Fisheries and Oceans Canada Pêches et Océans Canada
Science Sciences

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Canadian Science Advisory Secretariat **Secrétariat canadien de consultation scientifique**

Proceedings Series 2009/026 **Compte rendu 2009/026**

Proceeding of the Newfoundland and Labrador Region Salmonid Stock Assessment Meeting

Compte rendu de l'évaluation des stocks de salmonidés de la Région de Terre-Neuve et du Labrador

November 6-7, 2008
St. John's, NL

Les 6 et 7 novembre 2008
St. John's, T.-N.L.

Meeting Chairperson
C. Bourgeois

Président de la réunion
C. Bourgeois

Fisheries and Oceans Canada / Pêches et Océans Canada
Science Branch / Direction des science
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October 2009 **Octobre 2009**

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings include research recommendations, uncertainties, and the rationale for decisions made by the meeting. Proceedings also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Avant-propos

Le présent compte rendu a pour but de documenter les principales activités et discussions qui ont eu lieu au cours de la réunion. Il contient des recommandations sur les recherches à effectuer, traite des incertitudes et expose les motifs ayant mené à la prise de décisions pendant la réunion. En outre, il fait état de données, d’analyses ou d’interprétations passées en revue et rejetées pour des raisons scientifiques, en donnant la raison du rejet. Bien que les interprétations et les opinions contenus dans le présent rapport puissent être inexacts ou propres à induire en erreur, ils sont quand même reproduits aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considéré en tant que reflet des conclusions de la réunion, à moins d’indication précise en ce sens. De plus, un examen ultérieur de la question pourrait entraîner des changements aux conclusions, notamment si l’information supplémentaire pertinente, non disponible au moment de la réunion, est fournie par la suite. Finalement, dans les rares cas où des opinions divergentes sont exprimées officiellement, celles-ci sont également consignées dans les annexes du compte rendu.

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ISSN 1701-1272 (Printed / Imprimé)
ISSN 1701-1280 (Online / En ligne)

Published and available free from:
Une publication gratuite de :

Fisheries and Oceans Canada / Pêches et Océans Canada
Canadian Science Advisory Secretariat / Secrétariat canadien de consultation scientifique
200, rue Kent Street
Ottawa, Ontario
K1A 0E6

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Correct citation for this publication:
On doit citer cette publication comme suit :

DFO. 2009. Proceedings of the Newfoundland and Labrador Region Salmonid Stock Assessment Meeting; November 6-7, 2008. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2009/026.

MPO. 2009. Compte rendu de la réunion d'évaluation des stocks de salmonidés de la région de Terre-Neuve et du Labrador ; les 6 et 7 novembre 2008. Secr. can. de consult. sci. du MPO, Compte rendu 2009/026.

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SUMMARY

The sixteenth annual Salmonid Stock Assessment Meeting (Regional Assessment Process (RAP)) for the Newfoundland and Labrador Region was held in St. John's, NL, 6 - 7 November 2008. An update was provided on the status of Atlantic salmon stocks in Newfoundland and Labrador, with specific assessments on 21 rivers monitored in 2008. Data were presented on the adult salmon returns and estimates of the percent of the conservation egg deposition achieved in 17 rivers in insular Newfoundland and four rivers in Labrador. Estimates of smolt production were provided for five rivers in Newfoundland and one in Labrador. Trends in smolt and adult salmon production, and at-sea survival were provided with comparisons to pre- and post- closure of the commercial salmon fisheries. Estimates of the harvest of salmon in the angling and food fisheries were presented. In general egg deposition increased in 2008 over 2007 in almost all rivers; the percent survival of the 2007 smolt-class to small salmon returns in 2008 was among the highest recorded. There was a discussion on the deficiencies of data on the biological characteristics for salmon populations in Bay St. George rivers; as well, as an update of the radio telemetry studies at Conne River and Little River. There was a presentation on the exploitation of salmon in the angling fishery, and on the compilation of a list of salmon rivers in Newfoundland and Labrador. There were three presentations related to brook trout. One related to an angler characteristics and attitudinal survey pertaining to management preferences on the Avalon Peninsula; a second, provided an assessment of the brook trout stock in Jonathan's Pond: and the third was a risk assessment and modelling response to exploitation in the recreational fisheries. A presentation was made on research being conducted on the distribution of brown trout in Newfoundland. The presentations were reviewed and discussed by participants from DFO, NL Provincial Department of Environment and Conservation, Parks Canada Agency, and stakeholder groups.

SOMMAIRE

La seizième réunion annuelle d’évaluation des stocks de salmonidés (Processus d’évaluation régional) de la Région de Terre-Neuve et du Labrador a eu lieu à St. John’s, T.-N.L., les 6 et 7 novembre 2008. On a présenté une mise à jour de l’état des stocks de saumon atlantique de Terre-Neuve et du Labrador ainsi que les évaluations de 21 cours d’eau ayant fait l’objet d’une surveillance en 2008. On a présenté des données sur la montaison des adultes ainsi que des estimations du pourcentage de la ponte nécessaire pour assurer la conservation dans 17 cours d’eau de la partie insulaire de Terre-Neuve et de 4 cours d’eau du Labrador. Des estimations de la production de saumoneaux dans 5 cours d’eau à Terre-Neuve et dans 1 cours d’eau au Labrador ont aussi été fournies. On a en outre présenté les tendances relatives à la production de saumoneaux et de saumons adultes ainsi qu’à la survie en mer en comparant les périodes antérieures et postérieures à la fermeture de la pêche commerciale au saumon. Des estimations des prélèvements de saumon dans le cadre des pêches à la ligne et de subsistance ont été fournies. En général, la ponte a augmenté dans presque tous les cours d’eau en 2008 comparativement à 2007; le pourcentage de survie des saumoneaux de 2007 au moment de la montaison de 2008 a été l’un des plus élevés enregistrés. On a tenu des discussions sur les lacunes dans les données concernant les caractéristiques biologiques des populations de saumons des cours d’eau qui se jettent dans la baie St. George ainsi qu’une mise à jour sur les études par radiotélémétrie menées dans la rivière Conne et la rivière Little. Un exposé sur l’exploitation du saumon par les pêcheurs à la ligne et sur l’élaboration d’une liste de rivières à saumons à Terre-neuve et au Labrador a été présenté. Trois exposés ont traité de l’omble de fontaine. L’un d’entre eux portait sur une étude des caractéristiques et des comportements des pêcheurs à la ligne dans un contexte de gestion sur la presqu’île Avalon; le deuxième traitait d’une évaluation du stock d’omble de fontaine dans le secteur de Jonathan’s Pond; le troisième portait sur une évaluation du risque et sur les résultats d’un exercice de modélisation de scénarios de pêche récréative. Un exposé a aussi traité d’une recherche menée sur la répartition de la truite brune à Terre-Neuve. Parmi les participants qui ont passé en revue les exposés et qui ont tenu des discussions sur ceux-ci, mentionnons des représentants du MPO, du ministère provincial de l’Environnement et de la Conservation de T.-N.L., de l’Agence Parcs Canada ainsi que de groupes d’intervenants.

INTRODUCTION

The sixteenth annual Regional Assessment Process for Salmonids for the Newfoundland and Labrador Region was held at the Clovelly Golf Course, 6-7 November 2008 to review information on the status of Newfoundland and Labrador Salmonid stocks. The Terms of Reference is provided in Appendix 1 (English) and Appendix 2 (French). The Agenda for the meeting is Appendix 3. The meeting participants included representatives from: Department of Fisheries and Oceans (DFO) Science, Policy and Economics, and Fisheries and Aquaculture Management branches, Government of Newfoundland and Labrador, Parks Canada Agency, Aboriginal groups, Memorial University of Newfoundland, salmonid conservation organisations, and aquaculture industry. A list of attendees is provided in Appendix 4.

This Report provides, for each presentation, a summary, a synopsis of the discussion and recommendations. Summary sheets for the salmonid stocks assessed are in Appendix 5.

Complete details of the data and methodologies used in the assessments are published in the Canadian Science Advisory Secretariat (CSAS) Research Document series, while the overall report on the status of stocks is contained in the CSAS Science Advisory Report 2009 for the Newfoundland Region. CSAS Publications are available in Portable Document Format (PDF) at http://www.dfompo.gc.ca/csas/Csas/Home-Accueil_e.htm.

SUMMARY OF PRESENTATIONS

1. Returns to rivers in Labrador and harvests of salmonids in various fisheries, 2008

***PRESENTER*:** *D. G. Reddin, Department of Fisheries and Oceans Canada*

SUMMARY: In 2008, returns of anadromous fishes to four rivers were enumerated at counting fences, and harvests of salmonids in the food and angling fisheries were recorded (preliminary). The angling data for 2008 were not available at the time of this presentation. The 2007 data have been updated for the food and recreational fisheries.

In 2008, a total of 414 small and 50 large salmon returned to English River. When compared to 2007, the returns of small salmon had declined by 17% while returns of large salmon had increased by 56%. When compared to the previous 6 year mean, small and large salmon returns increased by 46% and 56%, respectively. A total of 495 small and 35 large salmon returned to Southwest Brook (Paradise River). When compared to 2007, small salmon had increased by 63%, while there was no change (<10%) in returns of large salmon. When compared to the previous 6 year mean, small salmon returns increased by 19% while large salmon returns had not changed (<10%). A total of 474 small and 36 large salmon returned to Muddy Bay Brook (Dykes River). When compared to 2007, there was an increase in returns of small salmon by 98% and large salmon by 157%. When compared to the previous 6 year mean, returns of small and large salmon increased by 32% and 80%, respectively. A total of 4,842 small and 795 large salmon returned to the main stem of Sand Hill River, (exclusive of Northwest Tributary). Returns of small and large salmon increased by 50% and 15%, respectively, compared to 2007. When compared to the previous 6 year mean, small salmon returns increased by 14%; whereas, large salmon increased by 21%. The four monitored rivers achieved their conservation reference levels (190 eggs per m^2) in 2008.

The total landings in the four fisheries for Food, Social and Ceremonial (FSC) or subsistence purposes, including the bycatch of salmon in the resident trout fishery, was 26 t in 2007, which is a slight decline from the 2006 landings (landings for 2008 are unavailable at time of meeting).

The angling catches (retained and released), in Labrador in 2007, decreased for small and large salmon from 2006. Angling catch and effort rates, in 2007, are similar to 2006. The catch rate, however, is on an increasing trend since 1991.

