienced from 1998 to 2000. The areas of the summer cold intermediate layer (CIL) of water <0°C on the eastern Newfoundland Shelf decreased over 2000 values to the lowest observed in 23 years.

In general, the below normal trends in temperature and salinity, established in the late 1980s on the Newfoundland Shelf reached minima in the early 1990s. This cold trend began to moderate during the mid 1990s and by 1996 temperature conditions were above normal over most regions. During 1997 to 1999 ocean temperatures continued above normal over most areas with 1999 being one of the warmest years in the past couple of decades. In general, during 2000 and 2001, ocean temperatures decreased over 1999 values, but remained above normal over most areas, continuing the warm trend. Ocean

salinity however, on the inner Newfoundland Shelf during most of the 1990s, continued to be slightly below the long-term average during most years. An examination of the survival of salmon returning to several rivers in the Newfoundland Region were found to be significantly correlated with upper layer ocean temperatures at a time lag of one year, indicating a possible environmental effect on the marine survival of smolts.

Perspectives on smolt production and marine survival of Newfoundland Atlantic salmon (*Salmo salar*) related to smolt size and run timing

Authors: J. B. Dempson, C. C. Mullins, C. Bourgeois, M. F. O'Connell, and D. G. Reddin

Summary: Information was presented on trends in Atlantic salmon (*Salmo salar*) smolt production and marine survival from six Newfoundland stocks. Smolt production and survival were found to vary among rivers, and among years within rivers. Annual variability in survival exceeds that of variation in smolt production. In general, survival is low, averaging between 1.6% and 6.0 % depending on the stock in question. In some cases, marine survival is actually lower, on average, since the commercial Atlantic salmon fishery closed beginning in 1992, than it was prior to the moratorium and for most, but not all stocks, survival is trending downward. Analyses of smolt size and run timing showed no consistent patterns among rivers as these parameters related to subsequent marine survival. Forecasts of pre-fishery salmon abundance, then, are difficult to make with any degree of required accuracy.

Comments:

A general discussion ensued as to the lack of directed research on problems associated with continued low marine survival of salmon. It was noted that some evidence suggests problems with marine survival could be occurring in near shore waters, but there was a lack of directed research to address this issue. It was acknowledged that if Science continues only to enumerate upstream migrating adult salmon, then much of the DFO salmonid 'expertise' is being used solely to document the decline in abundance and provide quality control to outside partnering groups, but doing little else to address the specific issues at hand.

Status of Atlantic Salmon (*Salmo salar* L.) Stocks of Insular Newfoundland, (SFAs 3-14A), 2001

Authors: M. F. O'Connell, J. B. Dempson, C. C. Mullins, D. G. Reddin, C. E. Bourgeois, T. R. Porter, N. M. Cochrane, and D. Caines

Summary: The commercial Atlantic salmon fishery moratorium, implemented in insular Newfoundland in 1992, entered its tenth year in 2001. Returns of small salmon to monitored rivers on the northeast and east coasts in 2001 increased over 2000 for Exploits (60%), Campbellton (20%), and Terra Nova (37%) rivers but decreased for Gander River (11%), Middle Brook (26%), and Northwest River, Port Blandford (63%). Returns of small salmon to Exploits and Terra Nova rivers in 2001 were similar to the means for 1992-2000, but the remaining rivers showed declines ranging from 26%

(Campbellton River) to 77% (Northwest River, Port Blandford). Returns of large salmon to Exploits River (97%) and Terra Nova River (43%) increased over 2000 but decreased in the range of 13 % (Gander River) to 67% (Middle Brook) for the remainder. In southern Newfoundland, returns of small salmon in 2001 decreased in all monitored rivers compared to 2000, being most pronounced for Little (78%) and Conne (78%) rivers. Declines also occurred in relation to the 1992-2000 means for all rivers (ranging from 27% for Rocky River to 62% for Northeast River, Placentia). Returns of large salmon also decreased in all rivers relative to 2000 (ranging from 33% for Little River to 75% for Northeast River, Placentia) and the 1992-2000 means (13% for Rocky River to 54% for Northeast River, Placentia). In Bay St. George (located in SFA 13), returns of small salmon to Highlands and Robinsons rivers in 2001 increased over 2000 (29 and 26%) but decreased in the range of 18% (Middle Barachois River) to 88% (Fischells River) for the remaining rivers in this area. Returns to Middle Barachois River remained similar to the 1992-2000 mean while Robinsons River improved (60%), but the remaining rivers all declined (range of 19% for Crabbes River to 79% for Fischells River). Except for Crabbes and Highlands rivers, returns of large salmon in 2001 decreased from 2000 (being most pronounced for Fischells River at 84%); returns decreased in relation to the 1992-2000 means for all except Middle Barachois and Robinsons rivers. On the northwest coast, returns of small salmon to Lomond River, Torrent River, and Western Arm Brook in 2001 decreased both from 2000 (37, 36, and 62%, respectively) and the 1992-2000 means (36, 44, and 45%, respectively); declines were also noted for large salmon (13, 25, and 77%, respectively and 13, 7, and 45%, respectively). Sea survival for small salmon in 2001 decreased in Northeast Brook, Trepassey, Conne River, and Western Arm Brook, remained similar to 2000 for Rocky River and Highlands River, while Campbellton River showed an increase. Smolt production in 2001 increased from 4 to 43% over 2000 for four of the five monitored stocks while Northeast Brook, Trepassey declined by almost 50%. When smolt production increases, returns of small salmon are expected to be higher, unless there are corresponding decreases in marine survival to offset for the increased numbers of smolts.

Environmental conditions, harvests in various fisheries and conservation requirements for salmonids in Labrador, 2001

Authors: D. G. Reddin, R. Anthony, M. Andersen, and G. Andrew

Summary: Information was presented on catch statistics for Labrador in angling fisheries and aboriginal food fisheries in 2001 along with environmental data collected at gauging stations on selected rivers. Total return information was summarised from counting facilities. Total landings of 7,101 salmon and 18,770 kg were recorded for the food fisheries in Labrador. Landings recorded by the angling fishery were 1,367 small salmon retained, 3,286 small salmon released, 326 large salmon retained and 974 large salmon released. Labrador rivers were high in the spring and low throughout most of the summer. Low water continued well into the fall.

