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Proceedings of the Newfoundland and Labrador Region Salmonid Stock Assessment Meeting

November 5-6, 2009

St. John's, NL

Meeting Chairperson
C. Bourgeois

Rapporteur
T. R. Porter

Compte rendu de la réunion d'évaluation des stocks de salmonidés de la région de Terre-Neuve et du Labrador

Les 5 et 6 novembre 2009

St. John's, T.-N.-L.

Président de la réunion
C. Bourgeois

Rapporteur
T. R. Porter

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Canada

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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TABLE DES MATIÈRES / TABLE OF CONTENTS

SUMMARY

The seventeenth annual Salmonid Stock Assessment Meeting (Regional Assessment Process (RAP)) for the Newfoundland and Labrador Region was held in St. John's, NL, 5-6 November 2009. An update was provided on the status of Atlantic salmon stocks in Newfoundland and Labrador, with specific assessments on 17 rivers monitored in 2009. Data were presented on the estimates of adult salmon returns and the percentage of the conservation egg deposition achieved in 13 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 Atlantic salmon in the angling and food fisheries in 2008 were provided. The overall abundance of salmon declined in 2009 from levels observed in 2008; although increases were observed in some rivers particularly on the northeast coast of Newfoundland. The declines in large salmon are particularly concerning. The low survival of Atlantic salmon at sea, which has been experienced since the late 1980's, continues to be a significant factor contributing to the overall low abundance of salmon experienced in Newfoundland and Labrador. A review was conducted on the definition of conservation and biological reference levels as it applies to Atlantic salmon in Newfoundland and Labrador. There was a discussion on the available biological characteristics data for salmon populations in Bay St. George rivers; as well, as a preliminary evaluation of common trends and patterns in Atlantic salmon abundance in relation to oceanographic temperatures and the North Atlantic Oscillation Index. An updated list of rivers in Newfoundland and Labrador that contained populations of Atlantic salmon was presented. A presentation was made on changes in Atlantic salmon angler dynamics in Newfoundland and Labrador. A review of data on the "Mystery fish" in Southwest Pond, Bonavista Bay confirmed that the species was an anadromous Atlantic salmon. Two presentations were made on research studies being conducted on salmonids in Renews River. Information was presented on the research vessel cruise conducted in 2009. The presentations were reviewed and discussed by participants from DFO, Newfoundland and Labrador Provincial Department of Environment and Conservation, Parks Canada Agency, and various stakeholder groups.

SOMMAIRE

La dix-septième 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. Jonh's, T.-N.-L., les 5 et 6 novembre 2009. 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 17 cours d'eau ayant fait l'objet d'une surveillance en 2009. On a présenté des données sur les estimations de la montaison des adultes ainsi que du pourcentage de la ponte nécessaire pour assurer la conservation dans 13 cours d'eau de la partie insulaire de Terre-Neuve et dans 4 cours d'eau du Labrador. Des estimations de la production de saumoneaux dans 5 cours d'eau de Terre-Neuve et dans 1 cours d'eau du Labrador ont aussi été fournies. On a également 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 de 2008 ont été fournies. En général, l'abondance des saumons a diminué en 2009 comparativement aux niveaux observés en 2008; cependant, on a observé des augmentations dans quelques cours d'eau, particulièrement sur la côte nord-est de Terre-Neuve. Les déclins observés chez les saumons de grande taille sont particulièrement préoccupants. La faible survie en mer du saumon atlantique, qui persiste depuis la fin des années 1980, est encore un important facteur qui contribue à la faible estimation de l'abondance générale de saumons de Terre-Neuve et du Labrador. On a examiné les niveaux de référence de conservation et biologiques pour le saumon atlantique de Terre-Neuve et du Labrador. On a tenu des discussions sur les données disponibles concernant les caractéristiques biologiques des populations de saumons des cours d'eau qui se jettent dans la baie St. George ainsi que sur l'évaluation préliminaire des tendances et des profils communs dans l'abondance du saumon atlantique par rapport aux températures océanographiques et à l'indice d'oscillation nord-atlantique. On a présenté une liste mise à jour des cours d'eau de Terre-Neuve et du Labrador qui abritent des populations de saumons atlantiques. Un exposé a traité des changements dans la dynamique de la pêche à la ligne au saumon atlantique de Terre-Neuve et du Labrador. Un examen des données sur le « mystérieux poisson » de Southwest Pond, dans la baie de Bonavista, a confirmé que l'individu était un saumon atlantique anadrome. Deux exposés ont traité des recherches menées sur les salmonidés de la rivière Renews. On a présenté l'information sur la sortie en mer d'un navire de recherche en 2009. 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 Terre-Neuve-et-Labrador, de l'Agence Parcs Canada ainsi que de différents groupes d'intervenants.

INTRODUCTION

The sixteenth annual Regional Assessment Process (RAP) for Salmonids for the Newfoundland and Labrador Region was held at the Comfort Inn Airport, 106 Airport Road, St. John's, NL, 5-6 November 2009 to review information on the status of Newfoundland and Labrador Salmonid stocks. The Terms of Reference are provided in Appendix 1 (English) and Appendix 2 (French). The Agenda for the meeting is in Appendix 3. The meeting participants included representatives from: Department of Fisheries and Oceans (DFO) Science, and Fisheries and Aquaculture Management branches, Government of Newfoundland and Labrador, 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 Atlantic salmon 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.

The chair welcomed participants to the meeting, and asked each participant to introduce her/himself and with their affiliation. The chair gave a brief overview of the Terms of Reference for the meeting and stressed that Fisheries Management issues would not be discussed. The agenda was reviewed and two items were added to the agenda: 1) Process and products following CSAS Review of Science Advisory Report; and 2) Update on returns of salmon to Harrys River.

SUMMARY OF PRESENTATIONS

1. TITLE: Current processes and products following CSAS review

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

SUMMARY: The slides used in the presentation are provided in Appendix 6.

DISCUSSION:

- One participant inquired as to the process that stakeholder groups would follow to have requests for science advice placed on the RAP agenda. The stakeholder had made a request to Fisheries Management and Aquaculture Brach; but, it was never placed on the agenda. The chair indicated that there was a formal process within CSAS and he would get the information and pass it to the stakeholder.
- Another participant asked if advice that was placed in the SAR constituted formal peer review scientific advice or does the information have to be published in a Research Document before it was considered formal advice. The response was that the advice in the SAR was formal advice. A Research Document documenting the information supporting the advice is to be produced in a timely manner. Data, analytical methodology, results and conclusions are supposed to be tabled at the RAP for review prior to formulating the Science advice.

2. TITLE: Definition of conservation for Atlantic salmon

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

SUMMARY: An overview of the historical basis for determining reference levels, or bench marks, in the context of the "*conservation*" of the Atlantic salmon resource was provided. Early consideration of optimal production originated in the 1950s with the work of Dr. Paul Elson. As early as 1977, CAFSAC referred to 2.4 eggs/m^2 as the minimum number of required eggs for maximum smolt production. Refinement and debate over the suitability of this value was reviewed at a number of workshops. Of particular significance was the formal definition of conservation adopted by CAFSAC in 1991 as: *"That aspect of renewable resource management which ensures that utilization is sustainable and which safeguards ecological processes and genetic diversity for the maintenance of the resource concerned"*. It was acknowledged that stock-recruitment relationships have been constructed for salmon but in the absence of river-specific relationships an operational translation of conservation was required. Accordingly, egg deposition rates of 2.4 eggs/m^2 of fluvial (river) habitat in addition for insular Newfoundland of 368 eggs/hectare of lacustrine (lake) habitat was accepted as a biological reference level in the context of conservation of the resource.

The Wild Atlantic Salmon Conservation Policy, released in August 2009, defined conservation as: "*The protection, maintenance, and rehabilitation of genetic diversity, species, and ecosystems to sustain biodiversity and the continuance of evolutionary and natural production processes*". This Policy reiterates that the conservation limit, or benchmark reference level for salmon, continue to use the above noted values, and that the further the spawning escapement is below the reference level, and the longer this situation occurs, the greater the possibility exists of incurring risks which may cause irreversible damage to the stock. Numbers of salmon returning to various rivers is evaluated relative to the respective benchmark conservation level to infer the overall status of the resource.

DISCUSSION:

- Participants were pleased with the information presented. Many were not familiar with the derivation of the Conservation Levels used in Newfoundland.
- Considerable discussion occurred as to whether the Conservation Level was considered a biological threshold level below which no harvest should occur or a target management level. DFO considers the Conservation Level as a threshold level.
- Conne River has both a salmon conservation level (2,475 small salmon) and a management target (4,000 small salmon). The Conne River First Nations agrees with managing the fishery at the management target.
- There is insufficient information to determine what proportion of the conservation egg deposition level should be derived from large salmon.
- The Conservation Level for rivers in SFA 3-14B is 2.4 eggs/m^2 for fluvial habitat plus 368 eggs/hectare for lacustrine habitat for rivers in SFA 3-13, and 105 eggs/ hectare for rivers in SFA 14A and 14B. The Conservation Level for Labrador rivers in SFA 1 and 2 is 1.9 eggs/m^2 for fluvial habitat. Egg requirements for lacustrine habitat in SFAs 1 and 2 are assumed to be built into the 1.9 eggs/m^2. The different level in Labrador is related to differences in species composition, climate and productivity of the rivers.
- The approach of using a minimum number of eggs for establishing a Conservation Level is similar for North America and Europe; although the actual Conservation Level to meet the threshold limit differs.