COMMENTS:

- There continues to be a great deal of concern about the status of salmon stocks in Labrador rivers particularly in Lake Melville where there is high fishing effort in the food fisheries.
- One participant indicated that many groups have recommended no harvest of large salmon in Labrador. What is Science's recommendation? The response was that Science advises that the current levels of the large salmon stocks are low and that caution should be exercised in allowing a harvest of large salmon.
- More research is required on large salmon populations in Labrador to determine if the few rivers that are monitored rivers are representative of populations in other rivers. Also more studies are required to determine why populations of large salmon are not increasing.
- There was a discussion regarding the low water levels in 2006 and whether or not there were any noticeable effects on salmon production. It is too early to see any effects on smolt on adult salmon production. Any effect may or may not be detected in adult salmon production; since the Atlantic salmon returns in any year consists of multiple year-classes, which may counter act any negative effect in any one year.
- The abundance of large salmon is influenced by the number and genetic characteristics of spawners, and environmental conditions. The interaction of the environmental conditions and genetics is not clearly understood. More research is required.
- There was a discussion on the effects of the fisheries, genetics, and the environment on the low numbers of large salmon in Labrador. The low abundance appears to be related to more than just the fisheries; more research is required to determine the contribution of environmental and genetic affects on production.
- Retention of large salmon was permitted in Scheduled Salmon Rivers in SFA 1 & some rivers in SFA 2.
- The Arctic charr food fishery has a higher harvest than the Atlantic salmon food fishery harvest. The total landings of Arctic charr are unavailable.
- Does the size of the Atlantic salmon and Arctic charr stocks fluctuate in phase? Current data does not indicate that the annual fluctuations are in phase, which is understandable since Atlantic salmon and Arctic charr generally occupy different spawning and feeding habitats in-river. Their marine habitats are also different. Thus, changes in environmental conditions may not be similar for both habitats. There is insufficient data to determine if the two species respond similarly to the same environmental perturbations.
- Salmon were seen, by Provincial Wildlife staff, in the Ikarut River, in northern Labrador. A discussion ensued as to whether or not the range of Atlantic salmon had extended northward. There was no documentation that a range extension had occurred. The Notakwanon River is generally sited as the most northerly river with spawning population of Atlantic salmon. There are sporadic observations of Atlantic salmon in rivers further north, but no known established populations. Subsequent to the meeting one participant indicated that there is an established population in a river in Webb's Bay, which is north of Notakwanon River.

RECOMMENDATIONS:

1. *Every effort should be made to reduce the harvest of large salmon.*
2. *More research is required on large salmon populations, in Labrador, to determine if the four rivers that are monitored rivers are representative of populations in other rivers.*
3. *Studies are required to determine why populations of large salmon are not increasing.*

2. Returns to Insular Newfoundland Rivers, Smolt production and marine survival trends

PRESENTER*: *C. Bourgeois, Department of Fisheries and Oceans Canada

SUMMARY: The commercial Atlantic salmon fishery moratorium, implemented in insular Newfoundland in 1992, entered its 17th year in 2008. Low marine survival, since the late 1980's, continues to be the major factor affecting overall abundance of Atlantic salmon within the insular portion of the region. Inter-annual variation in marine survival continues to fluctuate widely as evidenced by the marine survival of the 2007 and 2008 returns. Overall mean sea survival of the five monitored rivers of the 2007 smolt class was amongst the highest values observed (1971-2008). Conservation egg deposition was achieved on 13 of the 19 assessed rivers; of the six rivers that did not achieve conservation four were rivers with newly opened habitat (Exploits, Terra Nova, Northwest and Rocky rivers) while Middle Barachois and Little rivers failed to achieve conservation egg deposition requirements. Overall there was a large increase in returns of small salmon over 2007 and compared to the 1992-2007 mean. Returns of large salmon improved, in most rivers over 2007, with numbers being close to the 1992-2007 mean. Returns of small salmon (SFA's 3-14A) in 2008 increased in 14 of 15 assessed rivers over 2007 (no assessments for 4 rivers in Bay St. Georges for 2006 and 2007) and increased in 17 of 19 assessed rivers compared to the post moratorium mean (1992-2007). Smolt output for the five monitored rivers increased over the 2007 with the 2008 smolt output being some of the highest values observed. Concern is expressed for Middle Barachois Brook, the one river of the five assessed in SFA 13 that did not meet conservation egg deposition. It is recommended that Science Branch and Fisheries and Aquaculture Management Branch conduct investigations to identify the possible causes with a goal to increase the egg deposition.

COMMENTS:

- There was a discussion on the genetic and environmental influence on determining the proportion of large salmon within a population (i.e. determining age at maturity). It was generally agreed that genetics and environment influenced age at maturity. These factors also played a role in determining influence on the survival of repeat spawners.
- One participant commented that there were many grilse on the Gander River that are >63 cm and asked if these should be harvested? It was pointed out that the genetics of a salmon as well as environmental conditions do interact to influence growth. Currently we do not know if these fish are genetically different than the smaller grilse. It is difficult to get the appropriate information to determine the contribution of genetics and environment to growth.
- The egg deposition contribution of repeat spawners was discussed and some participants suggested that this contribution should be evaluated. It maybe low.
- Previous workshops have indicated that forestry activities had a serious negative impact on salmon production in Bay St. George rivers. The new proposed forest management plan proposes to harvest a large portion of several watersheds. This activity may have a very serious impact on future salmon production, particularly in Harry's River. A participant indicated that DFO, particularly Science Branch, does not appear to be playing an active role in reviewing and inputting into the Plan. Non-governmental organizations (NGO's) were asked to

forward their concerns to Oceans and Habitat Branch of DFO. The Chair indicated that Science Branch would contact Oceans and Habitat Branch on the issue.

- The spawning stock on Middle Barachois Brook is at a seriously low level (28% of C.L.). Some participants recommended that there be no human induced mortality on this stock (currently a part of this river is open to hook-and-release fishing). There was no consensus on this recommendation since some participants felt that allowing hook-and-release anglers on the river would discourage poaching and thus resulted in fewer salmon illegally harvested. Note: DFO Science does recommend no human induced mortality on stocks below 100% conservation egg deposition.
- Some participants felt that throughout NL the salmon stocks are at seriously low levels and that there should be no increase in harvest and where the spawning stocks are below 100% of the conservation egg deposition, there should be no harvest. There was no consensus on this issue.
- There was considerable discussion on the interpretation of the meaning of "*Conservation egg deposition requirements".* Participants felt that documentation of the meaning should be brought to the next meaning.
- Some participants felt that fisheries management should take a more precautionary approach; whereby the management reference level should be higher than the Conservation Level. The Conservation level in terms of egg deposition is used as the minimum level of egg deposition, below which there should be no harvest of salmon. A higher reference level would reduce the risk of not achieving the conservation egg deposition on rivers. There was no consensus on this issue.
- Science needs to be more specific in their recommendations.
- The total returns of Atlantic salmon to NL were low in 2007, followed by a relatively high abundance in 2008. This phenomenon appeared to be global in nature. Scientists should look for signals in the environmental data that may have contributed to this phenomenon.

RECOMMENDATIONS:

1. *The salmon stock on Middle Barachois Brook is at a seriously low level; and, it appears to be declining. Additional effort needs to be taken to prevent further decline and rebuild this population. Consideration should be given to again engaging the community in an action plan to rebuild Middle Barachois salmon population. Conservation and Protection staff should be informed of the serious status of the salmon population in Middle Barachois Brook and that it may require a concerted effort to minimize illegal harvest.*
2. *Research needs to be conducted on the genetic component of large salmon and repeat spawners. This research is required to determine if management objectives are achievable.*
3. *The definition and interpretation of conservation level and management reference level be brought forward to the next meeting.*
4. *The contribution of egg deposition by repeat spawners should be evaluated.*
5. *No harvest should be permitted when the spawning stock is less than 100% of the Conservation level.*

3. Biological Characteristics Bay St. George Atlantic Salmon

PRESENTER: *G. Veinott, Department of Fisheries and Oceans*

SUMMARY: Accurately estimating the biological characteristics (length, weight, sex ratio, fecundity) of a salmon population is essential in estimating the egg production; and hence, the sustainability of that population. However, there is a gap in our knowledge of the biological characteristics for many of the Bay St. George river populations especially with regard to multi-sea winter (MSW) or large (≥63 cm) salmon. The Bay St. George area is unique because it produces most of insular Newfoundland's MSW fish. River specific data are the most appropriate data to use; but, when river specific data have not been available the average characteristics from adjacent rivers or published data have been used. River specific fecundity data for the area are the most lacking especially on MSW fish. One solution is to collect data on more salmon from more rivers. Currently, Harry's River is the only river in Bay St. George where there is an ongoing sampling program. However, fecundity data for MSW fish requires sacrificing the animal, which is undesirable, given the generally low overall population of MSW fish. Therefore, it is likely that for the near future fecundity data for MSW fish will be estimated from published values.

COMMENTS:

- The primary concern is the uncertainty about the appropriateness of the current estimates of fecundity for small and large salmon in Bay St. George rivers.
- If the estimate for fecundity, which is currently used in the assessments, is increased, there will be a corresponding increase in the estimates of egg deposition, given no change in the other biological characteristics used in the derivation of egg deposition. There was considerable discussion on this point. However it was the general feeling that the best and most appropriate scientific data should be used and that the management implications should not negate using the best scientific data.
- There was considerable discussion about the sparse amount of biological characteristic data for salmon in Bay St. George rivers and the importance of getting more data, given that these rivers contain most of the MSW salmon populations in NF; and, the salmon populations are at very low levels.
- It is important to collect additional river specific biological characteristics data; however, some participants felt that since populations were at low levels the present snorkel surveys, used to estimate stock size, should not be discontinued. The time series on spawning escapement is important in making stock recovery plans and should not be discontinued in order to free up resources to collect biological characteristics data.
- It is unlikely that additional fecundity data will be collected for MSW salmon in Bay St. George rivers since lethal sampling would be required, and the size of the populations are low.
- Where river specific data are available, such as 1SW salmon on Harry's River and fecundity on Flat Bay Brook, these data should be used. Currently the default values for weight, length, and percentage female are derived from salmon stocks in Bay St. George. The default value for the fecundity parameter is developed from rivers outside Bay St. George. It was suggested that these default values continue to be used until more appropriate data are available to calculate default values.
- The best estimate for fecundity for 1SW fish may be the average of all data that are available for all Newfoundland rivers.
- Although, 63 cm is the reference measurement used to separate 1SW and MSW salmon, some of the early run 2SW salmon in Bay St. George are <63 cm.
- It was pointed out that the biological characteristics of salmon differ throughout the run and sampling should take this into account.
- The egg quality of different sea-age salmon may differ. However, no information is currently available to quantify any differences; so this factor is not taken into account in the stock assessments.
- There was a discussion regarding the appropriateness of using risk assessment in presenting estimates of percentage conservation levels achieved. Previously when risk assessments were used, there was a lot of confusion in the interpretation and how to incorporate the output in fisheries management. Fisheries managers preferred to use point estimates.

- It was agreed that a Working Paper will be presented at the 2009 RAP documenting and recommending the parameters used in calculating egg deposition for each of the Bay St. George rivers.

RECOMMENDATIONS:

1. *River specific biological characteristics data, when available, should be used in stock assessments. In the absence of river specific data, the most appropriate scientific data should be used.*
2. *River specific biological characteristics data should be collected.*
3. *Prepare a working paper on the appropriate estimates of biological parameters to be used in calculating egg deposition in Bay St. George rivers and present at the next meeting.*

4. Acoustic tagging and tracking of Atlantic salmon – Bay d'Espoir - 2008

PRESENTER: *J. B. Dempson, Department of Fisheries and Oceans*

SUMMARY: In many areas of the north Atlantic, populations of Atlantic salmon are either in a state of decline or even extirpated such that concern over the continued survival of the species has been given more attention in recent years. It is commonly believed that factors responsible for the decline operate in the marine environment, particularly during the critical period when salmon first go to sea. In order to address this issue an acoustic telemetry study was initiated at Bay d'Espoir in 2006. Thus, for the past three years (2006–08) Atlantic salmon smolts and kelts have been tagged with acoustic transmitters and released from Conne River during April and May. The objectives were to determine movements and migration patterns throughout the Bay d'Espoir fiord, and obtain insight into the initial survival and residency time of both life history stages and compare patterns across years.