Comments:

Efforts should continue to increase the return rate of logbooks in angling and food fisheries in Labrador.

A study of by-catches in herring bait nets in Newfoundland, 2001

Authors: D. G. Reddin, R. Johnson and P. Downton

Summary: The effect of the bait fishery on returning Atlantic salmon and cod in inshore Newfoundland was investigated in 2001. Levels of by-catches were examined by analysing the license file for numbers of fishers and location, conducting a phone survey to determine how many fishers actively fished and what level of by-catches they experienced, fishing experimentally with bait nets and traditional herring nets, surveying catches in bait nets by Enforcement Staff and studying tag returns of repeat spawners from Campbellton River. Data from DFO Licensing Section indicated that there are about 3,600 licenced bait fishers in Newfoundland and Labrador. A phone survey of licensed bait net fishers indicated that about 46% actively fished for herring in 2001 and that bait was obtained principally for the lobster fishery followed by crab and cod. Experimental fishing was carried out in three locations and a total of six salmon, one sea trout and one smolt were caught. Numbers of salmon found during patrols in pelagic nets by Enforcement Staff and the numbers of salmon reported during herring index fishery were very low. Overall conclusions, based on the information presented, were that the legal fishery for herring to use as bait has a low incidence of salmon or cod being caught but that the by-catch of pollock might be important. By-catch can be reduced by controlling the sites fished, setting nets at least one fathom deep, and parallel to shore where possible. The setting of nets parallel to shore may increase the by-catch of pollock and will reduce the catch of herring.

Comments:

1. While the experimental fishery did take place when salmon were traditionally caught in the area based on catches in the former commercial fishery, fishing was not done throughout the entire run. In Charlottetown experiments, it is noted that low returns were experienced at the counting fence at Northwest River the nearest largest river. Low catches during the experimental fishery may have occurred because of low numbers of salmon in the area.
2. The phone survey of bait net fishers was done later in the season and similar to angler logbooks the information collected is based on the ability of people to remember specific events and numbers.
3. Surveys by Enforcement Staff are spot checks only and are not based on a rigorous experimental design.
4. Weaknesses in the data collection for this study suggest that similar information should be collected in future years.

Recommendations:

1. It is recommended that bait nets continue to be set at least one fathom deep in the water.
2. The requirement on the west coast of Newfoundland to set nets parallel to shore rather than perpendicular should be expanded to other areas of the province where and when practical to do so. However, Resource Managers should be aware that in some areas of the south coast setting nets parallel to shore will increase the by-catch of pollock and for all areas will decrease the catch of herring.
3. Also, there could be some sites where by-catches of salmonids are of concern and DFO Enforcement Staff should continue efforts to ensure that bait nets are kept away from areas of potentially high salmon abundance.

Since the need for bait is reduced by mid-June in most areas of the island of Newfoundland, requiring the removal of bait nets while salmon are running along the coast would appear to be potentially a very effective method for reducing salmonid by-catch further and should be considered.

**Rainbow Trout (*Oncorhynchus mykiss*) Investigations in Trout River,
Newfoundland, 2001**

Authors: C. C. Mullins and T. R. Porter

Summary:

- The results indicate that rainbow trout have established a small population in Trout River. This is the first confirmed rainbow trout population in Western Newfoundland.
- The length frequency distribution of rainbow trout collected on Trout River in 2001 indicates that they have successfully reproduced for several years. The length-weight relationship is also consistent with a feral population.
- The distribution of rainbow trout within the Trout River system appears to be restricted to Trout River Pond, the main-stem of Trout River downstream from Trout River Pond, and Feeder Brook, the first tributary (~1.0 km) upstream from the estuary. More intensive surveys to determine rainbow trout spawning locations and rearing areas may suggest reasons for this or reveal a wider distribution within the river system.
- Atlantic salmon and brook trout are also present throughout the Trout River system as well as other species.

Comments:

Habitat surveys combined with identification of rainbow trout, Atlantic salmon and brook trout spawning and rearing areas are needed to determine the extent to which rainbow trout coexist with other species.

ACKNOWLEDGEMENTS

Thanks are extended to all who participated at the March meeting, particularly those from outside DFO who gave up their own time to attend and contribute to the sessions. Dale Parmiter kindly assisted with co-ordinating the assessment meetings and contended with various formatting problems associated with the Salmon Stock Status Report (SSR).

APPENDIX 1

Newfoundland Region Salmonid Stock Assessment Meeting - 2001

Date: March 4 - 5, 2002
Location: Battery Hotel & Suites, Pegasus Conference Room
Time: 0900 – 1700 hrs

AGENDA

- 1 - Call to order
- 2 - Finalization of agenda
- 3 - Review of Newfoundland Region stock assessment documentation process with emphasis on the Stock Status Report
- 4 - Summary of atmospheric, marine and freshwater environmental conditions in 2001
- 5 - Atlantic salmon assessments
 - 5.1 Labrador (SFAs 1 – 2, 14B)**
 - 5.11 Environmental conditions, harvests and conservation requirements for salmonids in various fisheries in Labrador, 2001
 - 5.2 Newfoundland (SFAs 3 – 14A)**
 - 5.21 Overview of the status of Newfoundland salmon stocks
 - 5.22 Preliminary stock status of Atlantic salmon in Trout River
 - 5.23 Perspectives on smolt production and marine survival of Newfoundland salmon related to smolt size and run timing
 - 5.24 Trends in sea survival of repeat spawners with emphasis on Terra Nova River (withdrawn)**
- 6 - Other salmonid issues
 - 6.11 Rainbow trout in Trout River, Newfoundland: Preliminary results - 2001
 - 6.12 Summary of Brook trout recorded at counting facilities in Newfoundland rivers
 - 6.13 Results of parr movement studies in Spruce Pond - Experimental Ponds Area
 - 6.14 A study of salmon by-catches in herring bait nets in Newfoundland – 2001