- There was a discussion on how science gets the message to Fisheries Managers to use the Conservation Level as a threshold and not as a management target. It was pointed out, that each year on the first page Science Advisory Document, there is a statement that the *"Conservation requirements for Atlantic salmon rivers are considered to be threshold reference points".*
- The appropriate place for stakeholders to discuss management targets would be at the salmon management stakeholder consultation meetings.
- There was considerable discussion on the appropriateness of the Conservation Level established and the impact of going below that level. There were a number of questions related to the lack of increases in the size of stocks after the closures of the commercial fisheries and the benefit of having a spawning level above the Conservation Level.
- How does DFO establish the number of eggs deposited in a river? This was covered in presentation #5 below.

RECOMMENDATIONS: *None*

3. TITLE: Climate variables in the Northwest Atlantic - Potential impacts on Atlantic salmon

PRESENTER: J. B. Dempson (for Eugene Colbourne), Department of Fisheries and Oceans Canada

SUMMARY: The North Atlantic Oscillation (NAO) index for 2009 was slightly above normal indicating a weak arctic air outflow in the Northwest Atlantic. Air temperatures in eastern Newfoundland at St. John's remained well above normal during the winter and spring of 2009, reaching near +3^{o}C above normal in February. The annual sea-ice extent on the Newfoundland and Labrador Shelf during 2009 was slightly below the long-term average for the 15th consecutive year; however there appears to be an increasing trend since 2007. In fact spring (April-June) sea-ice extent was above the long term average the first time since 1994.

Surface water temperatures at Station 27 off St. John's Newfoundland remained above normal during the winter (Jan.-Mar.) of 2009 by >0.5^{O}C. Spring temperatures in 2009 increased over 2007 and 2008 to >0.5^{O}C above normal. Temperature data collected during the spring multi-species assessment surveys off the south coast of Newfoundland generally showed a slight warming compared to 2008. Observations from a mid-summer oceanographic survey indicated that the area of the cold-intermediate-layer (CIL <0°C) shelf water off eastern Newfoundland increased over 2008 but was below normal for the 15th consecutive year off Cape Bonavista. In general, sea-surface temperatures during the spring throughout the Northwest Atlantic show a decreasing trend since the record highs observed in 2006.

Preliminary analyses have shown associations between marine environmental conditions and marine survival of salmon, adult salmon run timing and abundance of both large and small salmon. For example, salmon run-times are significantly correlated with both sea-surface temperature (r^2=0.52) in eastern Newfoundland waters and spring (April-June) sea-ice cover (r^2=0.42) with later run-times associated with cold conditions and extensive ice cover. The latest run time on record occurred in 1991 when ocean temperatures off Newfoundland were at an all time low. The abundances of both small and large salmon for all insular waters of Newfoundland are also highly correlated (r^2=0.52) with sea surface temperatures. More research is required to quantify these relationships. However, based on historical data the

marine environment in Newfoundland and Labrador waters during recent years, except for 2007, were generally favourable for Atlantic salmon.

DISCUSSION:

- There was a discussion on the effects of oceanographic temperatures on ice on salmon at sea. The extent of ice affects distribution of salmon. The larger the area of ice cover, the further salmon are distributed south.

RECOMMENDATIONS:

1. *More research is required to quantify the relationships between sea surface temperatures and ice cover on survival of salmon.*

4. TITLE: Returns to Labrador rivers and harvests of salmonids in various fisheries, 2009

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

SUMMARY: In 2009, returns to four counting fences were enumerated and harvests of salmonids in the food fishery and angling were recorded (preliminary). The 2008 data has been updated for the food and recreational fishery.

In 2009, a total of 280 small and 105 large salmon returned to English River. When compared to 2008 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 67 small and 13 large salmon returned to Southwest Brook (Paradise River). When compared to 2008 small salmon had decreased by 86% while large salmon had declined by 63%. When compared to the previous 6-year mean, small salmon returns decreased by 85% while large salmon returns declined by 65%. A total of 115 small and 10 large salmon returned to Muddy Bay Brook (Dykes River). When compared to 2008 there was a decrease in returns of small salmon by 76% and large salmon by 72%. When compared to the previous 6-year mean, returns of small and large salmon decreased by 73% and 59%, respectively. A total of 1,605 small and 723 large salmon returned to the main stem of Sand Hill River, (exclusive of Northwest Tributary). Returns of small and large salmon decreased by 67% and 9%, respectively compared to 2008. When compared to the previous 6-year mean, small salmon returns decreased by 65% whereas there was no change for large salmon (< 10% change).

Smolt production and sea survival was measured at Sand Hill River, Labrador. Smolt estimates are available for the 2007-2009 and 1970-1973. The smolt estimate in 2009 of 59,661 has declined the last two years but remains about average for all years for which estimates are available. Because Sand Hill River, like some other Labrador rivers, has 2SW salmon, a complete estimate of sea survival is available only from the 2007 smolt class. The total sea survival from that smolt class is 6.85% (smolt to returns of small salmon in year (i) plus returns of large salmon in year (i+1)).

Landings in the four fisheries for Food, Social and Ceremonial (FSC) or subsistence purposes in 2008 increased to 36 tonnes over the previous year value of 26 tonnes (figures unavailable for 2009).

In 2008, angling catches retained and released in Labrador have decreased for small and large salmon over 2007. Angling catch and effort rates in 2008 are similar to 2006. The catch rate, however, is on an increasing trend since 1991.

DISCUSSION:

- There was considerable discussion on the declines in returns of salmon to monitored rivers in Labrador.
- One participant indicated that there are reports that considerable poaching occurs near the mouth of rivers. The response was that most people in Labrador are aboriginal and have a legal access to salmon. There is no evidence of illegal netting near the mouths of monitored rivers. Legal netting occurs in the vicinity of Muddy Bay Brook and a small amount of effort in Sand Hill Cove. This netting is not believed to have caused the reductions in numbers of salmon observed in the rivers.
- Concern was raised that the presentation did not raise concern about the decline in small salmon. The presenter indicated that that the low returns of small salmon in 2009 is not an indication of the numbers that will return in 2010.
- The question was asked regarding the number of years a salmon stock would have to show low returns before recommending a reduction in fishing effort? Since components of a year class spawn over several years, declines in numbers of spawners over three consecutive years would warrant a recommendation for a reduction in exploitation.
- There was concern expressed that the large salmon component in Labrador rivers are still very low in comparison to abundance in the 1970's. These stocks should not be considered healthy even though the numbers of large salmon have increased in the past 15 years. The presenter pointed out that the salmon abundance, in recent years, has increased and he considers the stocks relative healthy compared to the numbers in the 1990's albeit, lower than in the 1970's.
- There was no explanation why the large salmon have not increased to the levels observed in the 1970's. This phenomenon is common to all the Northwest Atlantic.
- Additional rivers need to be monitored to get a better representation of the status of stocks in Labrador. It would be good if the DIDSON sonars purchased in 2008 were used on a large river in Labrador in 2010. If the river cannot be the Eagle as originally intended then another large Labrador river should be chosen.
- There are no salmon stocks being assessed in either the Straits or Lake Melville areas of Labrador. This should be corrected.
- It was good to see the successful smolt count at Sand Hill using the smolt wheels. The smolt monitoring should be continued; however, when possible, the full smolt count should be done.
- About 50% of the previous spawning salmon sampled in the Food Fisheries were repeat spawning 2SW salmon. Thus about 60% of the large salmon harvested in the Food Fisheries were 2SW salmon (virgin 2SW and previous spawners).
- No information was available to determine if the 1SW large salmon sampled in the Food Fishery were maturing or non-maturing fish.
- There was few, if any, Newfoundland origin salmon caught in the Labrador Food Fishery. Historical data indicates that few Newfoundland salmon are in the vicinity of the Food Fishery during the period when the fishery is conducted. There is the possibility that some non-maturing 2SW salmon of Newfoundland origin are caught in the food fisheries.
- There is an expectation that the returns of small salmon will be higher in 2010 than in 2009. Historical data indicate that in the year following a year of very low abundance there is an increase in abundance.
- One participant requested that the by-catches of salmon in the resident food fishery be separated from the directed salmon fisheries for social, ceremonial and subsistence purposes.

RECOMMENDATIONS:

1. *There should be a reduction in exploitation of large salmon in Labrador commencing in 2010.*
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, in particular, rivers in Lake Melville and the Straits areas.*
3. *Studies are required to determine why populations of large salmon are not increasing to levels observed in the 1970's.*

5. TITLE: 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 18th year in 2009. Abundance levels, on average, are below levels achieved prior to the moratorium. Low marine survival, since the late 1980's, continues to be the major factor affecting overall abundance of Atlantic salmon in Newfoundland rivers. Inter-annual variation in marine survival continues to fluctuate widely both among rivers and years as evidenced by the marine survival rates for the 2007 -2009 returns. Overall mean sea survival of the 2008 smolt class from the five monitored rivers was amongst the lowest values observed, with smolt to small salmon survival averaging less than 5%.