In 2008, 30 smolts and 8 kelts were tagged at Conne River and 28 Vemco VR2 receivers were positioned at various locations throughout Bay d'Espoir. This year several receivers were located in more distant areas outside of the Bay d'Espoir fiord. Extended areas included Dragon Bay (west of McCallum), Round Harbour (south coast of Long Island) and several positioned along the Connaigre peninsula past Hermitage.

Besides Conne River salmon, smolts from Little River have also been tagged and released over the past two years.

All Conne River kelts that were tagged and released were subsequently accounted for. Three (3) kelts returned to Conne River after an absence of 57 to 73 days. Several kelts were tracked migrating into the North Bay arm of the Bay d'Espoir fiord. Analysis of data compiled over the past three years indicates that while there some differences in the annual migration route, the differences were not statistically significant. Thus, most kelts (77.4%) migrate out of Bay d'Espoir via Lampidoes Passage.

With respect to Conne River smolts, in 2008, half of the tagged fish provided no data. At least one smolt was tracked out to Dragon Bay and several migrate up into the North Bay arm. Similar to the kelts, there were no significant differences in the migration route over the three years with most of smolts (54.3%) leaving by way of Lampoides Passage. There was no significant difference in the size of smolts that were successfully tracked versus those for which no data were obtained and thus likely represent mortalities. The migration route of Conne River smolts differed significantly from that of out migrating kelts.

Little River smolts differed from the Conne River smolts in that most (78.8%) migrate out through the main channel of the Bay d'Espoir fiord. At least six smolts were tracked out to Dragon Bay and four down along the Connaigre Peninsula (Halfway Point/Western Cove). As observed with Conne River smolts, Little River smolts were also tracked up into the North Bay arm of the fiord. Last year it was observed that Little River smolts took noticeably longer to migrate to the outer areas of the Bay d'Espoir fiord by comparison with Conne River smolts. In 2008, Conne River smolts were found to have taken about a week longer to reach the outer fiord than the previous year, while Little River smolts timing was similar to 2007.

Collectively, results suggest that the outer areas of the Bay d'Espoir fiord that includes the North Bay arm are important staging areas for smolts and kelts prior to fish undertaking any open sea migration.

COMMENTS:

- There was a discussion on why post-smolts and kelts spend time in outer Bay d'Espoir. What is happening there? There are reports of a high abundance of krill in this area. Is this a location where high mortality of Conne River salmon occurs? Cod fish and other predators are known to frequent this area. Appears to be a highly productive area.
- There is uncertainty as to why there were more undetected tags from Conne River than Little River, in 2008.
- There was no evidence of smolts staging in proximity to the aquaculture cages.
- There was no evidence of a sea lice problem on wild smolts in Bay d'Espoir. No indication of sea lice on aquaculture fish in inner Bay d'Espoir. Sea lice problems occur in the aquaculture sites in the outer portion of the Bay. Incidents of sea lice infections do not generally occur until water temperatures exceed 6^oC. Temperatures in outer Bay d'Espoir do not exceed 6^oC until sometime in June.
- There was annual variability in the length of time that post-smolts staged in Bay d'Espoir.
- No tagged kelt from Conne River were detected swimming through the Strait of Belle Isle.

RECOMMENDATIONS:

1. *Conduct an investigation to determine if there is high post smolt mortality occurring in the outer Bay d'Espoir area.*

5. Angler characteristics and attitudinal data pertaining to management preferences for the Avalon Peninsula

PRESENTER: *R. Perry, Government of Newfoundland and Labrador, Department of Environment and Conservation*

SUMMARY: A summary of results from a survey, conducted in the spring of 2007, that targeted brook trout anglers who fished the Avalon Peninsula was presented. In total, 1400 surveys were mailed to randomly chosen anglers in 81 communities. There were 548 respondents. The mean age of respondents was 56 years, and the average time individuals reported fishing on the Avalon was 36.38 years. In general, the survey results indicate that anglers are motivated to go fishing primarily for relaxation and to spend time with family members. Catch related motivations ranked second in importance. When considering catch related motivations, anglers who fish the Avalon, prefer to catch a few fish to eat and place less importance on the size of their catch. Fishing solely for "catch and release" was given the least importance.

Respondents felt that the quality of the brook trout fishery had declined during the past ten years but that this decline was not serious enough to warrant changing the current regulations. The majority of respondents felt that the current daily bag limit of 12 fish plus one was appropriate and disagreed with the suggestion of a bag limit reduction. The majority of respondents did feel that the Avalon Peninsula should have a separate management zone. When asked how many times anglers had been approached by conservation officers while fishing the majority reported they had never been approached. The vast majority of statements written in the comments section indicate that anglers feel enforcement for the brook trout fishery is inadequate and that this is creating resource abuse and disregard for regulations.

A research document is currently being drafted explaining the findings. The document will be submitted to undergo the Department of Fisheries and Oceans Sciences (DFO) peer review process for inclusion in the DFO Science Advisory Report.

COMMENTS:

- The author felt that no recommendations should be brought forward to increase restrictions on the trout fishery since anglers appear to be satisfied with the current angler catch rate and size of fish, even though the anglers believe that fishing is not as good as it was 5-10 years ago.
- Anglers indicated that 50% of the time they catch their bag limit.
- Most anglers have never encountered a Fisheries Officer while angling trout. This is suggestive that the level of enforcement on trout angling on the Avalon Peninsula is low.
- The surveys will be down graded in the future since anglers are not interested in change.
- The questions asked in the present survey reflect the angling fishery on the Avalon Peninsula and not necessarily the fisheries in other areas of Newfoundland.
- Number of anglers appears to be declining over time.

RECOMMENDATIONS:

No recommendations on this agenda item.

6. Risk assessment and modeling population responses to exploitation in recreational fisheries

PRESENTER: *B. Adams, Government of Newfoundland and Labrador, Department of Environment and Conservation*

SUMMARY: A stochastic life history model was developed and tested for brook trout (*Salvelinus fontinalis*) using data from 16 lakes in eastern Canada. Monte Carlo re-sampling was combined with a population matrix model to create probability distributions of intrinsic rates of increase (*r*). These probability distributions were then used to assess the impact of environment perturbations, primarily, increased adult mortality as a consequence of recreational fishing. From 2004–08 simulated exploitation was used in 8 of the 16 lakes to test the predictive power of the model. Population rates of change in the exploited and control lakes were congruent with model predictions. Abundance, density, age and size structure, and growth rate responses were in qualitative agreement with model predictions. Simulations of alternate recreational fishing management regimes suggest that under moderate to high exploitation rates a minimum size is the most effective method of ensuring long-term population persistence in short-lived salmonids. This modeling approach appears to be a robust method, even in data poor scenarios to assess population responses to exploitation at both the lake and regional scale.

COMMENTS:

- Considerable discussion took place on the use of a minimum size limit for trout. The model provided an estimate of the probability of success of achieving a management objective by implementing specific fisheries restrictions.
- The model can be run with any different management option: such as variation in length of season, slot limits, minimum size for retention etc.
- A minimum size limit will generally increase the numbers of large fish in a water body; and thus, increase the size of the fish in the anglers catch and improve angling quality. Also, a minimum size will increase the probability that a fish will spawn before it dies.
- Many, but not all anglers, release trout <6 inches.
- If the angling fishery selects fish before they mature, then there will be selective pressure for fish to mature at a younger age, and at a smaller size.
- There was a discussion on different management options and their effects on size structure of the population and on angling quality.
- The model was developed for freshwater fishes.

RECOMMENDATIONS:

No recommendations on this agenda item.

7. Stock assessment of the Brook Trout Fishery for the Jonathans Brook Watershed, Central Newfoundland.

PRESENTER*: *D. Keefe, Government of Newfoundland and Labrador, Department of Environment and Conservation

SUMMARY: The findings of research conducted on brook trout and the angling fishery on Jonathans Brook Watershed, Central NF, was presented. Information was gathered through a spring index netting program (2004 and 2005), roving winter creel surveys (2004-08), spawning surveys and an angler social survey. Based on length at sexual maturity data collected, a minimum size limit (230 mm) is recommended for brook trout in this system, subject to public consultation. A research document is currently being drafted explaining the findings. The document will be submitted to undergo the Department of Fisheries and Oceans Sciences (DFO) peer review process for inclusion in the DFO Science Advisory Report.

COMMENTS:

- The survey data indicates that many anglers on Jonathans Pond did not catch their bag limits. One participant, of this meeting, indicated that the aboriginal guardians conducted angler surveys on Jonathans Pond, and it appeared that anglers were under reporting their catches. The surveys on Jonathans Pond, in the present study, were also by staff in the field and they were confident that the reported catch represented the actual catch.
- The brook trout populations in ponds in the Jonathans Brook system are not in danger of collapse; but a minimum retention size would increase angler success, in terms of size of fish.
- There was a discussion on slot limits. The point was made that there needs to be a wide range in fish ages and lengths for slot limits to be effective and not severely impact on angling success, in terms of numbers of fish.
- Fishing pressure appears to be the main cause of the decline in numbers at age. Fishing exploitation is having about 20% effect on survival.
- When exploitation is high, a minimum size retention limit is most effective.

RECOMMENDATIONS:

1. *Prepare a Research Document on the stock status of brook trout in Jonathans Pond with recommendations for regulatory changes.*

8. Report on the Atlantic salmon rivers of Newfoundland and Labrador

PRESENTER: *D. G. Reddin, Department of Fisheries and Oceans*

SUMMARY: The number and size range of Atlantic salmon rivers was recently reviewed as part of DFO's initiatives to develop a Canadian Stock Status Report on Atlantic salmon in Eastern Canada. A salmon river for purposes of this report was defined as one that has a viable reproducing Atlantic salmon population, has records of salmon presence through indirect or direct observation such as angling statistics and was larger then 15 km^2. Records used to determine salmon rivers included angling statistics collected by Fisheries & Oceans, records from field staff, such as Salmonids Section and Fish Habitat Management personnel and Fishery Officers, and information from Aboriginal groups. Candidate rivers were chosen from geographic information maps of the province. In total, 305 salmon rivers out of a total of 364 on the Island of Newfoundland were identified as salmon rivers along with a further 89 salmon rivers out of a total of 366 rivers in Labrador. In Labrador, efforts are underway to update the list by Aboriginal groups, which should be finalized in the new year. At present, but subject to further review, the Newfoundland & Labrador Region has 394 salmon rivers plus those that may be identified in the future in Labrador.

COMMENTS:

- Participants were pleased to see that a comprehensive list is being compiled. It will be good to have a public list of rivers that shows Scheduled versus non-scheduled rivers.
- The Notakwanon River was used as the northern most river containing Atlantic salmon. Subsequent to the meeting one participant indicated that there is an established population in a river in Webb's Bay, which is north of Notakwanon River.
- The Salmonid Council of Newfoundland and Labrador also has a list of salmon rivers compiled. D. Hustins indicated that he would provide a copy of the info to D. Reddin.
- The list of rivers only pertains to anadromous Atlantic salmon.
- The list should be a "living" document" that indicates the last date modified.
- The river name used in the list is the official name reported in the Gazetteer of Canada. In the absence of a listing in the Gazetteer, a local name was used. All rivers were identified by latitude and longitude.
- The original listing of rivers in Newfoundland (NF) and numbering system was initiated by Murray and Harmon, 1969 (FRB Tech Report # 130. 405 p).
- There was a discussion on Scheduling of Atlantic salmon rivers. It is apparent that some Scheduled rivers have smaller salmon stocks then some rivers that are not Scheduled. Criteria need to be developed for the Scheduling of rivers. Scheduling of rivers would be best discussed at a meeting with Fisheries Management.
- It would be useful to have a similar list for Arctic charr rivers.