- 6.15 Spatial and temporal variation in adult Atlantic salmon run timing – progress report on a Strategic Science initiative **(not presented)**
- 6.16 Overview of proposed smolt research and assessment work at Grand Falls, Exploits River
- 6.17 Overview of salmon enhancement activities at Terra Nova River
- 6.18 Comparative analysis of water quality above and below a fish counting facility at Campbellton River

7 - Items added to original agenda

- 7.1 Water temperatures in Bay St. George rivers during 2002 – possible impact on later salmon run timing
- 7.2 Status of Northwest River (Port Blandford) 2001
- 7.3 Pinchgut Brook – results of diving observations of salmon in the main stem of Harry's River
- 7.4 Predation on marine-phase Atlantic salmon by gannets in the northwest Atlantic
- 7.5 Additional information on by-catch of salmon in Newfoundland

8- Stock Status Report

9 - Other business

APPENDIX 2

List of individuals who participated, in whole or in part, at the March 2002 salmonid stock assessment meetings

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APPENDIX 3

List of working papers or other material provided at the assessment meeting

- Bourgeois, C. Terra Nova River – background information.
- Colbourne, E. Environmental conditions in the Northwest Atlantic during 2001 – a preliminary summary.
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APPENDIX 4

Summary Sheets

STOCK: **Exploits River (SFA 4)** **Drainage area:** 11,272 km²

CONSERVATION REQUIREMENT: 95.9 million eggs (equivalent to 56,670 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	30425	15263	27093	28802	12291	19665	4740	30425
Large	2057	881	1959	2236	684	1347	343	2236
Recreational harvest (small salmon)								
Retained	1915	2996	2019	2985	1384	2243	577	3072
Released	3202	2169	3168	2354	2673	1554	1145	3202
Recreational harvest (large salmon)								
Retained	-	-	-	-			0	83
Released	111	0	243	274	92	131	0	243
Broodstock removal								
	0	0	0	0	0	0	31	5111
Spawners ³								
Small	30192	12859	26647	27672	11261	18541	2326	30192
Large	28147	11978	24717	25468	10584	17207		28146
	2045	881	1930	2204	677	1334		2204
Fry Stocked								
	0	0	0	0			212610	6410426
Egg conservation requirement								
% met	69	24	49	47	22	34	6	69
Lower	210	72	146	134	64	98	34	210
Middle	43	15	35	35	16	27	8	43
Upper	26	10	6	7	2	5	0	119
¹ Min and max are for the period of record since 1974.								
² Preliminary								
³ No's of large and small salmon are unavailable prior to 1996								

Data and methodology: There are 35 million m² units of fluvial habitat and 34,000 ha of lacustrine habitat. Conservation egg requirements are to come from small salmon. Previous fry releases are backcalculated to eggs for % of conservation egg deposition achieved in areas stocked. Total returns to the river are based on the count at Bishop Falls fishway plus angling below the fishway.

Broodstock requirements: None at present.

Recreational catches: The 1998 - 2001 recreational fishery data on the Exploits River, is derived from the license stub return data.

State of the stock: Overall returns to the Exploits River, have improved during the moratorium years; however returns to the upper section of the watershed are extremely low and all efforts should be made to increase escapement to this section of the watershed.

Forecast: No quantitative forecast available

STOCK: **Campbellton River (SFA 4)** **Drainage area:** 296 km² (accessible)

CONSERVATION REQUIREMENT: 2.916 million eggs (~ 1,480 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	3208	1975	3275	3076	1798	2151	1975	4001
Large	560	321	402	493	208	119	145	560
Recreational harvest (small salmon)								
Retained	463	254	375	288	214	148	23	1547
Released	93	67	281	126	163	35	4	281
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	63
Released	31	9	8	22	47	10	0	31
Precocious post smolts	49	69	51	83	208	228	13	208
Spawners								
Small	2687	1645	2821	2692	1360	1772	1645	3675
Large	557	320	401	491	203	118	118	557
Egg conservation requirement								
% met	329	187	311	326	153	148	148	329
Smolt count	58369	62050	50441	47256	35596	37170	31577	62050
% Sea survival (corrected) (Adult return year)	7.15	2.25	4.88	5.03	3.66	5.35	2.25	7.23

¹ Min and max are for the period of record since 1974.
² Preliminary

Data and methodology: Smolts were enumerated at a counting fence. Returning adult salmon are enumerated at a fish counting fence with a video camera system. A hook-and-release mortality rate of 10% was used in the calculation of spawning escapements for the years 1993-00. Recreational data for 1997-00 were from the License Stub Return System and are preliminary. Sea survival is corrected to exclude previous spawners in the upstream migration. Previous spawners were estimated in 1999 from survival patterns in previous years. Egg conservation requirement met for 1996, 1997, 1998 and 2000 was calculated using average percent female and average whole weight, 1993-2000 due to the low number of samples obtained from the angling fishery.

State of the stock: Conservation requirements were met from 1993 to 2000.

Forecast: No forecast available.

STOCK: **Gander River (SFA 4)** **Drainage area:** 6,398 km²

CONSERVATION REQUIREMENT: 46.211 million eggs (21,828 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	23946	10599	18805	18491	14074	12517	6745	26205
Large	1753	1883	3649	4822	1942	1682	473	4822
Recreational harvest (small salmon)								
Retained	2974	1061	2543	2609	1253	2117	1061	4578
Released	1153	1007	2179	1061	649	1108	448	2179
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	13	927
Released	73	189	298	268	104	234	39	298
Spawners								
Small	20822	9437	16044	15776	12756	10289	5565	24739
Large	1746	1864	3619	4795	1931	1658	473	4800
Egg conservation requirement								
% met	124	62	110	119	86	81	36	128

¹ Min and max are for the period of record since 1974.

² Preliminary

Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: The number of small salmon retained in 2001 was 2117 (an increase of 69% from 2000) and the number released was 1108 compared to 649 in 2000.