Conservation egg deposition was achieved on seven of the 13 rivers assessed. Of the six rivers that did not achieve conservation, four were rivers that have had additional habitat opened for salmon colonization (Exploits, Terra Nova, Northwest and Rocky rivers); the other two rivers were Harry's River and Conne River. Overall there was a decrease in returns of small and large salmon in 2009 compared to 2008. Returns of small salmon increased on seven rivers and declined on six rivers; while, returns of large salmon increased on four rivers and declined on seven rivers as compared to the 1992-2008 mean.

Smolt output declined in four of the five monitored rivers from 2008 to 2009. Sea survival rates of the 2008 smolt class were among the lowest values observed from 1992-2008.

Concern is expressed about the poor status of the salmon stock in Middle Barachois Brook. There was no assessment in 2009; however, the assessment in 2008 indicated that the river was only at 28% of its conservation egg deposition requirements. 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. Concern is noted for the upper section of the Exploits River watershed where the egg deposition dropped by 60 % from 2008 to 2009.

DISCUSSION:

- A participant indicated that the salmon populations in Bay St. George have increased more than in many other rivers in Newfoundland due to the reduction in illegal nets since the Conservation Strategy was introduced in 2002. The presenter indicated that the trends in salmon abundance in Bay St. George are similar to abundance on other rivers.
- A participant asked if there were any management recommendations. The presenter indicated that a decline in abundance during one year is not sufficient to warrant concern

about the long term future of the stocks. However there should be no increase in fishing mortality.

- There is no apparent explanation for why there was a decrease in abundance of salmon in most rivers in Newfoundland in 2009 while no decrease was observed on the Northeast coast.
- There are Conservation Levels established separately for three sections of the Exploits River. The lower Section continues to meet its spawning requirements. Although the abundance of salmon increased on the Exploits River, the number of salmon migrating into the Upper Exploits (upstream from Red Indian Lake dam) declined by about 60% from 2008. Some participants felt that the counts at the three fishways on the Exploits should have been presented.
- One participant suggests that the increase in the returns on the Exploits may be a misinterpretation of the information. It would appear that the returns in 2008 were not as high as it should have been given the increases observed in returns of salmon to other rivers. The presenter concurred that this was a possibility. However, there were improvements to the downstream passage for smolt and kelt which may have been a contributing factor to the increase in numbers of salmon in the Exploits River in 2009; as well as an increase in the number of repeat spawners.
- Concern was raised about the overall low abundance of small and large salmon in Newfoundland rivers; as well, as the lack of improvement in stock levels since 1992. Some participants felt that DFO should be doing more to ensure stocks improve and that there should be a reduction in mortality on salmon stocks below the conservation level, with particular emphasis on the MSW components.
- Considerable discussion took place regarding the abundance of salmon now and prior to the closure of the commercial fishery in 1992. Prior to 1992 the returns of salmon into Newfoundland rivers and the total abundance (before fisheries) were declining. Subsequent to the closure the escapements into rivers and egg deposition have increased; however, there has not been an increase in total abundance as was anticipated. Due to the low sea survival presently being experienced, a marginal increase in egg deposition is unlikely to result in a significant increase in returns.

RECOMMENDATIONS:

1. *Increase the number of Atlantic salmon spawners in the Upper Exploits River.*
2. *There should be no increase in fishing mortality on Newfoundland salmon stocks in 2010.*

6. TITLE: Update biological characteristics Bay St. George Atlantic salmon

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

SUMMARY: Data available (1992-2009) for estimating whole weight, % females, and fecundity in Atlantic Salmon stocks in rivers in the Bay St. George area of insular Newfoundland was reviewed. New estimates of biological characteristics of these stocks were compared to values currently used to determine their status. In general, the new estimates of whole weight and % female were lower than the current default values. A new estimate of fecundity (2000 eggs/kg) was higher than the default value of 1540 eggs/kg. The new values resulted in a 14-61% increase in the percent conservation achieved in rivers assessed in 2008 using the re-calculated default values.

DISCUSSION:

- There was considerable discussion on the derivation of the fecundity estimates from samples taken in summer and those taken in the fall. The value of 2000 eggs/kg was chosen from the Flat Bay fecundity data, which is similar to estimates derived for other rivers by O'Connell et al (2008).
- There are insufficient sample sizes to obtain reliable estimates of biological characteristics for salmon in individual rivers in Bay St. George, except Harry's River (fecundity estimates are not available for Harrys River). When samples from all rivers are grouped, the large number of samples on Harry's River biases the estimates for mean weight and percent female.
- There was 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 Newfoundland. Also these MSW salmon populations are at low levels.
- Using the re-calculated biological characteristics (data from rivers grouped) results in a higher estimate of the percentage of the conservation requirements achieved for all rivers than those derived in previous years assessments.
- Considerable discussion occurred with regard to the appropriate calculation for an estimate of fecundity. There may be a decrease in average weight of salmon from time of entry into the river until spawning. Also atresia is known to occur prior to spawning; thus, there would be fewer eggs/kg in fish in the fall.
- Fecundity estimates in terms of eggs /kg and eggs/cm are available for salmon on Flat Bay Brook.
- It would be appropriate to calculate the length-weight and fecundity relationships using a log-log scale.
- It is important to collect additional river specific biological characteristics data;
- The calculation of egg deposition on rivers outside Bay St. George does not use a fecundity value of 1540 eggs/kg.
- It may be appropriate to develop fecundity estimates based on length, since length does not change from the time fish enter the river and time of spawning.
- One participant felt that it is conceivable that the average size of the salmon ova may have decreased since the earlier studies were completed in the 1960's. There are limited data to evaluate if there were changes in size of eggs over time.
- Percent female changes throughout the run of salmon to the river. Sampling needs to be taken over the entire run of salmon to the river.
- Local ecological knowledge indicates differences in size of small and large salmon among rivers in Bay St. George, and even grouping of stock characteristics from adjacent rivers may be inappropriate.
- Some participants felt that the new values for biological characteristics should be used; however there was no agreement on this issue. Concern was expressed that the values presented might change with additional analysis, and since this parameter value is integral to calculating the status of stocks, it would be prudent to wait for further analysis to determine the most appropriate fecundity estimate to use. It was agreed that a detailed working paper should be presented at the next meeting with consideration to additional analysis. Once values for the biological characteristic are agreed upon, they would be used in future assessments.
- Sufficient data are available for weight, length and percent female for Harrys River; and these should be used in the Harrys River assessment.

RECOMMENDATIONS:

1. *Details of methodology to calculate the biological characteristics to be used in assessing Bay St. George salmon stocks should be tabled in a working paper at the next Regional Stock Assessment meeting for review. Consideration should be given to comparing the fecundity estimate for Flat Bay Brook to fecundity estimates at the time of stripping for all rivers including Exploits, Terra Nova, and Pipers Hole rivers. Length and weight data are available for these rivers. It would be desirable to use egg length relationships for fecundity since there are more data available on lengths of salmon then on weights. Consideration should be given to using raw data in developing the fecundity relationships; and where logarithmic scale is used, both axes should be logged.*
2. *River specific biological characteristics data should be collected in Bay St. George.*

7. TITLE: Looking for common trends and patterns in Atlantic salmon abundance – A preliminary examination

PRESENTER: M. Koen-Alonso, *Department of Fisheries and Oceans*

SUMMARY: Salmon rivers in NL are typically grouped regionally (e.g. Northeast coast of Newfoundland [NEC], South coast of Newfoundland [SC], etc.), and trends in salmon abundance are often reported by merging/integrating information by region. This type of analysis has shown differences in trends among regions (e.g. SC rivers have continued to decline after the moratorium while NE rivers have shown increases in salmon runs). The very nature of the aggregate analysis prevents exploring if individual rivers within these areas actually show common trends or, if they do, which are the rivers that may be driving these common trends. The objective of this work was to explore this issue by: a) searching for common trends among individual rivers within a region, and b) investigating if environmental variables can explain, at least in part, these common trends. Given the exploratory nature of this analysis, the study was focused on NEC and SC regions and only data for small salmon were considered. The analysis covered the period 1984-2009. Since several individual river time series do not cover the entire period, analyses were performed on subsets of the data to: a) maximize the length of the time series to be analyzed, or b) maximize the number of rivers included in the analysis. The existence of common trends was investigated using a combination of two statistical techniques: Minimum/maximum Autocorrelation Analysis (MAFA) and Dynamic Factor Analysis (DFA). The effect of environmental conditions was mainly explored by incorporating environmental variables into DFA models. Signals at two different geographical scales were considered, a local one represented by the average annual sea bottom temperatures in the vicinity of the region, and a system-wide one represented by the annual North Atlantic Oscillation (NAO) index. The Akaike's Information Criterion (AIC) was used to compare models. Results indicate that there are detectable common trends in both regions. These trends are not evident in all rivers, but where they are, they do not appear to be related to river proximity. This suggests "marine-bound" mechanisms underlying these trends. The main trend in NEC suggests an increase in salmon returns between the mid-late 1980s and the mid-late 1990s. The main trend in SC suggests a decline during the same period. There is some evidence of environmental influence in these trends, but this evidence is not consistent. Both local conditions and general ocean/ecosystem state appear to have effects, and these effects vary over time. Environmental signals were stronger in SC rivers; most clearly in the 1986-1996 period.