RECOMMENDATIONS:

1. *DFO should consider the list of rivers to be a living document that could and should be updated as more information becomes available. The document should include the date of the last update.*
2. *A manuscript listing Atlantic salmon rivers in Newfoundland and Labrador should be prepared and submitted to the CSAS Research Document Series.*

9. Exploitation Trends in the Newfoundland Angling Fishery

***PRESENTER*:** *D. G. Reddin, Department of Fisheries and Oceans*

SUMMARY: Exploitation rates can be tracked in the Newfoundland angling fishery by dividing the angling catch (small salmon retained) by the total returns to a river determined at a fish counting facility. Exploitation rates are important as they define the resource use in various fisheries. In Newfoundland, estimates of exploitation have declined from approximately 30% in the 1980s to around 15% in the 2000s. This decline is similar to the decline in the number of anglers which has also declined by approximately 50%. There is also a link to the Salmon Management Plan which attempted to control exploitation in the 1990s after closure of the commercial fishery. While the exploitation rate did continue to decline the total utilization of salmon as expressed as a catch rate which included hook and released fish showed a big increase in the later 1990s.

COMMENTS:

- Only retained salmon were used in the analysis.
- Catch rates were relatively constant since 1996. It would be desirable to conduct analysis for the period after 1996.
- Participants felt that the increase in catch-and-release of angled salmon may be confounding any analysis comparing catch rate and abundance.
- How accurate are the catch rates? The total returns are relatively accurate; however, the catches are estimates and it is not known how representative they are to the actual catch. The estimates of catch are believed to have the same precision each year; therefore, the trend in the estimates of catch rates over time should be valid.
- Management changes that occurred since 1992 were intended to limit catch and to reduce catch rates. These restrictions include: retention of salmon per angler; river classification strategy; and, encouragement of hook-and-release angling.
- There has been a decline in the number of anglers fishing for salmon, which may confound the analysis. There are fewer younger anglers.
- The mortality associated with hook-and-release is about equivalent to 50% of the retained catch. If these numbers were added to the retained catch, it would reduce the downward slope of the decline in fishing mortality rate. It would be useful to consider including hooked-and-released salmon in the analysis.
- How does the exploitation rate on salmon compare to the exploitation rate on cod? Information was not readily available to make this comparison. However, the exploitation on salmon during the commercial salmon fishery was 60% or more. This rate was obviously too high.
- In 1992, the number of rod days initially increased, but the catch rate declined. This decline is probably related to the management plans implemented in 1992.

RECOMMENDATIONS:

No recommendations on this agenda item.

10. Distribution at sea of Atlantic salmon kelts

No presentation was available.

11. Contemporary evolution of introduced brown trout (*Salmo trutta*) populations in Newfoundland

PRESENTER*: P. A. H. Westley,* Ocean Sciences Centre Memorial University of Newfoundland

SUMMARY: Exotic brown trout were introduced to the waters surrounding St. John's, Newfoundland, beginning in 1883 (ending in 1906). Novel environments, well beyond the site of initial introductions, have been colonized by straying anadromous individuals. Little is known about how invasive brown trout are using habitat, where they are distributed on insular Newfoundland, and the interactions occurring with native fishes, such as brook trout and Atlantic salmon. Even less is known about the evolutionary consequences of these introductions and subsequent colonization events. As a first step in this project, we set out in the summer of 2008 to investigate among populations differences in presumably adaptive traits and to initiate steps to disentangle the genetic and environmental influence on trait expression. Twenty-three watersheds were sampled throughout the Avalon Peninsula and four off the Peninsula in Trinity Bay. Brown trout were found in high densities in 16 watersheds. Analyses quantifying size, shape, and colour are on-going; but, initial visual inspection of photographs of individuals among populations indicate dramatic differences in morphology, shape, and colour. Similarly, patterns of length frequency histograms among populations indicate variation in life history diversity and/or variable recruitment dynamics.

The initial steps to investigate the genetic and environmental underpinnings of these observed trait differences and the logic behind so called "common garden" experiments were discussed. Current research includes capturing adults from a subset of populations and rearing their offspring at the laboratory in Logy Bay. The results of among population differences observed in the field will be emerging this winter and spring; and, results of the common garden experiment are expected in the fall of 2009.

COMMENTS:

- If Brown trout spawning populations are isolated then genetic divergence could occur, which could affect the phenotypic traits.
- Coloration and body shape maybe environmentally induced differences; also these traits may have a genetically selective advantage. Current investigations may be able to determine the contribution of environment and genetic selection.
- There was a discussion as to whether or not the populations sampled were established. The presence of multiple year-classes would suggest that they were established, but further work is required to establish certainty.
- What is the homing fidelity of a fish in a non-maturing year? From other species there is some indication that some fish may utilize a stream that it is not its natal stream in non-maturing years.
- The brown trout is an invasive species and appears to be dispersing in a NE and SW direction from the NE Avalon area. An invasive species may have to displace a resident species and be exposed to a range in environmental conditions. Several generations may have to occur before the species can be considered established.
- Do fish caught at Witless Bay and in Salmon Cove Brook have origin in these rivers; and, are they of larger size because they are genetically different or is this environmentally controlled? Data are not yet available to answer these questions.
- Populations in Trinity Bay have probably been isolated from populations in Placentia Bay for many years.

- There are no early records of where brown trout were stocked, as there were for rainbow trout. There is some suspicion that brown trout were stocked outside the St. John's area. Thus some of these populations may not have dispersed from the St. John's area.
- Earlier fish culture in NF may have resulted in several crosses of donor strains.

RECOMMENDATIONS:
No recommendations on this agenda item.

12. Application of Dual Identification Sonar (DIDSON) for salmon counting in Newfoundland & Labrador

PRESENTER**:** *D. G. Reddin, Department of Fisheries and Oceans*

SUMMARY: There is a problem doing stock assessments on large rivers, particularly in Labrador, where there are many rivers with large drainage basins; but, no techniques to accurately enumerate the number of salmon in them. Typical tools such as counting fences will usually not work on a large river due to the depth of the water and volume of water. In British Columbia, Alaska and Washington states, sonars have long been used for estimating returns to large rivers. Due to their high initial cost and lack of ease of use they have never been used extensively on salmon rivers in Eastern Canada. Recently, a Dual Frequency Identification Sonar (DIDSON) has become available with improved sonar technology to the point where it is reasonably inexpensive, easy to use and accurate. Two DIDSONs purchased by Fisheries & Oceans were tested on four rivers in 2008: Campbellton and Salmonier on the island, and Eagle and Sand Hill in Labrador. At Campbellton River, 76 salmon kelts were individually released from a smolt trap and all 76 were observed by the DIDSON. Further testing occurred at both Sand Hill River for smolts and Salmonier River for extended windows use. At Eagle River, a site with reasonable characteristics for operation and counting, was chosen for the operation of the DIDSONs in 2009. Characteristics included no milling salmon, the least amount of acoustic noise, and appropriate bottom profile.

COMMENTS:
- The DIDSON sonar seems promising for monitoring large rivers like the Eagle River, Labrador. It would be desirable to have additional units for use on large rivers in Newfoundland, such as Humber and Gander rivers, if future testing in Labrador proves successful.
- It would be best to use a traditional fish counting fence on rivers, if it can be successfully operated. The DIDSOM only provides an estimate of numbers of fish; and, it requires staff present 24 hour-7 days a week for its operation due to potential problems with software, electrical malfunctions, adjustments to the angle of the sonar with fluctuation in water levels, and for security of the expensive equipment.
- Fluctuating water levels will require adjustments to angle and possibly location.
- A short fence is required to ensure fish are funnelled into the viewing area of the sonar. It is also required to protect the sonar equipment from being damaged by debris.
- The fence on the Eagle River would have to operate from mid-June to the end of September. It will be exposed to extremes in water level.
- David Reddin and Science Branch's senior management are commended for their efforts and foresight in acquiring and testing the sonar counter on larger rivers.

RECOMMENDATIONS:
1. *DFO support assessment projects on large rivers in Labrador, particularly Eagle, with the DIDSON sonar.*

2. *If the DIDSON sonar proves successful in Labrador, consideration should be given to using the technology on large rivers in Newfoundland, such as the Humber and Gander rivers.*

13. Report by the Bay St. George and Harry's River Working Groups

PRESENTER: *G. Veinott, Department of Fisheries and Oceans, on behalf of S. Styles, Bay St. George and Harry's River Salmon Working Groups.*

SUMMARY*:* The report provides an overview of 2008 activities and provides background information on the Bay St. George (BSG) stewardship group and historic trends of returns of salmon to Harry's River noting the increase in returns starting in 2000. There were reports by anglers of good returns on all BSG rivers in 2008. The report disputes DFO population assessment for Harry's Rivers and attributes this to: 1) uncounted fish in tributaries; 2) additional returns after August 6 when the counting fence was removed; and 3) angler reports. The report states that there has been an increase in the number of anglers; and, this has led to increased returns because anglers deter poaching. A history of the stewardship group was presented. There is a general belief that there has been an increase in enforcement, which also has led to a decline in poaching and improved stock recovery. The report discusses the impact that the stewardship group's lobbying has had on DFO's salmon management plan. The report states that the group believes the salmon returns to Harry's river is large enough that they will be recommending to DFO management that the retention limit on Harry's River should be increased to six salmon with no size restriction. The group also supports the "pass the rod" regulation. A history of DFO salmon management changes was provided. The report ends with a review of the Harry's River data including a list of the daily counts from the Gallants counting facility for 2008.

COMMENTS:

- There was no consensus at the meeting that the allowable harvest on Harry's River should be increased. The estimated spawning population of salmon has only been above the conservation reference level in two of the past five years. The conservation level should be above the reference level for a longer period of time. There is too much uncertainty about the genetic importance of the large salmon spawners to support a directed harvest at this time.
- There was a discussion on using the Harry's River Conservation Working Group model to address the conservation problem on Middle Barachois Brook. It was noted that a similar community involvement model was used for all Bay St. George rivers. However, there may be merit in considering re-initiating a community stewardship program for Middle Barachois with some modifications to focus on particular problems unique to Middle Barachois Brook.
- The problem of declining population on Middle Barachois may be related to issues other than illegal fishing. Although illegal fishing may still be a contributing factor.

RECOMMENDATIONS:

No recommendations on this agenda item.

Update Pre-COSEWIC meeting Atlantic Salmon – Feb. 2009

COSEWIC will be reviewing the status of Atlantic salmon stocks in Canada in 2010. DFO is required to table, at this review, all the relevant information on the status of Atlantic salmon stocks. DFO is organising a pre-COSEWIC meeting to review the status of Atlantic salmon. The following points were discussed:

- A pre-COSEWIC meeting has been organised, for the week of 10-15 February, 2009, in Halifax to review the status of Atlantic salmon stocks in Canada; particularly to look at the long-term trends in population size (30 yrs).
- The meeting will be open to DFO and non-DFO people by invitation. Non-DFO invitees will be provincial government representatives, stakeholder including aboriginal groups and academia.
- The first 2 days of the meeting will be devoted to a scientific review of the methodologies used to determine stock status. The following 2 days will be open to non DFO participants.
- Blair Adams and David Cote will be compiling a scientific document on the status of Atlantic salmon in Canada.