Data and methodology: Complete counts of salmon were obtained at a fish counting fence during 1989-99, and have historically been counted at a fishway located on a tributary, Salmon Brook. Returns to the entire Gander River in 2000 and 2001 were estimated from relationships between counts at the Salmon Brook fishway and total returns to the counting fence for the period 1989-1999. Recreational fishery data for 1997-2001 are from the License Stub Return System; data for 2001 are preliminary. Data for large salmon for 1997 are incomplete. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2001.

State of the stock: Conservation requirement was not achieved in 2001. Conservation egg requirement was achieved in five of the ten moratorium years. Conservation requirement in terms of small salmon was met only in 1993. Using Salmon Brook as an indicator of returns to the entire river, it is likely that returns of small salmon of a magnitude similar to or greater than those in 1992-2001 occurred in pre-moratorium years.

Forecast: No forecast available.

STOCK: Middle Brook (SFA 5) **Drainage area:** 276 km²

CONSERVATION REQUIREMENT: 2.3 million eggs (~ 1,012 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	2112	1287	2549	1950	1746	1285	626	2549
Large	161	262	196	130	190	62	13	262
Recreational harvest (small salmon)								
Retained	476	77	188	183	107	134	28	789
Released	153	10	154	57	24	31	10	387
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	20
Released	0	1	17	16	22	2	0	37
Spawners								
Small	1605	1209	2345	1762	1636	1148	461	2345
Large	161	262	195	129	187	62	13	262
Egg conservation requirement								
% met	250	196	301	222	218	139	49	301

¹ Min and max are for the period of record since 1974.

² Preliminary

Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: A total of 134 small salmon was retained in 2001 and 31 were released.

Data and methodology: Complete counts are available from a fishway located on the lower river. Recreational fishery data for 1997 were obtained from a creel survey and 1998-2001 are from the License Stub Return System; data for 2001 are preliminary. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2001.

State of the stock: Conservation requirement in terms of eggs and small salmon was exceeded in the moratorium years 1992-2001. Egg deposition was below conservation requirement for pre-salmon moratorium years 1985-1991. Counts of small salmon similar to or higher than those observed during the moratorium years occurred in pre-salmon moratorium years.

Forecast: No forecast available.

STOCK: Terra Nova River (SFA 5)Drainage area: 1,883 km²

CONSERVATION REQUIREMENT: 14.3 million eggs (~ 7,094 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	2575	1800	1815	1892	1629	2230	1127	3050
Large	472	528	390	344	232	331	56	638
Recreational harvest (small salmon)								
Retained	896	296	146	120	137	168	85	896
Released	260	148	379	229	435	334	125	569
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	43
Released	113	10	32	10	65	10	10	113
Broodstock removal ³								
Small	225	352	270	239	132	254	64	352
Large	32	29	0	3	5	21	0	44
Spawners								
Small	1577	1137	1361	1543	1357	1821	815	2620
Large	429	498	387	340	221	309	56	587
Egg conservation requirement								
% met	36	32	32	33	27	36	14	53

¹ Min and max are for the period of record since 1974.
² Preliminary
³ In 1994-2001, a number of adults were removed as broodstock for an incubation facility for subsequent fry stocking back to Terra Nova River above Mollyguajeck Falls; these adults were deducted from spawning escapements and the calculation of percent of conservation requirement presented above.
Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: A total of 168 small salmon was retained in 2001 and 334 were released.

Data and methodology: Counts are available from a fishway located on the lower river. Returns to the river in 2000 were estimated based on the relationship between counts at the upper fishway and total returns to the the lower fishway for previous years. Recreational fishery data for 1997-2001 are from the License Stub Return System; data for 2001 are preliminary. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2001.

State of the stock: The proportion of conservation requirement achieved in 2001 was 36%. Although this river has never achieved conservation requirement, egg depositions during the moratorium years 1992-2001 were generally higher than in pre-moratorium years. It should be noted that accessible rearing habitat for anadromous Atlantic salmon above the lower fishway more than doubled in 1985 with the opening of the area above Mollyguajeck Falls.

Forecast: No forecast available.

STOCK: **Northeast Brook, Trepassey (SFA 9)** **Drainage area:** 21 km²

CONSERVATION REQUIREMENT: 0.14 million eggs (~ 51 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	73	50	91	95	83	56	49	158
Large	15	9	11	18	14	8	9	41
Recreational harvest (small salmon)								
Retained								
Released								
Recreational harvest (large salmon)								
Retained								
Released								
Spawners								
Small	73	50	91	95	83	56	49	158
Large	15	9	11	18	14	8	9	41
Egg conservation requirement								
% met	196	135	256	248	216	143	126	368
Smolt count								
	1749	1829	1727	1419	1740	916	792	1911
% Sea survival								
(Adult return year)	9.2	2.9	5.0	5.5	5.8	3.2	2.6	9.2
¹ Min and max are for the period of record since 1984.								
² Preliminary								

Data and methodology: Counts of adults and smolts have been available from a counting fence since 1984 and 1986. Up until a few years ago, this small system was part of a group of experimental rivers involved in research on stock-recruitment relationships and definition of smolt production in terms of various habitat types. The system has become an important indicator of smolt (year i) to (small salmon year i + 1) survival (repeat spawners included).

State of the stock: Conservation egg requirement has been met every year in the time series, but the lowest level achieved occurred in 1992. In terms of small salmon, the lowest percentage of conservation requirement achieved also occurred in 1992. The maximum number of smolts counted was 1,911 in 1991 while the lowest was 792 in 1995. Highest sea survival prior to the commercial salmon-fishing moratorium (8.1%) was recorded in 1987. Lowest survival (2.6%) occurred in 1992. Since the start of the moratorium in 1992, sea survival rose to a peak of 9.2% in 1996 only to plummet to 2.9% in 1997; an improvement over this low was noted for 1998-2000 but dropped again to 3.2% in 2001.

Forecast: No forecast available.