DISCUSSION:

- The modelling exercise looks promising and continuation of the modelling is encouraged.
- There were a number of questions to clarify the model.

- Although these specific models were not used to compare sea temperatures and NAO index to abundance of other marine species, the changes in salmon abundance are mirrored by other marine species such as cod and capelin. During the mid-1980s to the mid-1990s there were major changes in abundance of many fish species. The factors affecting salmon appears to be also affecting other species as well.
- Consider running the models using other marine water temperatures during specific periods of time; such as the first three weeks when salmon are at sea. There maybe other time periods that could also be tried.
- We know that the marine survival at sea is low; so, evaluating changes in food and feeding, and predation seems reasonable.
- How do you choose factors to be included in the model: e.g. enhancement, seals, aquaculture, predators and prey?
- Consider looking at sea survival rates in relation to sea temperatures and NAO.
- If we remove the Exploits River and Terra Nova River data from the Northeast coast model, then the trend line would be flat.
- Increasing the smolt production would only marginally increase adult returns due to the low survival of salmon at sea (~3% on the south coast).
- One participant asked if it is possible that over the past decades that we have over-harvested the stocks on the south coast to such an extent that we have caused negative genetic effects which have affected their survival rate at sea and thus, not able to rebuild population sizes to historic levels? Currently there is no means to evaluate if this change has occurred.

RECOMMENDATIONS:

1. *The modelling research should be continued, since refinements of the models could enhance capabilities to forecast large changes in sea survival.*

8. TITLE: Changes in angler dynamics in the Newfoundland and Labrador Atlantic salmon recreational fishery, 1994-2008

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

SUMMARY: The licence stub return program began in 1994. Since then, the number of licences issued has declined substantially, falling from 20,000 to 25,000 in the mid-1990s to a low of 14,000 by 2007. An analysis of the licence part of the database, consisting of almost 250,000 records, allowed trends in licence sales and angler age demographics to be examined across specific regions of the Province. Licence sales declined in five of seven regions, but have been increasing in both the Southwest coast and Northeast Avalon (greater St. John's) regions in recent years. Non-resident Canadian anglers, primarily from Nova Scotia, Ontario, and Alberta, have been increasing while numbers of international anglers have declined. Over all years, about 91% of all licences issued went to resident (Newfoundland and Labrador) anglers.

Mean age of anglers has increased consistently across all regions of the Province. The youngest average age of anglers (39.8 years) were anglers from Southeast Labrador, while those with the oldest average age (44.7 years) were from the Southwest coast. Examination of the distribution of anglers showed a substantive decline in anglers less than age 30 whereas those 50 to 69 age category have shown a corresponding increase over time. This lack of "recruitment" of new anglers contributes to the overall decline in licence sales for the Newfoundland and Labrador Region.

By merging the licence database with the stub return dataset provides insight into the regional distribution of anglers fishing on any particular river of interest. For example, Gander River is frequented mostly by anglers from central Newfoundland and the Northeast Avalon (greater St. John's area) while Humber River is commonly fished by anglers from the Southwest coast with similar contributions of anglers from the Northern Peninsula – White Bay area, central Newfoundland, and the Northeast Avalon areas. The time series of data available also illustrates how the regional contributions can change over time.

Reasons for the overall decline in angler participation could be related, in part, to the overall increase in age of anglers, out-migration and the decline in the total population of the Province, and the significant relationship between the increasing value of the Canadian dollar in recent years and the coincidental decline in numbers of international anglers.

DISCUSSION:

- One participant indicated that observations on the rivers indicate that there are more female anglers in recent years. However, the data does not show any dramatic change in percent female anglers although there are annual fluctuations.
- About 80% of the people that bought licences angled.
- Those licensees that do not angle tend not to send in their returns.
- Anglers that voluntarily send in their licence return, tend to have a higher catch and effort than those who do not voluntarily send in their return.
- There are reports of similar reductions in participation, particularly in the younger age groups, in recreational fisheries in other Canadian provinces, the USA and in the United Kingdom.

RECOMMENDATIONS: *None*

9. TITLE: Southwest Pond - Atlantic salmon or trout

PRESENTER: Martha Robertson, Department of Fisheries and Oceans Canada

SUMMARY: Southwest Pond is located in the Greenspond area of Bonavista Bay. The fish harvested from this area have been recognized by anglers as being distinct. People described the fish as being most like Atlantic salmon but smaller and with "stubby" heads. Public concern was raised in the mid-1990s regarding the identity of the fish from Southwest Pond, the perceived high exploitation rate and reduced abundance of these fish, and the trout management plan being applied at that time. A research study was conducted on Southwest Pond by Stephen Sutton, Memorial University (Sutton,1997). Through DNA analysis, the study concluded that the fish from Southwest Pond were Atlantic salmon. The growth and migration pattern of these salmon, as determined though scale and otolith samples, was consistent with that of precocious postsmolt. Atlantic salmon postsmolt from Southwest Pond only spend 2-3 months at sea before returning to spawn and over-winter in freshwater. This short duration feeding at sea results in a smaller body size and younger age at maturation than 1 SW salmon (grilse). The precocious postsmolt life history strategy is common in Newfoundland and represents 2-13% of the returns in Campbellton River. The proportion of these salmon in Southwest Pond is unknown. However, Local Ecological Knowledge data suggests that larger salmon (>45 cm) have almost disappeared from the watershed. Since 2000, the Atlantic salmon in the Southwest Pond watershed have been managed as a Special Trout Management Area.

DISCUSSION:

1. Precocious postsmolt are common in many rivers in Newfoundland, particularly on the Northeast coast; however, the numbers of precocious postsmolt returning to Southwest Pond appears (from reports from local anglers) to be a higher proportion of the total stock than in other rivers in Newfoundland. From the information provided, it appears that a high portion of the population spends less than one year at sea; some fish spend only two or three months at sea before returning to the river to spawn.
2. The participants agreed that the "mystery fish" in Southwest Pond are anadromous Atlantic salmon.
3. There was a discussion as to whether or not this population should be managed as other Atlantic salmon stocks. However, since this is a fisheries management decision, the issue was not pursued.
4. Some participants felt that this stock has a unique sea run component in its life cycle, given that a high portion of the population spends less than one year at sea.
5. There was a discussion as to the possibility of recommending that this stock be managed as a unique salmon stock. There was no consensus.
6. Current regulations require that salmon less than 30 cm have to be released. There was a suggestion that this size limit be reduced to 25 cm, which would allow people to harvest the postsmolt salmon on Southwest Brook. There was no consensus on carrying this suggestion forward as a recommendation.
7. Local anglers feel that the abundance of salmon has decreased.

RECOMMENDATIONS:

1. *Inform Fisheries Management and Aquaculture Branch that the "Mystery" fish in Southwest Pond are anadromous Atlantic salmon. The Atlantic salmon population from the Southwest Pond area appear to have a high proportion of precocious postsmolt returning to freshwater to spawn in the same year that they migrated to sea as smolt.*

10. TITLE: Report on the Atlantic salmon rivers of Newfoundland and Labrador

PRESENTER: R. J. Poole, Department of Fisheries and Oceans Canada

SUMMARY: The number and size range of Atlantic salmon rivers in Newfoundland and Labrador was updated as part of DFO's initiatives to develop the Canadian Stock Status Report on Atlantic salmon in Eastern Canada. It is a "living document" that will be reviewed yearly. The latitude/longitude coordinates are taken at the mouth of the fluvial system. A fluvial system is defined as a river which has its mouth flowing directly into tidal water. A salmon river for purposes of this initiative was defined as any river where anadromous salmon was reported as parr or adult in the reported salmon statistic. Records used to determine a salmon river included angling statistics collected by Fisheries & Oceans, and information from DFO field staff from the Salmonids Section, Fish Habitat Management, and Conservation and Protection groups, as well as information from Aboriginal groups. Candidate rivers were chosen from geographic information maps of the province. In total, 311 out of a total of 364 rivers on the Island of Newfoundland were identified as salmon rivers along with a further 85 salmon rivers out of a total of 366 rivers in Labrador. In 2009, six rivers were added to the list for Newfoundland and four were removed from the list for Labrador. At present, but subject to further review, the Newfoundland & Labrador Region has 396 Atlantic salmon rivers in total.

DISCUSSION:

- The list of rivers with anadromous Atlantic salmon stocks includes the rivers provided by various stakeholder groups.