Manuscripts for upgrade to Research Document and Science Advisory Report

The following manuscripts were identified for upgrade:

1. Stock assessment of Newfoundland and Labrador Atlantic Salmon (Science Advisory Report)
2. Status of Atlantic salmon stocks in Newfoundland (Research Document)
3. Status of Atlantic salmon stocks in Labrador (Research Document)
4. Compendium of salmon rivers in Newfoundland and Labrador (Research Document)
5. Angler characteristics and attitudinal data pertaining to management preferences for the Avalon Peninsula (R. Perry) (Research Document)
6. Stock assessment of the Brook trout fishery for the Jonathans Brook Watershed, Central Newfoundland – D. Keefe (Research Document)

ACTION ITEMS

1. Science Branch is to contact Oceans and Habitat Branch regarding the proposed Forest Management Plan for Bay St. George area and its potential for negative impacts on the salmonid resource.
2. NGO's are to forward their concerns regarding the Forest management Plan to Oceans and Habitat Branch of DFO.
3. The definition and interpretation of conservation level and management reference level be brought forward to the next meeting of RAP.
4. Prepare a working paper on the appropriate estimates of biological parameters to be used in calculating egg deposition in Bay St. George rivers and present at the next meeting.
5. D. Hustins is to provide to D. Reddin, a copy of the list of salmon rivers that the Salmonid Council of Newfoundland and Labrador has compiled.
6. Prepare Science Advisory Report and Research Documents as identified above.

Other Business

The only other business was a report prepared by the Bay St. George and Harry's River Working groups, which was tabled by G. Veinott. A Summary of the report, comments and recommendations are in Item 14) above.

Appendix 1: Terms of Reference

Meeting of the Newfoundland and Labrador Regional Advisory Process (RAP) on Salmonids November 6-7, 2008

Stymies Meeting Room, Clovelly Golf Course, Stavanger Drive St. John's, Newfoundland and Labrador

Meeting Chairperson: Chuck Bourgeois, Section Head, Salmonids, Aquatic Resources Division, DFO, Newfoundland and Labrador Region.

TERMS OF REFERENCE

Background

There are 15 Atlantic salmon (*Salmo salar*) management areas, known as Salmon Fishing Areas (SFAs) 1-14B, in Newfoundland and Labrador. 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. This year marks the second year of a five-year Atlantic salmon management program. The November meeting is intended primarily to update those stocks/rivers considered during the last assessment meeting, with emphasis on determining the level of conservation spawning requirement achieved.

Objectives

An update of any new information available concerning the status of Atlantic Salmon stocks will be presented for Salmon Fishing Area (SFA)[1] regions as follows:

- Labrador: SFAs 1-2, 14B
- Newfoundland: SFAs 3-14A

The meeting will focus on the general state of salmon stocks in Newfoundland and Labrador and identify conservation issues. Harvests will also be assessed as part of the stock status assessment for Labrador. Detailed assessments of individual rivers will not be carried out. Rather, regional overviews of the status of stocks will be tabled. Finally, an update on smolt production and marine survival of Newfoundland salmon will be presented.

Products

A Science Advisory Report, Proceedings Report and associated Research Documents will be produced as a result of this meeting.

[1] There are 15 Atlantic salmon (*Salmo salar L.)* management areas know as Salmon Fishing Areas (SFAs) 1-14B in Newfoundland and Labrador. See CSAS Science Advisory Report 2007/055, Figures 1 and 2 for illustration: http://www.dfo-mpo.gc.ca/CSAS/Csas/status/2007/SAR-AS2007_055_E.pdf.

Invited Participants

DFO Science, Fisheries Management, Policy & Economics and SARA Program
Government of Newfoundland and Labrador
Parks Canada
Various Non-Governmental Organizations and Associations
Various Aboriginal Groups
Memorial University of Newfoundland
Various Salmon Working Groups
Various Aquaculture Groups

Appendix 2 : Cadre de référence

Réunion du Processus de consultation scientifique régional
Région de Terre-Neuve et du Labrador Salmonidés, Les 6 et 7 novembre 2008

Salle de réunion Stymies, Club de golf Clovelly, Stavanger Drive
St. John's, Terre-Neuve et Labrador

Président de la réunion : Chuck Bourgeois, chef de section, salmonidés, Division des ressources aquatiques, MPO, Terre-Neuve et Labrador.

CADRE DE RÉFÉRENCE

Contexte

On dénombre 15 zones de gestion du saumon atlantique (*Salmo salar*), désignées zones de pêche au saumon (ZPS) 1 à 14B, à Terre-Neuve et au Labrador. Ces zones comptent plus de 200 cours d'eau dans lesquels on a signalé des populations de saumons atlantiques qui se différencient par les caractéristiques de leur cycle biologique, y compris la durée de leur séjour en eau douce, l'âge au premier frai et l'étendue de leurs migrations dans l'océan. Cette année marque la deuxième année d'un programme quinquennal de gestion du saumon atlantique. La réunion de novembre vise principalement à faire le point sur l'état des stocks et des cours d'eau examinés lors de la dernière réunion d'évaluation et à déterminer la mesure dans laquelle on est parvenu à satisfaire les besoins en reproducteurs pour la conservation.

Objectifs

Présenter toute nouvelle information disponible concernant l'état des stocks de saumons atlantiques pour les zones de pêche au saumon (ZPS)[2] suivantes :

- Labrador : ZPS 1-2, 14B;
- Terre-Neuve : ZPS 3-14A.

La réunion portera sur l'état général des stocks de saumons dans la région de Terre-Neuve et du Labrador et sur la détermination des besoins pour la conservation. On évaluera également les prélèvements par la pêche dans le cadre de l'évaluation de l'état des stocks du Labrador. On n'examinera pas les cours d'eau individuellement, mais on présentera plutôt des examens régionaux de l'état des stocks. Enfin, on fera le point sur la production de saumoneaux et la survie en mer des saumons de la région de Terre-Neuve.

Produits

Un avis scientifique, un compte rendu et des documents de recherche connexes seront produits à la suite de cette réunion.

[2] On dénombre 15 zones de gestion du saumon atlantique (*Salmo salar L.*), désignées zones de pêche au saumon (ZPS) 1 à 14B, à Terre-Neuve et au Labrador. Voir les figures 1 and 2 dans l'avis scientifique du SCCS 2007/055 : http://www.dfo-mpo.gc.ca/CSAS/Csas/etat/2007/SAR-AS2007_055_F.pdf.

Participants invités

MPO : secteur des Sciences; Gestion des pêches; Politiques et économie; Programme de la LEP
Gouvernement de Terre-Neuve et du Labrador
Parcs Canada
Diverses associations et organisations non gouvernementales
Divers groupes autochtones
Université Memorial de Terre-Neuve
Divers groupes de travail sur les salmonidés
Divers groupes responsables de questions liées à l'aquaculture

Appendix 3: Agenda

Agenda - Atlantic Salmon 2008 Stock Status Update
November 6 -7 commencing at 9:00 am
Stymies Meeting Room, Clovelly Golf Course,
Stavanger Drive, St. John's

Day 1

0900 – Introduction (Bourgeois)
-review of agenda
Rapporteur: T. R. Porter (meeting recorded)

0915 - Data Review:

-Returns to Labrador Rivers (Reddin)
- Harvests of salmonids in various fisheries in Labrador (Reddin)
1030 -Coffee Break
-Returns to Insular Newfoundland Rivers, Smolt production and marine survival trends (Bourgeois)

1200 - 1300 Lunch

1300 – (continued)

- Update biological characteristics Bay St. George Rivers (Veinott)
-Update acoustic telemetry studies Conne River (Dempson)
- Angler characteristics and attitudinal data pertaining to management preferences for the -Avalon Peninsula – (R. Perry)
1500 -Coffee Break
-Risk assessment and modeling population responses to exploitation in recreational fisheries – (B. Adams)
-Jonathan's Brook watershed stock assessment – (D. Keefe)

Day 2

0900 - - Listing of rivers of Insular NF with salmon populations (Reddin)
- Exploitation of Atlantic salmon in Nfld angling fishery(Reddin)
-Distribution at sea of Atlantic salmon kelts (Reddin)
1030 -Coffee Break
-Update research initiative Brown Trout – (P. Westley)
-Experiences with DIDSON sonar in Nfld, 2008(Reddin)
-Update Pre-COSEWIC meeting Atlantic Salmon – Feb. 2009(Bourgeois)
-Manuscripts for upgrade to Research Documents and Science Advisory Report
-Other Business

Appendix 4: List of Participants

List of attendees at the Salmonid stock assessment meeting, 6 - 7 November 2008.

NAME	AFFILIATION / ADDRESS	PHONE	FAX	E-MAIL
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Appendix 4 con't: List of attendees at the Salmonid stock assessment meeting, 6 - 7 November 2008.

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Appendix 4 con't: List of attendees at the Salmonid stock assessment meeting, 6 - 7 November 2008.

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Appendix 5a: Summary of Status of Atlantic Salmon in English River, SFA 1, 1999-2008.

STOCK: English River (SFA 1) **Accessible drainage area=125 km²**

CONSERVATION REQUIREMENT: 0.510 million eggs calculated as fluvial area x 1.9 eggs/m²

Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008 [2]**	**MIN [1]**	**MAX [1]**
Total returns to river												
Small	59	367	224	190	108	56	337	484	498	428	56	498
Large	48	15	41	31	19	25	28	44	42	51	15	51
Recreational harvest (small salmon)												
Retained	5	8	5	1	0	2	0	6	4	4	0	8
Released	0	0	0	0	0	0	0	0	0	0	0	0
Recreational harvest (large salmon)												
Retained	2	0	0	0	0	0	0	0	0	0	0	2
Released	0	0	0	0	0	0	0	0	0	0	0	0
Other Removals												
Small	0	0	10	5	21	0	0	5	3	5	0	21
Large	0	0	2	2	2	0	0	0	2	0	0	2
Spawners												
Small	54	359	209	184	87	54	337	473	491	419	54	491
Large	46	15	39	29	17	25	28	44	40	51	15	51
Egg conservation requirement												
% met	40	73	63	52	26	26	80	115	115	109	26	115

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

Recreational catches: observations from counting fence workers.

Data and methodology: complete counts of salmon were obtained at fish counting fence. Total returns to river for 2003-2006 and 2008 include fish counted below fence on swim-thru before removal.

State of the stock: returns have increased from previous years for large salmon but decrease for small from the 2007 high. Conservation limits for Labrador rivers are 190 eggs per 100 m^2 which is used to evaluate the percent of egg requirements met, was exceeded in 2006-2008.

Forecast: No forecast available.

Appendix 5b: Summary of Status of Atlantic Salmon in Muddy Bay Brook, SFA 2, 2002-08.