STOCK: **Rocky River (SFA 9)** **Drainage area:** 296 km²

CONSERVATION REQUIREMENT: 3.4 million eggs (~ 881 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	356	435	423	327	277	233	80	435
Large	45	89	130	77	104	60	1	89
Recreational harvest (small salmon)								
Retained								
Released								
Recreational harvest (large salmon)								
Retained								
Released								
Broodstock removal	0	0	0	0	0	0	0	76
Spawners								
Small	355	435	423	327	277	233	158	435
Large	45	89	130	77	104	60	1	89
Fry stocked	162231	0	0	0	0	0	81983	434500
Egg conservation requirement								
% met	34	56	54	39	34	33	17	56
Smolt count	14261	16900	12163	8625	7616	9392	5115	16900
% Sea survival (Adult return year)	2.8	2.2	1.8	2.9	2.1		1.8	4.2

¹ Min and max are for the period of record since 1987.
² Preliminary

Background: Rocky River was stocked with salmon fry from 1983 to 1987 with the first returns to the reconstructed fishway realized in 1987. Also in 1987 140 adult salmon were transferred into Rocky River from Little Salmonier River.

Data and Methodology: Fluvial habitat consists of 1.08 million m² and lacustrine habitat includes 2200 ha. Biological characteristics used in calculations are those for Rocky River stock. Previous fry releases are backcalculated to eggs for % of target egg achieved in areas stocked. Complete adult counts are available from a trap installed in the fishway. Smolts have been enumerated annually since 1990. Sea survival is smolt to 1SW salmon returns to the fishway.

Recreational fisheries: The recreational fishery is closed on this river.

State of the stock: Stock is still in the development phase.

Forecast: There is no forecast for 2001.

STOCK: Northeast River - Placentia (SFA 10) **Drainage area:** 94 km²

CONSERVATION REQUIREMENT: 0.72 million eggs (~ 224 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	1420	723	885	363	613	313	313	1420
Large	123	185	287	167	258	65	0	287
Recreational harvest (small salmon)								
Retained	268	95	201	67	114	56	19	349
Released	7	45	102	26	0	17	5	189
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	6
Released	0	33	23	8	9	5	0	33
Broodstock removal ³								
Small	-	31	51	43	31	39	31	51
Large	-	-	-	7	10	0	0	7
Spawners								
Small	1102	592	622	250	468	216	317	1102
Large	123	182	285	159	247	65	0	285
Egg conservation requirement								
% met	736	486	484	260	449	168	152	736

¹ Min and max are for the period of record since 1974.
² Preliminary
³ In 1997-2001 salmon were removed as broodstock for enhancement projects in Rennie River and Waterford River, St. John's, and for research purposes at the Ocean Sciences Centre.
 Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: In 2001, a total of 56 small salmon was retained and 17 were released.

Data and methodology: Counts are available from a fishway on the lower river. Counts of small and large salmon in 2001 were estimated using proportions of counts at the trap in previous up to July 14. Counting ceased on this date in 2001 due to a washout of the trap. Recreational fishery data for 1997-2001 are from the License Stub Return System; data for 2001 are preliminary. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2001.

State of the stock: Conservation requirement has been exceeded every year since 1984. The return of small salmon in 2001 was the lowest of the moratorium years.

Forecast: No forecast available.

STOCK: Conne River (SFA 11) Drainage area: 602 km²

MANAGEMENT TARGET: 7.8 million eggs (~ 4,000 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

CONSERVATION REQUIREMENT: 4.34 million eggs (~ 2,475 small salmon)

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to home waters								
Small	4440	3200	2931	2358	5177	1503	1533	10155
Large	179	185	295	241	216	140	89	516
First Peoples' harvest								
Small	0	514	0	0	0	0	0	948
Large	0	1	0	0	0	0	0	11
Recreational harvest (small salmon)								
Retained	-	197	-	-	730	215	108	3302
Released	-	80	-	-	-	-	0	80
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	27
Released	-	0	-	-	-	2	0	0
Broodstock removal								
Small	25	0	0	0	0	0	25	245
Large	0	0	0	0	0	0	0	1
Spawners								
Small	4402	2558	2926	2349	4431	1286	1286	7823
Large	179	182	294	240	216	140	87	488
Management Target								
% met	114	70	84	68	117	37	37	219
Egg conservation requirement								
% met	204	125	150	122	210	67	67	394
Smolt estimate								
	94088	100983	69841	63658	60777	86898	55765	100983
% Sea survival								
(Adult return year)	7.2	3.4	2.9	3.4	8.1	2.5	2.5	10.2
¹ Min and max are for the period of record since 1974. First Peoples' harvest in salt water includes some salmon from other rivers. First Peoples' fishery quota of 1200 fish has been in effect since 1986, but was reduced to 500 fish for 1993. First Peoples' fishery and recreational fishery were closed again in 1998 and 1999. ² Preliminary								

Data and methodology: Smolt estimates are derived from mark-recapture surveys. Returning adult salmon are enumerated at a fish counting fence. Angling harvests for Conne River are from DFO statistics. A video camera system was introduced in 1993.

State of the stock: The Management Target, which is higher than the conservation egg requirement, was met from 1986 to 1990 and again in 1996 and 2000. Only 37% of the target was achieved in 2001. Sea survival to small salmon decreased from 8.1% to 2.5%, the lowest value recorded. In contrast with the Management Target, the Conservation egg requirement was met or exceeded from 1986-1990, in 1993, and again from 1995 - 2000. This fell to only 67% in 2001.

Forecast: Based upon the point estimate of the number of smolts that migrated in 2001, a marine survival rate of 2.8% would be required in order for the conservation requirement to be attained in 2002, while a survival of 4.6% would be needed to meet the Management Target. Based upon the sea survival rates that have resulted over the past 14 years, and without any consideration of the trend for lower survivals during the past decade, the probability of achieving the above returns are 85% and 46%, for the conservation and management targets, respectively.