- Anyone that is aware of a river with a salmon stock that is not listed, should pass the information to Rebecca Poole or David Reddin, Salmonids Section, Science Branch, DFO. The latitude and longitude of the mouth of the river is essential, so that the river can be appropriately located.
- Caution should be used in applying the term Atlantic salmon population, since each river may have one or more salmon populations.
- One participant asked if there was any initiative started to schedule the rivers crossed by the Trans-Labrador Highway. All rivers with anadromous Atlantic salmon crossed by the Trans-Labrador Highway in Southern Labrador are scheduled and classified.
- It was pointed out that all rivers with anadromous Atlantic salmon stocks are included in the River Classification scheme as Class III Rivers, even if they are not Scheduled Salmon Rivers.

RECOMMENDATIONS: *None*

11. TITLE: Preliminary data on the seasonal use of Renews River estuary by salmonids

PRESENTER: L. Warner, MSc. candidate, Memorial University of Newfoundland

SUMMARY: A given population of salmonids may contain both anadromous (sea- run) and resident (non-sea-run) individuals. Anadromy is favoured when individual fitness is greater using multiple habitats than a single habitat. Anadromous individuals may experience greater fitness-related costs, including the increased probability of mortality. However, anadromous individuals have been shown to reach a greater size-at-age and have increased fecundity than resident individuals. This is because marine habitats are more productive than freshwater habitats in temperate latitudes; and, estuary habitats are highly productive and dynamic rearing and feeding grounds.

The Renews estuary was chosen to study the seasonal use of estuary habitat by salmonids. Standardized sampling was being conducted bi-monthly over a 12 month time period. All sampling was being done within a 4-hour time window around peak high tide (when peak high tide was between 9am – 4pm). Each sampling event consists of two days of sampling within each tide window; the second day being a replicate of the first day. Two sites were sampled using a large beach seine, and six additional sites were sampled using gill nets. Gill nets consisted of one 1-inch mesh panel and one 2-inch mesh panel, which were set for < one hour, in order to avoid sampling mortality. Passive Integrated Transponder (PIT) tags were being implanted in most salmonids measuring ≥ 45 mm for mark/recapture. Standardizing sampling methods allowed comparisons at multiple scales, including collection, day, tide-cycle (bi-monthly), monthly and seasonally.

To date, 13 tide cycles (May 1st to Oct 24th) have been sampled and 16 species have been caught for a total of 13821 individuals. Seven hundred and seventy-seven (777) Atlantic salmon, 221 brown trout and 3 brook trout have been caught and 247 PIT tags have been deployed. Most of the Atlantic salmon were caught on May 13th and were part of the smolt run (few PIT tags were implanted in these individuals due to the unlikely event of them remaining in the estuary). Atlantic salmon and brown trout (< 20 per day) were consistently caught throughout the sampling period, with brown trout being consistently more abundant following the smolt run. Two brook trout were caught during the smolt run and one was caught in June. Average fork length of salmonids was greatest during the smolt run, decreased following the smolt run, then steadily increased throughout the sampling period to achieve an average fork

length in October, similar to that of the smolt run. One brown trout that was tagged on August 25th was recaptured on September 22 and achieved 5 mm of growth during that time.

Other work related to the potential benefits of anadromy is also being conducted along the Renews River watershed. Young-of-year salmonids (Atlantic salmon, brown trout and brook trout) were collected from 16 sites (5 below 1st Falls, 5 between 1st & 2nd Falls, 6 upstream of 2nd falls), between the outflow into the Renews estuary upstream to the inflow to Big Butterpot Pond. Otoliths will be removed for micro-chemical analysis in order to identify individuals as the progeny of anadromous or resident mothers. Size (fork length & dry weight) will be compared between individuals from anadromous and resident mothers in order to determine if individuals from anadromous mothers are of higher quality than individuals from resident mothers.

DISCUSSION:

- There was a discussion regarding the number of salmon parr caught while electro-fishing. Atlantic salmon parr were caught while electro-fishing; but, since electro-fishing was directed specifically towards habitat used by young-of-the–year salmonids, very few older salmon parr were capture.
- One participant suggested that the summer water temperatures in Renews River are known to exceed 25^{o}C, which may result in salmon parr migrating to the estuary for a thermal refuge. The presenter indicted that this may occur; however the estuarial temperatures in 2009 approached 25^{o}C.
- Most of the salmon (777) captured in the estuary in May were smolt. One the first day, 703 smolt were captured. Few adipose fin-clipped smolt were recaptured.
- A participant asked if the sampling biased towards smaller fishes? Sampling in the estuary was intentionally designed to minimise the catch of larger fish, i.e. biased towards catching small fish; although some larger fish were captured. Only small meshed gill nets were used; and nets were set for a short duration. The sampling design was to assess seasonal variation in usage of the estuary by fishes. Some large fish were caught. If there were many large brown trout in the estuary then some would have been caught. Sampling of the anglers catch indicates that model length of angled brown trout is about 25 cm.
- One participant indicated that historically larger brown trout were caught. It would appear that the large component has disappeared.

RECOMMENDATIONS: *None*

12. TITLE: Preliminary findings of the Renews River project

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

SUMMARY: Data on Atlantic salmon collected during the Renews River Salmonid Project were presented. Parr densities in the main stem of Renews Rivers were low (25-35/100 sq m) compared to other NL sites. The smolt run for 2008 and 2009 was estimated at 1500-1600 fish comparable to that on Northeast Trepassey. Angling data from DFO's license stub returns suggests that the adult run size is declining. However, reports by anglers indicate that the number of salmon released is increasing. It was estimated that the adult salmon stock is at approximately 50% of the number of spawners required to meet the conservation requirements of Renews River.

DISCUSSION:

- One participant suggested that the estimated number of smolt migrating from Renews River may be an under estimate. One seine haul in the estuary in May captured over 700 smolt. It would appear that the total population of smolt was larger than what was indicated by the number of smolt caught in the fyke net in the river. It is unlikely that one seine haul caught half of the total smolt population. However, a large number of smolt is inconsistent with the catches in the in-river fyke net. There were no data to resolve the discrepancy between the two numbers.
- There are two waterfalls on Renews River. The lower falls is not considered a barrier to upstream migrating large Atlantic salmon or trout. However, the upper falls is believed to be a partial upstream migration barrier during low water levels.
- Fish that stage at the falls are susceptible to illegal fishing.
- Both waterfalls are barriers to upstream migrating juvenile salmon and small trout.

RECOMMENDATIONS: *None*

13. TITLE: Update on SALSEA research vessel survey

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

SUMMARY: A research cruise to the mid-Labrador Sea was conducted during fall of 2009. During the trip 21 sets were made in the Labrador Sea between 55^0N and 58^0N. Fourteen tows were made with the surface trawl and eight postsmolt salmon were caught with the aquarium attached. No postsmolt were caught during tows without the aquarium. Different fishing techniques including adjustments to warp length, vessel speed, length of tow time and time of fishing were tried. Two night tows were done and five postsmolt caught. Two tows and one gillnet set were made in the colder water of the Labrador Current with no salmon caught. The upper portion (20 m to surface) of the water column is extremely productive.

Seven drift net sets of 42 to 48 nets of varying mesh size (2.5-5 inch) were completed in the Labrador Sea. Eighty-four salmon (61 post smolt, 23 adults) were caught with an average time of each set being approximately 16 hours.

Eighty five (85) salmon were sampled for biological, morphometric, and biochemical data. Vemco VR2 sonic recorders were deployed on the rosette sampler and gillnet high flyers but no tagged salmon were recorded on either device.

In spite of the poor weather for fishing surface trawl and gillnets, the SALSEA program objectives of sampling the ecosystem components within the upper 20 m of the water column were achieved. The data from salmon that were intensively sampled, when analysed, will define the characteristics, origin, age, health, and diet of the salmon population in the northern Labrador Sea area. Stable isotope analysis will define the salmon's place trophically in the ecosystem. Other accomplishments were showing that salmon could be caught in the surface trawl at night, and the high productivity and species diversity of the upper portion of the water column in the Labrador Sea. No salmon were caught in sets on the shelf area influenced by the Labrador Current versus fishing sets in mid-Labrador Sea where salmon were commonly caught.

Species caught during surface trawling included salmon, lumpfish, myctophids, jellyfish, amphipods, barracudina, squid, redfish, Atlantic saury, redfish and Greenland halibut. Most

abundant species were lumpfish, myctophids, redfish, salmon and squid. Sections of the survey area were incomplete due to time lost due to bad weather which plagued the trip.

DISCUSSION:

- The salmon caught in the Labrador Sea during this trip appeared to be quite healthy, have good growth and there appears to be an abundance of prey items. It is suggestive that if high mortality of salmon is occurring at sea, then it is occurring before they get to the Labrador Sea, i.e. closer to shore, during early post smolt migration.
- It would be interesting to see the age distribution of the salmon caught in the Labrador Sea in 2009. Since the southern North American stocks have declined, one would anticipate that there would be a corresponding decline in the proportion of younger age fish in the Labrador Sea.
- Telemetry studies currently being conducted by the ASF indicate that post smolt from the southern Gulf rivers pass through the Strait of Belle Isle in July

RECOMMENDATIONS: *None*

14. TITLE: Update on Harrys River Atlantic salmon returns

PRESENTER: S. Styles, Bay St. George Atlantic Salmon Conservation Group

SUMMARY: A report was tabled that stresses the importance of increasing angler presence on rivers as a deterrent to illegal fishing. Harrys River Conservation Working Group was formed in 2002 and a Conservation /Stock Recovery Strategy was implemented in 2003. The numbers of Atlantic salmon returning to Harrys River, 1992-2009, and the percentage conservation egg deposition achieved, 1953-2009, was presented. The total number (years combined) of small and large salmon entering Harrys River, 2002-2009, was 69% and 303% respectively higher than the total number in the preceding 8 years, 1994-2001. The percentage of the conservation egg deposition requirements achieved has also increased considerably since 2002. Low egg depositions were experienced in 2007 and 2009 similar to most other rivers in Newfoundland. The combined efforts of the Harrys River Conservation Working Group, DFO and aboriginal enforcement staff are believed to have been major contributing factors to increasing the numbers of spawners since 2002. It is the view of the Bay St. George Salmon Group that the improvements in salmon returns to Harrys River also occurred in other rivers in Bay St. George.