STOCK: Muddy Bay Brook (Dykes River SFA 2) **213 km²**

CONSERVATION REQUIREMENT: 0.582 million eggs calculated as fluvial area x 1.9 eggs/m²

Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**MIN [1]**	**MAX [1]**
Total returns to river									
Small	106	394	454	520	445	240	474	106	520
Large	11	31	28	20	17	14	36	11	36
Recreational harvest (small salmon)									
Retained	9	13	30	1	0	0	0	0	30
Released	4	2	17	0	0	0	0	0	17
Recreational harvest (large salmon)									
Retained	0	0	0	0	0	0	0	0	0
Released	2	0	0	0	0	0	0	0	2
Spawners									
Small	106	394	454	520	445	240	474	106	520
Large	11	31	28	20	17	14	36	11	36
Egg conservation requirement									
% met	43	153	173	190	161	90	184	43	190

[1] Min and max are for the period of record except recreational harvest is since 1994.
[2] Preliminary
Note: Any changes from previous years are due to the updating of preliminary data.

Recreational catches: catches are from License stub return data - no way of knowing if upstream or downstream of fence.

Data and methodology: complete counts of salmon were obtained at a fish counting fence. Counts were adjusted in 2003 for fence non-operational periods.

State of the stock: returns of small salmon have increased from 2006-2007 with the second highest count on record, whereas, large salmon returns increased from the previous high in 2003. Conservation limits for Labrador rivers are 190 eggs per 100m² which is used to evaluate the percent of egg requirements met which were exceeded in 2003-2006 and 2008.

Forecast: No forecast available.

Appendix 5c: Summary of Status of Atlantic Salmon in Southwest Brook, SFA 2, 1998-2008.

STOCK: Southwest Brook (Paradise River SFA 2) **385 km²**

CONSERVATION REQUIREMENT: 0.714 million eggs calculated as fluvial area x 1.9 eggs/m²

Year	1998	1999	2001	2002	2003	2004	2005	2006	2007	2008 [2]	MIN [1]	MAX [1]
Total returns to river												
Small	110	331	323	235	158	615	858	326	303	495	110	858
Large	4	43	32	34	16	54	54	35	32	35	4	54
Recreational harvest (small salmon)												
Retained	0	0	0	0	0	0	0	0	0	0	0	0
Released	0	0	0	0	0	0	0	0	0	0	0	0
Recreational harvest (large salmon)												
Retained	0	0	0	0	0	0	0	0	0	0	0	0
Released	0	0	0	0	0	0	0	0	0	0	0	0
Spawners												
Small	110	331	321	231	156	615	858	326	303	495	110	858
Large	4	43	32	34	16	54	54	35	32	35	4	54
Egg conservation requirement												
% met	39	139	110	82	52	201	267	110	102	157	39	267

[1] Min and max are for the period of record except recreational harvest is since 1994.
[2] Preliminary
Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: catches are not recorded separately for Southwest Brook which is a tributary of Paradise River.

Data and methodology: complete counts of salmon were obtained at a fish counting fence. Counts were adjusted in 1998, 2003 and 2005 for fence non-operational periods.

State of the stock: 2008 returns show a increase for small and large over 2007 but a decrease from 2005-2006. Conservation limits for Labrador rivers are 190 eggs per 100m² which is used to evaluate the percent of egg requirements met which were exceeded in 2004-2008.

Forecast: No forecast available.

Appendix 5d: Summary of Status of Atlantic Salmon in Sand Hill River, SFA 2, 1994-2008.

STOCK: Sand Hill River (SFA 2) **Drainage Area 1155 km²**

CONSERVATION REQUIREMENT: 10.099 million eggs calculated as fluvial area x 1.9 eggs/m²

Year	1994	1995	1996	2002	2003	2004	2005	2006	2007	2008 [2]	MIN [1]	MAX [1]
Total returns to river												
Small	2180	2796	3319	3141	3171	4008	7007	4967	3222	4842	2038	7007
Large	730	560	414	561	627	604	875	568	693	795	138	875
Recreational harvest (small salmon)												
Retained	279	289	321	155	212	109	177	123	135	95	95	321
Released	326	340	702	679	608	647	925	628	464	757	326	925
Recreational harvest (large salmon)												
Retained	29	28	20	1	7	1	5	2	1	1	0	28
Released	7	14	36	68	60	86	104	30	44	87	0	104
Other removals												
Small	0	0	0	0	15	0	0	0	6	8	0	15
Large	0	0	0	0	2	0	0	0	6	2	0	2
Spawners												
Small	1868	2473	2928	2918	2883	3834	6735	4686	3041	4671	1819	6735
Large	700	531	390	553	612	595	860	538	688	785	136	860
Egg conservation requirement												
% met	65	70	74	81	82	101	168	118	89	125	34	168
Smolt count									80994	62985	37109	80994

¹ Min and max are for the period of record except recreational harvest which is since 1994.

² Preliminary

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

Recreational catches: catches are from angling camps on Sand Hill River and observations of counting fence staff.

Data and methodology: counts of salmon were obtained at a fish counting fence. Total river returns were adjusted for non-operational periods for all years except 2005. Smolt count derived from mark-recapture for 2007 and total smolt fence count for 2008

State of the stock: numbers of both small and large were down from 2005 but above most other years. Large salmon numbers are the second highest recorded. Conservation limits for Labrador rivers are 190 eggs per 100m^2 which is used to evaluate the percent of egg requirements met which were exceeded in 2004-2006 and 2008.

Forecast: No forecast available.

Appendix 5e: Summary of Status of Atlantic Salmon in Exploits River, SFA 4, 2000-08.

STOCK: Exploits River **Drainage area:** 11602 km²

CONSERVATION REQUIREMENT:

Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007***	**2008**	**MIN**	**MAX**
Total returns:											
Small	12063	19370	15589	29198	27195	28050	24924	21676	31722	4470	31722
Large	684	1347	890	1336	949	1967	3365	3956	4554	89	4554
Recreational harvest (small salmon)											
Retained	1467	2430	2730	3633	3292	3879	2515	2287	3121	577	4407
Released	2899	2967	3551	2975	2494	5470	4896	1882	3543	1145	5672
Recreational harvest (large salmon)											
Retained	0	0	0	0	0	0	0	0	0	0	83
Released	252	289	331	198	153	511	251	274	277	0	350
Other Removals	40	59	51	62	11	24	33	40	27	0	117
Broodstock removal	0	0	0	0	0	0	0	0	0	0	5111
Spawners	10919	17902	13310	26538	24575	25516	25227	23089	32746	2326	30559
Fry Stocked	0	0	0	0	0	0	0	0	0	0	6416567
Egg conservation requirement											
% met	21	34	25	51	47	49	48	44	63	6	69
Lower	56	91	56	141	130	83	125	153	128	26	215
Middle	16	27	23	39	37	51	40	27	60	2	60
Upper	2	5	3	7	2	4	1	2	5	0	125

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

* Preliminary

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.

State of 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 quantative forecast available.

Appendix 5f: Summary of Status of Atlantic Salmon in Campbellton River, SFA 4, 2000-08.

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	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008** [2]	**MIN** [1]	**MAX** [1]
Total returns to river											
Small	1798	2151	1974	2219	2726	3746	2768	1849	3997	1798	4001
Large	208	119	123	152	161	276	328	487	432	119	560
Recreational harvest (small salmon)											
Retained	226	148	136	170	222	145	150	177	173	13	365
Released	176	29	57	20	95	17	54	32	44	17	372
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	0	0
Released	51	9	6	0	4	4	4	5	3	0	51
Precocious post smolts	208	228	253	147	365	364	121	200	270	13	365
% of adult run composed of previous spawners	7.2	12.3	7.3	17.4	7.5	17.3	31.3	45.4	8.27	7.24	45.4
Spawners											
Small	1346	1772	1579	1900	2130	3235	2452	1469	3550	1346	3675
Large	203	118	122	152	161	276	327	487	431	118	557
Egg conservation requirement											
% met	152	148	138	191	212	328	273	212	382	138	328
Smolt count	35596	37170	32630	35089	32780	30123	33304	35742	40390	30123	62050
Kelt count	1597	706	1084	791	713	1329	1883	2006	930	351	2838
% Sea survival (corrected)											
(Adult return year)	3.66	5.35	5.14	6.02	7.27	9.90	6.65	3.79	10.66	2.25	10.66

[1] Min and max are for the period of record since 1993.
[2] Preliminary figures for 2008

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

Recreational catches: The recreational catch for 2008 are preliminary.

Data and methodology: Smolts were enumerated at a counting fence. Returning adults 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 calculations of spawning escapements for the years 1993-08. Recreational data for 1997-08 were from the License Stub Return System. Sea survival is corrected to exclude previous spawners in the upstream migration. Pervious spawners were estimated in 1999 from survival patterns in previous years. The egg conservation requirement for years of low sample numbers from the recreational fishery was calculated using the average whole weight of females and percent female by combining samples from 1993 to 2005. Precocious Post smolts were excluded from the spawning population since their contributions are not fully known.

State of the stock: Conservation requirements were met for all years from 1993 to 2008.

available.

Appendix 5g: Summary of Status of Atlantic Salmon in Gander River, SFA 4, 2002-08.

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	2002	2003	2004	2005	2006	2007 [2]	2008 [2]	MIN [1]	MAX [1]
Total returns to river									
Small	13444	13657	18521	17828	13959	11571	22442	6745	26205
Large	1898	1853	2668	2461	1927	1243	1560	473	4815
Recreational harvest (small salmon)									
Retained	1726	1735	1325	1893	1199	577	1346	577	4537
Released	678	664	795	1410	554	228	730	228	3323
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	-	-
Released	184	65	58	335	94	35	117	35	685
Spawners									
Small	11650	11787	17091	15667	12705	10971	21023	5565	24739
Large	1880	1911	2536	2407	1918	1239	1548	473	4794
Egg conservation requirement									
% met	91	96	144	120	87	71	129	36	128

[1] Min and max are for the period of record since 1984 except recreational harvest is since 1994.
[2] Preliminary
Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: Recreational angling data for 1994-2007 are from the License Stub Return System.

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 for 2000-2008 were estimated from relationships between counts at the Salmon Brook fishway and total returns to the counting fence for the period 1989-1999. The 2003-2007 mean angling data was used for 2008. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2008.

State of the stock: Conservation requirement in terms of eggs, in 2008 (129%), is the highest on record. In terms of small salmon, conservation requirement was met only in 1993 with 2008 (96%) being the second highest. Conservation egg requirement was achieved in eight of the 17 moratorium years. 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 1992-2008 occurred in pre-moratorium years.

Forecast: No forecast available.

Appendix 5h: Summary of Status of Atlantic Salmon in Middle Brook, SFA 5, 2002-08.

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	**2002**	**2003**	**2004**	**2005**	**2006**	**2007** [2]	**2008** [2]	**MIN** [1]	**MAX** [1]
Total returns to river									
Small	916	1183	1520	1538	1173	1079	2103	626	2625
Large	69	74	88	62	115	142	143	13	262
Recreational harvest (small salmon)									
Retained	117	97	190	141	152	171	150	84	391
Released	28	29	24	96	75	138	72	19	458
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	-	-
Released	1	2	1	5	7	33	10	1	33
Spawners									
Small	796	1083	1328	1387	1013	894	1946	461	2342
Large	69	74	88	62	114	139	142	13	261
Egg conservation requirement									
% met	101	134	162	163	133	125	240	49	301

[1] Min and max are for the period of record since 1984 except recreational harvest is since 1994.
[2] Preliminary
Note: Any changes from previous years are due to the updating of preliminary data and biological characteristics information.

Recreational catches: Recreational angling data for 1994-2007 are from the License Stub Return System.

Data and methodology: Complete counts are available from a fishway located on the lower river. The 2003-2007 mean angling data was used for 2008. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2008.