STOCK: Highlands River (SFA 13) **Drainage area:** 183 km²

CONSERVATION REQUIREMENT: 1.5 million eggs calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to home waters								
Small	199	398	96	146	58	75	58	398
Large	142	157	117	82	67	65	29	157
Recreational harvest (small salmon)								
Retained								
Released								
Recreational harvest (large salmon)								
Retained								
Released								
Spawners								
Small	199	398	96	146	58	75	58	398
Large	142	157	117	82	67	65	29	157
Conservation requirement								
% met	79	105	59	49	34	35	28	105
Smolt count	12383	6776	5922	9634	13120	-	5922	15839
% Sea survival								
Small	1.6	3.2	1.4	2.5	0.6	0.6	0.6	3.2
Large	1.4	1.3	0.9	1.2	1.1	0.7	0.4	1.4
	(Adult return year)							
¹ Min and max are for the period of record since 1974.								
² Preliminary								

Data and methodology: Counts of smolt and adult salmon were obtained with a fish counting fence in 1980 - 82 and in 1993 - 2000. Adults salmon only were enumerated in 2001. Sea survival is calculated for small salmon returning in year i + 1 and for large salmon returning in year i + 2, by dividing the number of returning adults by the number of smolts in year i.

State of the stock: The number of large salmon returning has increased since the closure of the commercial salmon fishery in 1992, but has fallen in each of the past four years since the peak in 1997. Small salmon returns are variable with returns in 2001 up 29% from the previous year. The conservation spawning requirement was achieved in only one year (1997). The conservation spawning requirement achieved in 2001 was 35%, similar to that in 2000.

Forecast: No forecast was made as smolts were not monitored in 2001.

STOCK:**Crabbes River (SFA 13)****Drainage area:** 551 km²**CONSERVATION REQUIREMENT:** 4.6 million eggs (spawners not defined) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	866	1152	491	712	1031	687	111	1916
Large	249	358	240	264	156	180	15	397
Recreational harvest (small salmon)								
Retained	-	3	-	-	-	-	26	561
Released	221	278	91	59	56	29	0	278
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	14	127
Released	96	119	55	18	43	39	0	119
Spawners								
Small	844	1121	482	709	1024	683	64	1355
Large	239	346	234	263	152	176	15	346
Egg conservation requirement								
% met	68	95	53	66	63	53 ³	3	95

¹ Min and max are for the period of record since 1974.
² Preliminary
³ Minimum

Data and methodology:

Visual counts of salmon were made by snorkellers in August, 1996 to 2001. Adjustment factors were applied to the visual counts to give an estimate of the total number of salmon in the river. Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock:

In 2001, at the time of the survey, Crabbes River had attained 53% of its egg deposition requirement for conservation. This estimate is considered to be a minimum estimate since there some salmon observed entering the river after the survey was conducted. However, it is unlikely that sufficient salmon entered the river after the survey to achieve the river's conservation egg deposition requirements. The estimated egg deposition in 2001 is slightly lower than the egg deposition level (63%) achieved in 20 and lower than the average level (69%) 1996-00. The number of small salmon, in 2001, is 19% lower than the average returns 1996-2000, and the number of large salmon is 30% below the average returns.

Forecast:

There is insufficient information available to forecast the abundance of Atlantic salmon in 2002.

STOCK:**Middle Barachois Brook (SFA 13)****Drainage area:** 241 km²**CONSERVATION REQUIREMENT:**2.1 million eggs (spawners not defined) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	825	1060	N/A	563	1145	934	134	1619
Large	40	190	N/A	62	1156	141	0	1159
Recreational harvest (small salmon)								
Retained	-	-	-	-	-	-	51	534
Released	195	158	6	14	31	3	0	195
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	117
Released	35	81	23	2	-	-	0	81
Spawners								
Small	805	1044	N/A	560	1142	934	83	1329
Large	36	182	N/A	66	155	141	0	1057
Egg conservation requirement								
% met	52	95	N/A	43	95	80 ³	9	254

¹ Min and max are for the period of record since 1974.
² Preliminary
³ Minimum

Data and methodology:

Visual counts of salmon were made by snorkellers in August 1996, 1997, 1999 to 2001. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river. Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock:

In 2001, at the time of the survey, Middle Barachois Brook had attained 80% of its egg deposition requirement for conservation. The estimate is 16 % lower than the egg deposition in 2000, but 13 % higher the average 1996-2000. The estimated egg deposition, in 2001, is considered to be a minimum estimate since some salmon may have entered the river after the survey was conducted, as evident from nearby rivers (Crabbes and Highlands).

Forecast:

There is insufficient information available to forecast the abundance of Atlantic salmon in 2002.

STOCK: **Robinsons River (SFA 13)** **Drainage area:** 439 km²

CONSERVATION REQUIREMENT: 3.3 million eggs (spawners not defined) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	866	1077	N/A	1431	1560	1972	274	3186
Large	137	190	N/A	204	329	223	21	733
Recreational harvest (small salmon)								
Retained	5	3	4	2	204	144	3	905
Released	926	571	468	434	634	518	0	926
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	210
Released	168	184	114	41	127	43	7	184
Spawners								
Small	768	1017	N/A	1399	1293	1776	158	2281
Large	120	172	N/A	200	316	219	21	604
Egg conservation requirement								
% met	67	91	N/A	118	135	142 ³	9	174

¹ Min and max are for the period of record since 1974.
² Preliminary
³ Minimum

Data and methodology:

Visual counts of salmon were made by snorkellers in August 1996, 1997, 1999 to 2001. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river. Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock:

In 2001, at the time of the survey, Robinsons River had attained 142% of its egg deposition requirement for conservation. The estimate is the highest since 1981. There has been an increasing trend in population size since 1993. In 2001 the egg deposition is 38% higher than the average egg deposition 1996-2000. The estimated egg deposition, in 2001, is considered to be a minimum estimate since some salmon may have entered the river after the survey was conducted, as evident from nearby rivers (Crabbes and Highlands).

Forecast:

There is insufficient information available to forecast the abundance of Atlantic salmon in 2002.