DISCUSSION:

- The Chair indicated that the report dealt primarily with management issues and so there was no discussion on the presentation.
- The Working Group was commended for its efforts and accomplishments in conserving and restoring the Harrys River salmon stock.

RECOMMENDATIONS: *None*

15. TITLE: Data provided to ICES regarding the status of the NL stocks

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

SUMMARY: Data annually presented at the ICES Working Group on North Atlantic Salmon was reviewed. Total returns of adult Atlantic salmon to all Newfoundland and Labrador rivers are

used by the Working Group to estimate the pre-fishery abundance of 2SW salmon off the coast of Greenland. The estimate of total returns to NL rivers is based on returns of salmon to counting fences in Newfoundland and Labrador, the exploitation rate in the recreational fishery, proportion of the returns that are "large" salmon and the proportion of the returns of large salmon that are 2SW salmon. In Labrador, returns of salmon to the whole area are extrapolated from returns to counting fences corrected for drainage area of the monitored watersheds.

DISCUSSION:

- Estimates of 2SW salmon for Newfoundland rivers are included in the ICES estimates of PFA (pre-fishery abundance).

RECOMMENDATIONS: *None*

OVERVIEW OF THE SAR AND INCLUSION OF RECOMMENDATIONS

The Chair reviewed a preliminary draft of the SAR. He pointed out the "**Context"** paragraph on the first page states that Conservation Requirements are considered threshold reference points and that there should be no human induced mortalities below 100% of conservation.

The Summary bullets were reviewed and the following changes made:

- *In the bullets for the NE and Eastern NF, the years used in the comparisons should be identified*.
- *Check all references to increases and decreases in numbers to ensure that changes within 10% of the 2008 and the mean levels are considered "No change"; e.g. There was no change in the numbers of large salmon in Harrys River compared to 2008.*

In the second line of the "Sources of Uncertainty" on page 17, change the words "*impossible to forecast*" to "*difficult to confidently forecast"* or some similarly wording.

In the **Management advice** section p.18

- paragraph 2 reword as follows: "*The increased…….enforcement have been successful on Bay St. George rivers. DFO should……. 2010."*
- Re-word paragraph 3 as follows: "*Conservation/…….. Science supports such directed fisheries in cases where conservation/sock recovery strategies are in place and annual in-season ……..adjustments."*
- Re-word paragraph 4 as follows: "*Concern ……. was formed and a Conservation/Stock recovery strategy was developed and presented to Fisheries Management.*

In the **Research Recommendations** Section, Re-word the first paragraph to include other areas of Newfoundland and Labrador that require stock monitoring. Identify priority rivers for monitoring. Some participants suggested that monitoring of rivers on the southwest coast should be a priority given the low abundance of salmon on the southwest coast, the presence of the aquaculture industry, and the proximity of the salmon fishery in St. Pierre and Miquelon. Also add recommendations from the Proceedings Report.

MANUSCRIPTS FOR UPGRADE TO RESEARCH DOCUMENTS

- Status of Atlantic Salmon Stocks in Newfoundland –SFAs 3-14A
- Status of Atlantic salmon Stocks in Labrador – SFAs 1-2 & 14B

OTHER BUSINESS

- Current processes and products following CSAS Review (See Presentation 1 above)
- Update on Harrys River Atlantic salmon returns (See Presentation 14 above)

ACTION ITEMS

1. The chair will provide Rick Bouzan with information on the formal process within CSAS for requesting items to be placed on the Salmonid RAP agenda.
2. The counts of Atlantic salmon at the three fishways on the Exploits river should be presented at future RAP meetings.
3. Details of methodology to calculate the biological characteristics to be used in assessing Bay St. George salmon stocks should be tabled in a working paper at the next Regional Stock Assessment meeting for review. Consideration should be given to comparing the fecundity estimate for Flat Bay Brook to fecundity estimates at the time of stripping for all rivers including Exploits, Terra Nova, and Pipers Hole rivers. Length and weight data are available for these rivers. It would be desirable to use egg length relationships for fecundity since there are more data available on lengths of salmon then on weights. Consideration should be given to using raw data in developing the fecundity relationships; and where logarithmic scale is used, both axes should be logged.
4. Anyone that is aware of a river with a salmon stock that is not listed in the compendium of salmon rivers for Newfoundland and Labrador, should pass the information to Rebecca Poole or David Reddin, Salmonids Section, Science. Branch, DFO. The latitude and longitude of the mouth of the river is essential, so that the river can be appropriately located.
5. Prepare Science Advisory Report and Research Documents as identified above.

REFERENCES

Sutton, S. 1997. The Mystery Fish of Bonavista North: A Multidisciplinary Approach to Research and Management of a Unique Recreational Salmonid Fishery in Newfoundland. M.Sc. Thesis, Memorial University of Newfoundland. 120 p.

O'Connell, M. F., J. B. Dempson and D. G. Reddin. 2008. Inter-river, -annual and -seasonal variability in fecundity of Atlantic salmon, *Salmo salar* L., in rivers in Newfoundland and Labrador, Canada. Fisheries Management and Ecology 15: 59-70

APPENDIX 1: Terms of Reference

Meeting of the Newfoundland and Labrador Regional Advisory Process (RAP) on Salmonids November 5-6, 2009
Comfort Inn Airport, 106 Airport Road
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. 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.

Invited Participants

DFO Science, Fisheries Management, Policy & Economics and SARA Program
Government of Newfoundland and Labrador
Parks Canada
Various Non-Governmental Organizations and Associations

[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.

Various Aboriginal Groups
Memorial University of Newfoundland
Various Salmon Working Groups
Various Aquaculture Groups

ANNEXE 2 : Cadre de référence

Réunion du Processus de consultation scientifique régional (PCSR) sur les salmonidés
Les 5 et 6 novembre 2009
Comfort Inn Airport, 106, Airport Road
St. John's, Terre-Neuve et Labrador

Président de la réunion : Chuck Bourgeois, chef de section, Salmonidés, Division des ressources aquatiques, MPO, Région de Terre-Neuve et du 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. La réunion de novembre vise principalement à mettre à jour l'état des stocks et des cours d'eau examinés lors de la dernière réunion d'évaluation et met l'accent sur la mesure dans laquelle les besoins en reproducteurs pour la conservation ont été comblés.

Objectives

Présenter l'information nouvelle sur l'état des stocks de saumon atlantique pour les zones de pêche au saumon (ZPS)[1] 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.

Documents prévus

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

[1] 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.

Annexe 2 : suite du Cadre de référence

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

Atlantic Salmon 2009 Stock Status Update
November 5-6 commencing at 9:00 am
Comfort Inn Airport, 106 Airport Road St. John's

Day 1

0900 - Introduction (Bourgeois)
- review of agenda

0915 - Data Review:
- Definition of conservation for Atlantic salmon (Dempson)
- Marine Conditions – Climatic Variability in the *Northwest Atlantic-Potential Impacts on Atlantic Salmon*- (E. Colbourne and B. Dempson)

1030 - Coffee Break

1045 - Returns to Labrador Rivers (Reddin)
- Harvests of salmonids in various fisheries in Labrador (Reddin)

1200 - 1300 Lunch

1300 -(continued)
- Returns to Insular Newfoundland Rivers, Smolt production and marine survival trends (Bourgeois)
- Update biological characteristics Bay St. George Rivers (Veinott)

1500 - Coffee Break

1515 - Looking for common trends and patterns in Atlantic salmon abundance - a preliminary examination (Koen-Alonso)
- Changes in angler dynamics in the Newfoundland & Labrador Atlantic salmon recreational fishery, 1994 - 2008 (Dempson, Cochrane, O'Connell)
- Southwest Pond – salmon or trout (Robertson)

Day 2

0900 - Listing of rivers of Insular NF and Labrador with salmon populations (Poole)
- Preliminary data on seasonal use of the Renews estuary by Salmonids (Warner)
- Preliminary findings of the Renews River Project (Veinott)
- Update SALSEA research vessel survey (Reddin)

1030 - Coffee Break

1045 - Presentation on data provided to ICES regarding status of NL stocks (Veinott, Reddin, Poole)
- Overview of the SAR and inclusion of recommendations
- Manuscripts for upgrade to Research Documents and Science Advisory Report
- Other Business
  1) Current process and products following CSA review of Science Advisory Report (C. Bourgeois)
  2) Update on the Atlantic salmon returns to Harrys River (Sid Styles)