State of the stock: Conservation requirement in terms of eggs and small salmon was met for all years since the moratorium started in 1992 except for small salmon in 2002 (79%) and 2007 (88%). 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. The small salmon returns in 2008 were up 95% from 2007 and 31% from the 92-07 mean.

Forecast: No forecast available.

Appendix 5i: Summary of Status of Atlantic Salmon in Terra Nova River, SFA 5, 2002-08.

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	2002	2003	2004	2005	2006	2007 [2]	2008 [2]	MIN [1]	MAX [1]
Total returns to river									
Small	1435	2271	3006	2417	2546	1672	3588	1127	3588
Large	271	330	397	316	438	241	431	56	637
Recreational harvest (small salmon)									
Retained	146	105	134	193	127	169	146	105	645
Released	142	133	229	459	353	319	299	133	464
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	-	-
Released	7	10	7	45	209	28	60	4	209
Broodstock removal [3]									
Small	0	0	0	0	0	0	0	0	352
Large	0	0	0	0	0	0	0	0	44
Spawners									
Small	1311	2179	2885	2232	2420	1516	3542	815	3542
Large	271	329	397	311	418	238	426	56	588
Egg conservation requirement									
% met	28	42	54	42	47	29	61	14	55

[1] Min and max are for the period of record since 1984 except recreational harvest is since 1994.
[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: Recreational angling data for 1994-2007 are from the License Stub Return System.

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. The 2003-2007 mean angling data was used for 2008. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2008.

State of the stock: The proportion of conservation requirement achieved in 2008 was 61%, the highest on record. The 2008 return of 3588 small salmon was 115% higher than in 2007 and 68% higher than the 1992-2007 mean. Although this river has never achieved conservation requirement, egg depositions during the moratorium years 1992-2008 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.

Appendix 5j: Summary of Status of Atlantic Salmon in Northwest River (Port Blandford), SFA 5, 2000-08.

STOCK: **Northwest River (SFA 5)** **Drainage Area:** 689 km^2

CONSERVATION REQUIREMENT: **4.07 million eggs (equivalent to 1,726 small salmon)**
Management Target 2002-2005 **700 salmon**

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Min	Max
Total returns:											
Small	272	102	443	1,012	1207	1210	783	675	1,257	102	1257
Large	106	50	114	273	265	305	197	94	229	50	305
Recreational Harvest(small salmon)											
retained	0	0	0	51	65	78	62	33	100	0	100
released	0	0	0	0	0	0	0	0	0	0	0
Recreational Harvest(large salmon)											
retained	0	0	0	0	0	0	0	0	0	0	0
released	0	0	0	0	0	0	0	0	0	0	0
Other removals											
Small	2	0	1	2	3	13	17	19	39	0	17
Large	0	0	1	0	1	3	8	3	0	0	8
Spawners											
Small	270	102	442	959	1163	1119	704	623	1,178	102	1178
Large	106	50	113	273	264	302	189	92	229	50	302
Conservation Requirement											
% eggs met	27	11	37	81	92	93	58	50	92	11	93
Smolt Count	11281	-	-	-	-	-	-				
Smolt-to-adult Survival	1	-	-	-	-	-	-				

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

Data and methodology: Counts of adults have been available from a counting fence since 1995. A smolt population estimate was conducted in 2000. Angling data for 2003 provided by Parks Canada. In 2008 the counting fence operated up to Aug 16.

State of the stock: Conservation egg deposition has not been met during the time series from 1995. A single smolt population estimate resulted in the lowest sea survival recorded on any river studied.

Forecast: No forecast available.

Appendix 5k: Summary of Status of Atlantic Salmon in Northeast Brook (Trepassey), SFA 9, 2002-08.

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

CONSERVATION REQUIREMENT:
fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	2002	2003	2004	2005	2006 [2]	2007 [2]	2008 [2]	MIN [1]	MAX [1]
Total returns to river									
Small	65	115	70	69	76	37	97	37	158
Large	2	11	11	5	5	3	4	2	41
Recreational harvest (sm. salmon)									
Retained									
Released									
Recreational harvest (lg. salmon)									
Retained									
Released									
Spawners									
Small	65	115	70	69	75	37	97	37	158
Large	2	11	11	5	5	3	4	2	41
Egg conservation requirement									
% met	156	303	198	170	184	92	232	92	368
Smolt count	2076	1064	1571	1384	1385	1777	1868	792	2076
% Sea survival									
(Adult return year)	7.1	5.5	6.6	4.4	5.5	2.7	5.5	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. In the past, 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 requirement achieved in 2008 (232%) is the highest on record since 2003. 2007 was the first year in the time series when the conservation egg requirment was not met. In terms of small salmon, the lowest percentage of conservation requirement achieved also occurred in 2007. The maximum number of smolts counted was 2,076 in 2002 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. Sea survival in 2008 increased 104% over that of 2007 and 3% from the 92-07 mean.

Forecast: No forecast available.

Appendix 5I: Summary of Status of Atlantic Salmon in Rocky River, SFA 9, 2001-08.

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	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**MIN [1]**	**MAX [1]**
Total returns to river										
Small	233	276	402	169	427	352	174	695	80	695
Large	60	78	73	235	95	56	35	56	1	235
Recreational harvest (small salmon)										
Retained	N/A	0	0	0	0	0	0	0	0	0
Released	N/A	5	5	0	6	0	0	0	0	5
Recreational harvest (large salmon)										
Retained	N/A	0	0	0	0	0	0	0	0	0
Released	N/A	0	0	0	2	0	0	0	0	0
Broodstock removal	0	0	0	0	0	0	0	0	0	76
Spawners										
Small	233	276	401	169	426	352	174	680	158	680
Large	60	78	73	235	95	56	35	56	1	89
Fry stocked	0	0	0	0	0	0	0	0	81983	434500
Egg conservation requirement										
% met	31	38	50	51	55	42	22	76	17	76
Smolt count	9392	10144	4440	13047	15847	13200	12355	18338	4440	18338
% Sea survival										
(Adult return year)	3	3	4	4	3	2.2	1.3	5.6	1.8	5.6

[1] Min and max are for the period of record since 1987.
[2] Preliminary
smolt to adult survival for 2001 -2007 is smolt to small salmon

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

Recreational fisheries: 2002 was the first time a recreational fishery (hook and release only) was opened on Rocky River.

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

Forecast: There is no forecast for this stock.

Appendix 5m: Summary of Status of Atlantic Salmon in Little River, SFA 11, 2000-08.

STOCK: **Little River (SFA 11)** **Drainage Area:**

CONSERVATION REQUIREMENT: 0.306 million eggs (equivalent to 230 small salmon)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Min[1]	Max[1]
Total returns:	616	161	528	335	687	231	162	47	74	61	801
Small	564	125	487	322	656	216	136	39	71	55	674
Large	52	36	41	13	31	15	26	8	3	3	127
Recreational Harvest(small salmon)	-	-	-	-	-	-	-	-	-	-	-
retained	-	-	-	-	-	-	-	-	-	-	-
released	-	-	-	-	-	-	-	-	-	-	-
Recreational Harvest(large salmon)	-	-	-	-	-	-	-	-	-	-	-
retained	-	-	-	-	-	-	-	-	-	-	-
released	-	-	-	-	-	-	-	-	-	-	-
Other removals	3	0	6	0	0	0	0	1	1	0	19
Small	3	0	5	0	0	0	0	1	1	0	18
Large	0	0	1	0	0	0	0	0	0	0	2
Brood stock removals:	352	0	0	0	0	0	0	0	0	0	352
Spawners	261	161	522	335	682	230	160	46	73	26	687
Small	N/A	125	482	322	652	216	135	38	70	13	656
Large	N/A	36	40	13	30	14	25	8	3	3	125
Fry Stocked	298458	288897	0	0	0	0	0	0	0	0	306180
Conservation Requirement % eggs met	263	69	224	144	293	99	69	20	31	20	295
Smolt Count	2703	4983	9963	8570	4640	1283	753	1159	4984	324	9963

[1] Max and Min are for the period since 1987.

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

Recreational catches: The river is presently closed to angling.

Data and methodology: Returns to the river are assessed by a counting fence.

State of the stock: Returns of salmon are considered to be minimum values as salmon are often observed spawning below the counting fence.

Forecast: No forecast available.

Appendix 5n: Summary of Status of Atlantic Salmon in Conne River, SFA 11, 2002-08.

STOCK: **Conne River (SFA 11)** 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	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008** [2]	**MIN** [1]	**MAX** [1]
Total returns to home waters									
Small	2573	1953	3818	1978	2623	1174	2823	1173	10155
Large	167	51	175	105	170	49	144	49	516
First Peoples' harvest									
Small	0	0	0	0	0	0	0	0	948
Large	0	0	0	0	0	0	0	0	11
Recreational harvest (small salmon)									
Retained	275	180	444	75	395	0	385	108	3302
Released	-	-	-	-	-	0	-	0	80
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	0	27
Released	-	-	-	-	-	-	-	0	0
Broodstock removal									
Small	0	0	0	0	0	0	0	25	245
Large	0	0	0	0	0	0	0	0	1
Spawners									
Small	2295	1770	3366	1898	2210	1167	2411	1286	7823
Large	167	51	174	105	168	49	144	51	488
Management Target									
% met	61	42	97	51	61	31	65	30	219
Egg conservation requirement % met	110	76	174	92	110	55	117	55	394
Smolt estimate	81806	71479	79667	66196	35146	63738	68242	35146	100983
% Sea survival (Adult return year)	3.0	2.4	5.3	2.5	4.0	3.3	4.4	2.4	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, with 65% achieved in 2008. In contrast with the Mangement Target, the Conservation egg requirement was met or exceeded from 1986-1990, 1993, 1995 - 2000, and again in 2002, 2004, 2006 and 2008. Returns of adult salmon in 2008 increased substantially in 2008 follow a record low return in 2007. Sea survival from smolts (2007) to adult small salmon returns in 2008 increased from 3.3% (2007 returns) to 4.4% (2008), but still remains well below historic highs in the late 1980s.

Forecast: Smolt estimates for 2008 are again comparable with previous values at about 68,000. Thus, a marine survival of 3.6% would be required in order for the conservation requirements of 2475 small salmon to attained. Actual forecasts of survivals and thus returns, however, are not made owing to the uncertainty associated with making predictions a year in advance.

Appendix 5o: Summary of Status of Atlantic Salmon in Middle Barachois Brook, SFA 13, 1999-2008.

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	1999	2000	2001	2002	2003	2004	2005	2008 [2]	MIN [1]	MAX [1]
Total returns to river										
Small	563	1142	937 [3]	569	743	1087	593	451	134	1619
Large	66	155	142 [3]	164	107	100	97	20	0	1159
Recreational harvest (small salmon)										
Retained	-	-	-	43	-	-	-	-	51	534
Released	22	3	26	107	96	87	30	49	0	195
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	0	117
Released	2	0	9	40	61	42	0	24	0	81
Spawners										
Small	560	1142	934 [3]	515	733	1078	590	446	83	1329
Large	66	155	141 [3]	160	101	96	97	18	0	1057
Egg conservation requirement										
% met	43	95	80 [3]	61	61	79	52	28	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 snorkelers in August 1996, 1997, 1999-2005 and 2008. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river for all years except 2008. This river was open to hook-and-release angling (Class IV) again in 2008, from June 1 to September 7. Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock: In 2008, Middle Barachois Brook attained 28% of its conservation level egg deposition. This estimate is 45% lower than 2005, 59% lower than the 1996-2005 mean and is the lowest on record since 1999. The returns of small and large salmon were lower than the average returns for 1996-2005, 46% and 83% respectively.