STOCK: Fischells Brook (SFA 13) **Drainage area:** 360 km²

CONSERVATION REQUIREMENT: 3.6 million eggs (spawners not defined) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	N/A	797	215	1264	1834	214	42	1800
Large	N/A	86	72	246	277	44	0	455
Recreational harvest (small salmon)								
Retained	315	182	17	-	34	-	17	374
Released	232	162	36	-	3	0	0	162
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	66
Released	150	127	4	-	7	-	0	150
Spawners								
Small	N/A	599	194	1264	1800	210	25	1800
Large	N/A	73	72	246	276	43	0	415
Egg conservation requirement								
% met	N/A	44	23	110	142	19 ³	1	142

¹ Min and max are for the period of record since 1974.
² Preliminary
³ Minimum

Data and methodology: Visual counts of salmon were made by snorkellers in August each year 1997 to 2001. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river. Angling data are from the License Stub Return System. The River was closed to angling in 1999 and 2000. A 10% hook-and-release mortality was assumed.

State of the stock: In 2001, it is estimated that, at the time of the survey, Fischells Brook had only attained 19% of its egg deposition requirement for conservation. This estimate is considered to be a minimum estimate since some salmon may have entered the river after the survey was conducted, as evident from nearby rivers (Crabbes and Highlands). However, it is unlikely that sufficient salmon entered the river after the survey to achieve the river's conservation egg deposition requirements. The estimated egg deposition in 2001 is the lowest recorded since surveys began in 1997.

Forecast: There is insufficient information available to forecast the abundance of Atlantic salmon in 2002.

STOCK: Flat Bay Brook (SFA 13) Drainage area: 635 km²

CONSERVATION REQUIREMENT: 3.8 million eggs (spawners not defined) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	1233	1307	N/A	2263	2321	1134	179	2308
Large	132	173	N/A	235	471	199	5	477
Recreational harvest (small salmon)								
Retained	-	-	-	-	154	138	0	609
Released	-	253	131	264	334	1081	0	442
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	0	59
Released	-	57	89	37	50	257	0	112
Spawners								
Small	1051	1282	N/A	2237	2134	952	107	2237
Large	112	167	N/A	231	466	173	1	466
Fry stocked	127200	149555	0	0	0	0	56059	149555
Egg conservation requirement								
% met	85	89	N/A	149	167	71	4	167
¹ Min and max are for the period of record since 1974. ² Preliminary ³ Minimum								

Data and methodology:

Visual counts of salmon were made by snorkellers in August each year 1996 to 2001. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river. Angling data from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock:

In 2001, at the time of the survey, Flat Bay Brook had attained 71% of its egg deposition requirement for conservation. The estimate is 57% lower than the estimate for 2000, and 42% below the average returns 1996-2000. The decline in escapement was evident in both the large and small salmon. The estimated egg deposition, in 2001, is considered to be a minimum estimate since some salmon may have entered the river after the survey was conducted, as evident from nearby rivers (Crabbes and Highlands)

Forecast:

There is insufficient information available to forecast the abundance of Atlantic salmon in 2002.

STOCK:**Harry's River (SFA 13)****Drainage area:**816 km²

CONSERVATION REQUIREMENT: 7.8 million eggs calculated as
fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ²	MIN ¹	MAX ¹
Total returns to river								
Small	1974	1718	1625	1672	1264	1007	864	1982
Large	137	198	187	176	48	130	15	198
Recreational harvest (small salmon)								
Retained	34	2	-	-	-	-	2	1008
Released	1196	591	288	286	730	307	23	1196
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	1	68
Released	206	139	95	53	72	29	0	206
Spawners								
Small	1820	1657	1596	1643	1191	976	518	1827
Large	116	184	177	171	41	127	12	184
Egg conservation requirement								
% met	52	50	49	49	29	33	12	52
Spawners on Pinchgut Brook tributary								
Small	601	613	593	608	441	200	200	749
Large	38	68	63	63	15	3	3	68

¹ Min and max are for the period of record since 1974.
² Preliminary
Note: Any changes from previous reports are due to the updating of preliminary data and biological characteristics information.

Recreational catches: The fishery has been limited to catch and release angling since 1996. The numbers of small and large salmon released in 2001 were 58% and 60%, respectively, lower than in 2000 but this may have been due to inseason closures due to low water levels.

Data and methodology: Counts of small and large salmon were obtained at a fish counting fence operated on Pinchgut Brook tributary in 1992-2001. Spawners on Harry's River were derived from spawning escapements above the counting fence adjusted for the percentage of the total spawning activity observed on Pinchgut Brook tributary during surveys conducted in the fall of 1995-1997. Recreational fishery data for 1996-2001 are from the License Stub Return System; data for 2001 are preliminary. Estimates of total returns and total spawners in 2001 include 466 small and 88 large salmon that were counted in a snorkel survey of the mainstem on 16 August 2001. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2001.

State of the stock: The conservation requirement was not achieved in 2001, but the percent met was 14% higher than in 2000, the second lowest since 1992. The stock has shown some signs of improvement since 1992 with increased juvenile densities and proportion of large salmon but it has been at most 52% of the conservation requirement. The low water levels experienced in recent years, incidence of poaching and the unknown effects of forest spraying and other human activity in the area create continued

Forecast: No forecast available.

STOCK: **Lomond River (SFA 14A)** **Drainage area:** 470 km²

CONSERVATION REQUIREMENT: 1.1 million eggs (~ 658 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ³	MIN ¹	MAX ¹
Total returns to river²								
Small	982	1300	766	1179	1047	660	259	1365
Large	98	77	128	123	89	77	3	128
Recreational harvest (small salmon)								
Retained	371	490	201	335	368	310	158	650
Released	99	273	226	148	209	171	24	273
Recreational harvest (large salmon)								
Retained	-	-	-	-			2	34
Released	49	52	23	97	80	50	2	97
Known removals above fishway								
Small	0	0	1	10	3	0	0	22
Large	0	0	1	3	0	0	0	3
Spawners								
Small	601	783	541	819	655	333	1	983
Large	93	72	125	110	81	72	0	125
Egg conservation requirement								
% met	143	161	151	181	140	88	31	187

¹ Min and max are for the period of record since 1974.
² Total returns are approximate because of spawning below the fishway.
³ Preliminary.
 Note: Any changes from previous reports are due to the updating of preliminary data and biological characteristics information.