APPENDIX 4: List of attendees at the Newfoundland and Labrador Region Atlantic salmon stock assessment meeting

NAME	AFFILIATION / ADDRESS	ADDRESS	PHONE/FAX	E-MAIL
Adams, Blair	Department of Natural Resources	Gander	256-1415 / 424-0412	blairadams@gov.nl.ca
Billard, Greg	SAEN		722-9300	coppertopelectric@yahoo.com
Bourgeois, Chuck	DFO, Science	PO Box 5667 St. John's NL A1C 5X1	772-2128 / 772-3578	chuck.bourgeois@dfo-mpo.gc.ca
Bouzan, Rick	Newfoundland and Labrador Wildlife Federation	15 Conran St. St. John's, NL	364-8415	Rbouzan.fmc@nf.sympatico.ca
Dempson, Brian	DFO, Science	PO Box 5667 St. John's NL A1C 5X1	772-4475 / 772-3578	brian.dempson@dfo-mpo.gc.ca
Fleming, Ian	Ocean Sciences Centre	Memorial Univ of NF, St. John's NL A1C 5S7	737-3586	ifleming@mun.ca
Green, Darrell	NL Aquaculture Industry Assoc	PO Box 23176 St. John's NL A1B 4J9	754-2854	dgreen@naia.ca
Hinks, Ross	MFN	PO Box 10 Conne River NL A0H 1J0	882-2470	rhinks@mfngov.ca
Hurley, Kevin	Chief Resource Management, Central Area	4A Bayley St. Grand Falls, NL A2A 2T5	292-5167	kevin.hurley@dfo-mpo.gc.ca
Hustins, Donald	SCNL	20 Linden Place, Apt. 305 St. John's NL A1B 2S8	753-2930	donaldhustins@hotmail.com
Hutchens, Don	SCNL & SAEN	PO Box 29199 St. John's, NL A1A 5B5	722-9300	Don.hutchens@gmail.com Saen@nfld.com
Ivany, Don	Atlantic Salmon Federation	c/o Sir Wilfred Grenfell College Box 2000 Corner Brook, NL A2H 6P9	632-5100 / 652-5100	donivany@swgc.mun.ca

Appendix 4 con't: List of attendees at the Newfoundland and Labrador Region Atlantic salmon stock assessment meeting

King, Wayne	DFO Senior Area Rep, Labrador	Goose Bay	896-6157 896-8419	wayne.king@dfo-mpo.gc.ca
Knight, Len	DFO, Chief Resource Mgmt, Eastern Area	Mount Pearl	772-5845	leonard.knight@dfo-mpo.gc.ca
Koen-Alonso, Mariano	DFO Science	PO Box 5667 St. John's NL A1C 5X1	772-2047	mariano.koen-alonso@dfo-mpo.gc.ca
Kane, Eugene	Renews River Conservation	PO Box 142 Renews, NL A0A 3N0	363-2585	bevekane@hotmail.com
Keating, Dave	RRCA		687-2225	dkeating@nl.rogers.com
Lawlor, James	RRCA	PO Box 134 Renews, NL A0A 3N0	682-1634	erm.marine@nf.sympatico.ca
Oxford, Andrew	FNI	Corner Brook	634-1500	andrew@fni.nf.ca
Penney, Kim	DFO FAM	PO Box 5667 St. John's NL A1C 5X1	772-2045	kim.penney@dfo-mpo.gc.ca
Perry, Robert	Dept. of Environment and Conservation Wildlife Division	117 Brakes Cove Corner Brook NL A2H 7S1	637-2023	robperry@gov.nl.ca
Poole, Rebecca	DFO	P.O. Box 7003, Stn c Happy Valley-Goose Bay, NL A0P 1C0	896-6154	rebecca.poole@dfo-mpo.gc.ca
Porter, Rex	Rapporteur	383 Tolt Road, St. Philips NL A1M P3	895-2154	porterr@nl.rogers.com
Pryor, Miranda	Newfoundland Aquaculture Industry Association	PO Box 23176 St. John's NL A1B 4J9	754-2854	miranda@naia.ca
Penton, Norman	Dept of Fisheries and Aquac	PO Box 340 St. Alban's, NL A0H 2E0	538-8737	normanpenton@gov.nl.ca

Appendix 4 con't: List of attendees at the Newfoundland and Labrador Region Atlantic salmon stock assessment meeting

Purchase, Craig	MUN	Biology Department A1B 3X9	737-4452	cfpurchase@mun.ca
Reddin, Dave	DFO, Science	PO Box 5667 St. John's NL A1C 5X1	772-4484 / 772-3578	brian.dempson@dfo-mpo.gc.ca
Robertson, Martha	DFO Science	PO Box 5667 St. John's NL A1C 5X1	772-4553	martha.robertson@dfo-mpo.gc.ca
Squires, William	RRCA	PO Box 134 Renews, NL A0A 3N0	363-7115	wsquires@nf.sympatico.ca
Slaney, Leon	DFO FAM Chief Resource Management,	PO Box 580 Grand Bank, NL A0E 1W0	832-3014	leon.slaney@dfo-mpo.gc.ca
Styles, Sid	Bay St. George Atlantic Salmon Group	22 Crescent St Stevenville, NL A2N 1R6	643-5416	Skip_ncr@hotmail.com
Tuck, Tony	Newfoundland Outfitters Assoc	22 Riverview Dr. Clarenville, NL A5A 4M9	466-2440 / 466-2536	tony@flyfishinggreyriver.com
Williams, Patricia	DFO Aboriginal Programs	PO Box 5667 St. John's NL A1C 5X1	772-3732	patricia.williams@dfo-mpo.gc.ca
Warner, Lucas	MUN	Biology Department MUN, St, John's, NL A1B 3X9	764-0310	lawarner@mun.ca
Westley, Peter	MUN	Biology Department MUN, St, John's, NL A1B 3X9	737-3465	pwestley@mun.ca
Willcott, Rebecca	Nunatsiavut Governement	1-A Hillcrest P.O. Box 909, Stn B. Goose Bay, NL A0P 1E0	896-8582	Rebecca_willcott@nunatsiavut.ca

APPENDIX 5A: Summary of Status of Atlantic Salmon in English River, SFA 1, 1999 -2009

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]	2009 [2]	MIN [1]	MAX [1]
Total returns to river													
Small	59	367	224	190	108	56	337	484	498	428	280	56	498
Large	48	15	41	31	19	25	28	44	42	51	105	15	51
Recreational harvest (small salmon)													
Retained	5	8	5	1	0	2	0	6	4	4	0	0	8
Released	0	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	0	2
Released	0	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	0	21
Large	0	0	2	2	2	0	0	0	2	0	0	0	2
Spawners													
Small	54	359	209	184	87	54	337	473	491	419	280	54	491
Large	46	15	39	29	17	25	28	44	40	51	105	15	51
Egg conservation requirement													
% met	40	73	63	52	26	26	80	115	115	109	117	26	117

[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

Forecast: No forecast available.

APPENDIX 5B: Summary of Status of Atlantic Salmon in Muddy Bay Brook, SFA 2, 2002 -2009

STOCK: Muddy Bay Brook (Dykes River SFA 2) **Accessible drainage area=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	2009[2]	MIN [1]	MAX [1]
Total returns to river										
Small	106	394	454	520	445	240	474	115	106	520
Large	11	31	28	20	17	14	36	10	10	36
Recreational harvest (small salmon)										
Retained	9	13	30	1	0	0	0	0	0	30
Released	4	2	17	0	0	0	0	0	0	17
Recreational harvest (large salmon)										
Retained	0	0	0	0	0	0	0	0	0	0
Released	2	0	0	0	0	0	0	0	0	2
Spawners										
Small	106	394	454	520	445	240	474	115	106	520
Large	11	31	28	20	17	14	36	10	10	36
Egg conservation requirement										
% met	43	153	173	190	161	90	184	46	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 -2009

STOCK: Southwest Brook (Paradise River SFA 2) **Accessible drainage area = 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	2009[2]	MIN [1]	MAX [1]
Total returns to river													
Small	110	331	323	235	158	615	858	326	303	495	67	110	858
Large	4	43	32	34	16	54	54	35	32	35	13	4	54
Recreational harvest (small salmon)													
Retained	0	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	0
Recreational harvest (large salmon)													
Retained	0	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	0
Spawners													
Small	110	331	321	231	156	615	858	326	303	495	67	67	858
Large	4	43	32	34	16	54	54	35	32	35	13	4	54
Egg conservation requirement													
% met	39	139	110	82	52	201	267	110	102	157	26	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 -2009