Forecast: No forecast available.

Appendix 5p: Summary of Status of Atlantic Salmon in Robinsons River Brook, SFA 13, 1999-2008.

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	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2008** [2]	**MIN** [1]	**MAX** [1]
Total returns to river										
Small	1452	1501	1909 [3]	909	1211	1989	1372	1790	274	3186
Large	204	320	232 [3]	201	188	164	118	103	21	733
Recreational harvest (small salmon)										
Retained	0	153	106	123	106	134	209	126	3	905
Released	529	553	268	283	389	439	485	177	0	634
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	0	210
Released	38	44	134	34	147	49	199	68	7	199
Spawners										
Small	1399	1293	1776 [3]	758	1066	1811	1114	1646	158	2281
Large	200	316	219 [3]	198	173	159	98	96	21	604
Egg conservation requirement										
% met	118	135	142 [3]	82	94	132	81	110	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 snorkelers in August 1996, 1997, 1999-2005 and 2008. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river for all years except 2008. This river was open to Class III retention angling in 2008 from June 1 to September 7, with a restriction of one small retained daily. The size limit of 60 cm or greater for large salmon remained in place. Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock: In 2008, Robinsons River attained 110% of conservation level egg deposition. This estimate is 35% higher than in 2005 and 5% higher than the 1996-2005 mean. The total returns of small salmon increased over 2005 and the mean, 30% and 31% respectively, while the large salmon numbers decreased. The large salmon number (103), the lowest on record, decreased 13% from 2005 and 48% from the 1996-2005 mean.

Forecast: No forecast available.

Appendix 5q: Summary of Status of Atlantic Salmon in Fischells Brook, SFA 13, 1998-2008.

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	1998	1999	2000	2001	2002	2003	2004	2005	2008 [2]	MIN [1]	MAX [1]
Total returns to river											
Small	205	1264	1800	248 [3]	414 [4]	1071	1254	1390	1664	42	1800
Large	72	246	276	45 [3]	42	180	190	169	94	0	455
Recreational harvest (small salmon)											
Retained	8	-	-	34	-	-	-	-	37	17	374
Released	27	-	-	3	-	-	-	33	58	0	162
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	0	66
Released	4	-	-	7	-	-	-	16	15	0	150
Spawners											
Small	194	1264	1800	214 [3]	399	1046	1254	1387	1621	25	1800
Large	72	246	276	44 [3]	42	180	190	167	92	0	415
Egg conservation requirement											
% met	23	110	142	18 [3]	28	86	99	101	99	1	142

[1] Min and max are for the period of record since 1974.
[2] Preliminary
[3] Minimum
[4] Includes 15 salmon removed from poachers net in 2002 and 25 in 2003

Data and methodology: Visual counts of salmon were made by snorkelers in August each year 1997-2005 and again in 2008. Adjustment factors were applied to visual counts to give estimates of the total numbers of salmon in the river at the time of the survey, except 2008. Angling data are from the License Stub Return System. The river was closed to angling in 1999, 2000, 2002-2004 and was open to hook-and-release fishing only in 2005. It was upgraded to a Class III river in 2006, with a restriction of one small retained daily and a season of June 15-September 7. In 2007 the season was extended June 1-September 7 and continued in 2008. The size limit of 60 cm or greater for large salmon, introduced in 2005, continued in 2008. A 10% hook-and-release mortality was assumed.

State of the stock: In 2008, Fischells Brook achieved 99% of its conservation level egg deposition. This estimate is similar to 2005 and 36% higher than the 1997-2005 mean. Returns of small salmon were higher than 2005 and the 1997-2005 mean while returns of large salmon were lower (-45% and -36%).

Forecast: No forecast available.

Appendix 5r: Summary of Status of Atlantic Salmon in Flat Bay Brook, SFA 13, 1999-2008.

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	1999	2000	2001	2002	2003	2004	2005	2008 [2]	MIN [1]	MAX [1]
Total returns to river										
Small	2276	2397	1150 [3]	1612	1540	2004	2591	2302	179	2591
Large	235	494	176 [3]	198	193	184	307	134	5	494
Recreational harvest (small salmon)										
Retained	-	146	170	224	82	77	201	237	0	609
Released	389	1165	280	150	329	84	341	177	0	1165
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	0	59
Released	36	276	34	33	58	10	79	141	0	276
Spawners										
Small	2237	2134	952 [3]	1373	1425	1919	2356	2048	107	2356
Large	231	466	173 [3]	195	187	183	299	120	1	466
Egg conservation requirement										
% met	149	167	71 [3]	97	99	126	162	127	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 snorkelers in August each year 1996, 1998-2005 and again in 2008. Adjustment factors were applied to the visual counts to derive an estimate of the number of salmon in the river at the time of the survey, except in 2008. This river was open to retention angling, as a Class III river (seasonal retention of two small fish), June 1, 2008. After in-season review (August 12), it changed to a Class II river (seasonal retention of four small fish) for the remainer of the season . Angling data are from the License Stub Return System. A 10% hook-and-release mortality was assumed.

State of the stock: In 2008, Flat Bay Brook attained 127% of its conservation level egg deposition. This estimate is 22% lower than the estimate for 2005 and 10% above the average egg deposition, 1996-2005.

Forecast: No forecast available.

Appendix 5s: Summary of Status of Atlantic Salmon in Harry's River, SFA 13, 2002-08.

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

CONSERVATION REQUIREMENT: 7.8 million eggs calculated as fluvial area x 2.4 eggs/m^2 and lacustrine area x 368 eggs/ha.

Year	2002	2003	2004	2005	2006	2007[2]	2008[2]	MIN [1]	MAX [1]
Total returns to river									
Small	1640	2334	2828	2495	3004	1414	3383	888	3383
Large	285	422	498	453	680	287	388	16	676
Recreational harvest (small salmon)									
Retained	-	91	223	163	209	160	160	2	319
Released	400	237	534	485	1283	219	219	23	1411
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	0	0
Released	75	132	266	139	216	91	91	28	266
Spawners									
Small	1600	2211	2543	2279	2662	1231	3198	573	3198
Large	277	403	470	439	658	276	379	13	661
Egg conservation requirement									
% met	60	84	98	89	116	55	104	13	116
Spawners on Pinchgut Brook tributary									
Small	592	352	292					200	749
Large	23	22	15					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 was limited to catch and release angling from 1996 to 2002 but was expanded in 2003-2008 to permit a limited retention fishery as part of an overall conservation/recovery/ stewardship program. Retention angling was restricted to the main stem of Harry's River from Home Pool at the outlet of Georges Lake to the river mouth. No retention of salmon is permitted on Georges Lake and Pinchgut Lake, hook and release only.

Data and methodology: Total returns to Harry's River in 2008 were determined from a counting fence operated at Gallant's from May 31-August 5, snorkel surveys conducted below the fence site on August 5 and angling removals below the fence to August 5. The angling data are from the License Stub Return System .

Total returns to Harry's River in 2003-2005 were determined from a counting fence operated at the mouth of the river. Spawning escapements were determined by subtracting angling removals. Estimates of total spawners in 1992-2002 were derived from counts of small and large salmon at a fish counting fence operated on Pinchgut Brook tributary 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 are from the License Stub Return System. Spawners in 2001-2002 include an adjustment for small and large salmon observed in snorkel surveys of the lower part of the mainstem below George's Lake in mid-August. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2008.

State of the stock: The conservation requirement attained in 2008 (104%) is 10% lower than 2006 and 82% higher than the 92-07 mean.

Forecast: No forecast available.

Appendix 5t: Summary of Status of Atlantic Salmon in Torrent River, SFA 14, 2002-08.

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/m^2 and lacustrine area x 105 eggs/ha.

Year		2002	2003	2004	2005	2006	2007 [3]	2008 [3]	MIN [1]	MAX [1]
Total returns to river [2]										
Small		4861	3955	5110	4342	4030	3036	5816	96	7475
Large		432	341	549	780	1431	521	1283	7	1430
Recreational harvest (small salmon)										
Retained		822	588	674	455	574	440	546	137	822
Released		1299	695	854	1084	718	370	744	76	1299
Recreational harvest (large salmon)										
Retained		-	-	-	-	-	-	-	-	-
Released		111	107	128	92	115	76	104	28	224
Specimens collected below fishway:	**Small**				126		20			
	Large				0		13			
Spawners										
Small		3909	3297	4351	3653	3384	2539	5196	121	6923
Large		421	330	536	771	1419	500	1273	3	1419
Egg conservation requirement										
% met		597	496	686	675	844	458	1197	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 until a minmum spawning escapement of 750 salmon had passed through the fishway was dropped in 1999. The area above the fishway opened to hook-and-release angling in 2002 and to Class II retention angling in 2007. A telephone survey was conducted in 2007 to determine the number of fish taken above the fishway.

Data and methodology: Returns to the river are determined from counts at the fishway and recreational catch data below the fishway. The fishway has been monitored since 1966. Recreational fishery data are from the License Stub Return System. A hook-and-release mortality of 10% was used in the calculation of spawning escapements for the years 1985-2008.

State of the stock: The count of small salmon at the Torrent River fishway in 2008 was 105% higher than in 2007. 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 new habitat opened up above the fishway. The conservation requirement was achieved again in 2008, and was 161% higher than 2007 and 76% above the 92-07 mean.

Forecast: No forecast available.

Appendix 5u: Summary of Status of Atlantic Salmon in Western Arm Brook, SFA 14A, 2002-08.

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/m^2 and lacustrine area x 105 eggs/ha.

Year	2002	2003	2004	2005	2006	2007 [3]	2008 [3]	MIN [1]	MAX [1]
Total returns to river									
Small	1465	1406	1151	1019	1300	793	1920	233	1920
Large	48	23	74	43	44	17	15	0	128
Recreational harvest (small salmon)									
Retained	-	-	-	-	-	-	-	0	24
Released	-	-	-	-	-	-	-	0	0
Recreational harvest (large salmon)									
Retained	-	-	-	-	-	-	-	-	-
Released	-	-	-	-	-	-	-	-	-
Known removals above counting fence									
Small	2	20	2	30	22	14	13	0	346
Large	0	2	1	1	1	0	0	0	3
Spawners									
Small	1463	1386	1149	989	1278	779	1907	117	1907
Large	48	21	73	42	43	17	15	0	128
Egg conservation requirement									
% met	510	466	425	355	446	258	611	30	625
Smolt count	14999	12086	17323	8607	20826	16621	17444	6232	23845
% Sea survival [2]									
(Adult return year)	9.1	9.4	9.5	5.9	15.1	3.8	11.6	2.2	15.1

[1] Min and max are for the period of record since 1974.
[2] Sea survival is from smolt to returns as small salmon.
[3] Preliminary
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 1971-2008. 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: This river has exceeded conservation requirement every year since the moratorium. The percentage achieved in 2008 was 137% higher than in 2007 and 67% higher than the 92-07 mean. Smolt production in 2008 was 5% higher than in 2007 but 27% lower than the maximum production value (23845) achieved in 1997. The 2008 sea survival was up 203% from 2007 and 50% from the 92-07 mean.

Forecast: No forecast available.