Recreational catches: The river quota that was in place since 1986 was dropped in 1999. Overall, the recreational catch in 2001 was lower than in 2000. The number of small salmon retained and released in 2001 was 16% and 18% lower than in 2000, respectively. The number of large salmon released in 2001 was 38% lower than in 2000.

Data and methodology: Returns to the river above the fishway are determined from counts at the fishway and recreational catch data below the fishway. With the exception of 1968-1970 and 1989-1991 the fishway has been monitored since 1961. Recreational fishery data for 1997-2001 are from the License Stub Return System; data for 2001 are preliminary. A hook-and-release mortality of 10% was used in the calculation of spawning escapements for the years 1985-2001.

State of the stock: The conservation requirement above the fishway was not achieved in 2001, the first time since 1992. The percent met was 37% lower than 2000. Returns of small salmon in 2001 were 37% lower than in 2000. Returns of large salmon in 2001 were 13% lower than in 2000. The area above the fishway represents about 40% of the total river area. Using the area above the fishway as an indicator, Lomond River did not achieved its conservation requirement in 2001.

Forecast: No forecast available.

STOCK: **Torrent River (SFA 14A)** **Drainage area:** 619 km²

CONSERVATION REQUIREMENT: 1.5 million eggs (~ 656 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ³	MIN ¹	MAX ¹
Total returns to river²								
Small	7371	4033	5329	4545	4135	2633	96	7371
Large	509	674	766	416	595	445	7	766
Recreational harvest (small salmon)								
Retained	421	327	275	477	340	372	31	477
Released	270	469	552	603	315	449	75	603
Recreational harvest (large salmon)								
Retained	-	-	-	-	-	-	2	34
Released	20	79	89	174	80	76	0	174
Spawners								
Small	6923	3659	4999	4008	3762	2216	121	6923
Large	507	666	757	399	587	437	3	757
Egg conservation requirement								
% met	1279	797	924	680	657	400	161	1279

¹ Min and max are for the period of record since 1974.

² Total returns are approximate because of spawning below the fishway.

³ Preliminary.

Note: Any changes from previous reports are due to the updating of preliminary data and biological characteristics information.

Recreational catches: The restriction of hook-and-release angling only until a minimum spawning escapement of 750 salmon had passed through the fishway was dropped in 1999. Catches and have increased over time with the highest values occurring since 1992. The number of small salmon retained and released in 2001 was 9% and 43% , respectively, higher than in 2000. The number of large salmon released in 2001 was slightly lower than in 2000.

Data and methodology: Returns to the river above the fishway are determined from counts at the fishway and recreational catch data below the fishway. The fishway has been monitored since 1966. Recreational fishery data for 1997-2001 are from the License Stub Return System; data for 2001 are preliminary. A hook-and-release mortality of 10% was used in the calculation of spawning escapements for the years 1985-2001.

State of the stock: The conservation requirement was achieved above the fishway in 2001, but the percent met was 39% lower than in 2000. Returns of small and large salmon in 2001 were 36% and 25%, respectively, lower than in 2000. Returns to Torrent River have shown an increasing trend since the late 1970s with the highest returns occurring since 1992. It is estimated that the Torrent River stock has achieved conservation requirement every year since 1978. This is due to the successful enhancement program carried out in 1972-1976 when adult salmon were used to colonize above the fishway.

Forecast: No forecast available.

STOCK: **Western Arm Brook (SFA 14A)** **Drainage area:** 149 km²

CONSERVATION REQUIREMENT: 0.91 million eggs (~ 292 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 105 eggs/ha

Year	1996	1997	1998	1999	2000	2001 ³	MIN ¹	MAX ¹
Total returns to home waters								
Small	1230	509	1718	1046	1492	563	233	1718
Large	50	55	128	22	120	28	0	128
Recreational harvest (small salmon)⁴								
Retained	-	-	-	-	21	24	0	171
Released	-	-	-	-	0	0	-	-
Recreational harvest (large salmon)								
Retained	-	-	-	-	0	0	0	2
Released	-	-	-	-	0	0	0	2
Known removals above counting fence								
Small	41	1	68	1	3	6	0	223
Large	2	0	0	0	0	0	0	3
Spawners								
Small	1189	508	1650	1045	1468	533	117	1650
Large	48	55	128	22	120	28	0	128
Egg conservation requirement								
% met	415	200	625	370	567	193	30	625
Smolt count								
	14502	23845	17139	13500	12706	16013	5735	23845
% Sea survival ²								
(Adult return year)	8.1	3.0	6.6	6.1	11.0	4.4	2.1	12.0

¹ Min and max are for the period of record since 1974.

² Sea survival is from smolt to 1SW salmon returns in year of adult return.

³ Preliminary

⁴ Biological sampling by angling

Note: Any changes from previous reports are due to the updating of preliminary data and biological characteristics information.

Recreational catches: The river has been closed to angling since 1989. The angling that took place in 2000-2001 from the mouth of the river to 0.5km upstream was part of a biological sampling experiment. The purpose of this experiment was to collect biological information from up to 100 small salmon.

Data and methodology: Counts of smolts and adult salmon were obtained at a fish counting fence located at the mouth of the river in 1971-2001. A hook-and-release mortality of 10% was used in the calculation of spawning escapements for the years 1985-89 when there was a recreational fishery.

State of the stock: The conservation requirement was achieved on the river in 2001. The percentage met was 66% lower than in 2000 and the second lowest since 1992. Returns of small salmon in 2001 were 62% lower than in 2000 and the third lowest since 1992. Returns of large salmon were 77% lower than 2000. In spite of continued high egg depositions since the commercial fishery moratorium, smolt production has not increased in recent years.

Forecast: The smolt production in 2001 was 26% higher than in 2000. Hence, assuming that sea survival remains constant, returns of small salmon in 2002 are expected to be higher than in 2001. Given the extreme variability in smolt sea survival in recent years, there is some uncertainty in this expectation.