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	2009[2]	MIN [1]	MAX [1]
Total returns to river													
Small	2180	2796	3319	3141	3171	4008	7007	4967	3222	4842	1605	1605	7007
Large	730	560	414	561	627	604	875	568	693	795	723	138	875
Recreational harvest (small salmon)													
Retained	279	289	321	155	212	109	177	123	135	95	78	74	321
Released	326	340	702	679	608	647	925	628	464	757	346	326	925
Recreational harvest (large salmon)													
Retained	29	28	20	1	7	1	5	2	1	1	3	0	28
Released	7	14	36	68	60	86	104	30	44	87	97	0	104
Other removals													
Small	0	0	0	0	15	0	0	25	6	8	4	0	25
Large	0	0	0	0	2	0	0	18	6	2	0	0	18
Spawners													
Small	1868	2473	2928	2918	2883	3834	6735	4686	3041	4671	1492	1492	6735
Large	700	531	390	553	612	595	860	538	688	785	710	136	860
Egg conservation requirement													
% met	65	70	74	81	82	101	168	118	89	125	59	34	168
Smolt count									80994	62985	59661	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 & 2009 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 -2009

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

CONSERVATION REQUIREMENT:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008*	2009*	MIN	MAX
Total returns:												
Small	12063	19370	15589	29198	27195	28050	24924	21713	31823	32252	4470	32252
Large	684	1347	890	1336	949	1967	3365	3956	4575	5579	89	5579
Recreational harvest (small salmon)												
Retained	1467	2430	2730	3633	3292	3879	2515	2459	3782	3185	577	4407
Released	2899	2967	3551	2975	2494	5470	4896	3124	2566	3710	1145	5672
Recreational harvest (large salmon)												
Retained	0	0	0	0	0	0	0	0	0	0	0	83
Released	252	289	331	198	153	511	251	483	293	338	0	350
Other Removals	40	59	51	62	11	24	33	40	27	0	0	117
Broodstock removal	0	0	0	0	0	0	0	0	0	0	0	5111
Spawners	10919	17902	13310	26538	24575	25516	25227	22810	32305	34241	2326	34241
Fry Stocked	0	0	0	0	0	0	0	0	0	0	0	6E+06
Egg conservation requirement												
% met	21	34	25	51	47	49	48	44	62	66	6	69
Lower	56	91	56	141	130	83	125	150	124	174	26	215
Middle	16	27	23	39	37	51	40	27	60	53	2	60
Upper	2	5	3	7	2	4	1	2	5	2	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 depositi

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 watersh

Forecast: No quantative forecast available

APPENDIX 5F: Summary of Status of Atlantic Salmon in Campbellton River, SFA 4, 2000 -2009

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

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

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 [2]	MIN [1]	MAX [1]
Total returns to river												
Small	1798	2151	1974	2219	2726	3746	2768	1850	3998	3952	1798	4001
Large	208	119	123	152	161	276	328	487	432	433	119	560
Recreational harvest (small salmon)												
Retained	226	148	136	170	222	145	150	197	335	266	13	365
Released	176	29	57	20	95	17	54	163	186	175	17	372
Recreational harvest (large salmon)												
Retained	-	-	-	-	-	-	-	-	-	-	0	0
Released	51	9	6	0	4	4	4	45	15	30	0	51
Precocious post smolts	208	228	253	147	365	364	121	200	270	142	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	8.3	13.6%	7.24	45.4
Spawners												
Small	1346	1772	1579	1900	2130	3235	2452	1437	3374	3527	1346	3675
Large	203	118	122	152	161	276	327	483	431	430	118	557
Egg conservation requirement												
% met	152	148	138	191	212	328	273	212	382	380	138	328
Smolt count	35596	37170	32630	35089	32780	30123	33304	35742	40390	36722	30123	62050
Kelt count	1597	706	1084	791	713	1329	1883	2006	930	1163	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	8.82%	2.25	10.66

[1] Min and max are for the period of record since 1993.
[2] Preliminary figures for 2009

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

Recreational catches: The recreational catch for 2009 is the mean of 2007 & 2008 until 2009 sub returnn figures are done.

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 2009..

Forecast: No forecast available.

APPENDIX 5G: Summary of Status of Atlantic Salmon in Gander River, SFA 4, 2002 -2009

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	2008 [2]	2009 [2]	MIN [1]	MAX [1]
Total returns to river										
Small	13444	13657	18521	17828	13959	11571	22442	18883	6745	26205
Large	1898	1853	2668	2461	1927	1243	1560	869	473	4815
Recreational harvest (small salmon)										
Retained	1726	1735	1325	1893	1199	489	1374	1256	489	4537
Released	678	664	795	1410	554	146	725	726	146	3323
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	-	-
Released	184	65	58	335	94	46	128	132	46	685
Spawners										
Small	11650	11787	17091	15667	12705	11067	20996	17554	5565	24739
Large	1880	1911	2536	2407	1918	1238	1547	856	473	4794
Egg conservation requirement										
% met	91	96	144	120	87	72	128	103	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 1994-2009 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 2000-2009 were estimated from relationships between counts at the Salmon Brook fishway and total returns to the counting fence for the period 1989-1999. The 2004-2008 mean angling data was used for 2009. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2009.

State of the stock: Conservation requirement in terms of eggs, in 2009 (103%) was 20% lower than in 2008 and 1% higher than the moratorium mean. In terms of small salmon, conservation requirement was met only in 1993. Conservation egg requirement was achieved in nine of the 18 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 1992-2009 occurred in pre-moratorium years.

Forecast: No forecast available.

APPENDIX 5H: Summary of Status of Atlantic Salmon in Middle Brook, SFA 5, 2002 -2009

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

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

Year	2002	2003	2004	2005	2006	2007	2008 ²	2009 ²	MIN ¹	MAX ¹
Total returns to river										
Small	916	1183	1520	1538	1173	1050	2167	1842	626	2625
Large	69	74	88	62	115	141	143	85	13	262
Recreational harvest (small salmon)										
Retained	117	97	190	141	152	141	222	169	84	391
Released	28	29	24	96	75	57	181	87	19	458
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	-	-
Released	1	2	1	5	7	18	9	8	1	33
Spawners										
Small	796	1083	1328	1387	1013	903	1927	1664	461	2342
Large	69	74	88	62	114	140	142	84	13	261
Egg conservation requirement										
% met	101	134	162	163	133	126	237	197	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 1994-2009 are from the License Stub Return System.

Data and methodology: Complete counts are available from a fishway located on the lower river. The 2004-2008 mean angling data was used for 2009. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2009.

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 (89%). 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 2009 were down 15% from 2008 and up 13% from the 92-08 mean.

Forecast: No forecast available.

APPENDIX 5I: Summary of Status of Atlantic Salmon in Terra Nova River, SFA 5, 2002 -2009

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	2008 [2]	2009 [2]	MIN [1]	MAX [1]
Total returns to river										
Small	1435	2271	3006	2417	2546	1674	3575	2503	1127	3588
Large	271	330	397	316	438	241	430	228	56	637
Recreational harvest (small salmon)										
Retained	146	105	134	193	127	174	129	151	105	645
Released	142	133	229	459	353	328	153	304	133	464
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	-	-
Released	7	10	7	45	209	26	30	63	4	209
Broodstock removal [3]										
Small	0	0	0	0	0	0	0	0	0	352
Large	0	0	0	0	0	0	0	0	0	44
Spawners										
Small	1311	2179	2885	2232	2420	1514	3463	2362	815	3542
Large	271	329	397	311	418	238	427	222	56	588
Egg conservation requirement										
% met	28	42	54	42	47	29	62	40	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 1994-2009 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 2003-2008 mean angling data was used for 2009. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2009.

State of the stock: The proportion of conservation requirement achieved in 2009 (40%) was 35% lower than in 2008, 5% higher than the moratorium mean and 15 lower than the 04-08 mean. Although this river has never achieved conservation requirement, egg depositions during the moratorium years 1992-2009 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), SFA5, 2000-2009

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	2009	Min	Max
Total returns:												
Small	272	102	443	1,012	1207	1210	783	675	1,257	448	102	1257
Large	106	50	114	273	265	305	197	94	229	121	50	305
Recreational Harvest(small salmon)												
retained	0	0	0	51	65	78	62	33	100	32	0	100
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
Other removals												
Small	2	0	1	2	3	13	17	19	39	11	0	17
Large	0	0	1	0	1	3	8	3	0	0	0	8
Spawners												
Small	270	102	442	959	1163	1119	704	623	1,178	424	102	1178
Large	106	50	113	273	264	302	189	92	229	121	50	302
Conservation Requirement												
% eggs met	27	11	37	81	92	93	58	50	92	37	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 since 2003 has been provided by Parks Canada. In 2009 the counting fence operated up to Aug 20 and an estimate was provided to the end of August.

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. In 2009 there were 118 fish with net marks, the highest since 2000.

Forecast: No forecast available.

APPENDIX 5K: Summary of Status of Atlantic Salmon in Northeast Brook (Trepassey) SFA 9, 2002-2009

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	2007	2008 [2]	2009 [2]	MIN [1]	MAX [1]
Total returns to river										
Small	65	115	70	69	76	37	97	49	37	158
Large	2	11	11	5	5	3	4	1	2	41
Recreational harvest (sm. salmon)										
Retained										
Released										
Recreational harvest (lg. salmon)										
Retained										
Released										
Spawners										
Small	65	115	70	69	75	37	97	49	37	158
Large	2	11	11	5	5	3	4	1	2	41
Egg conservation requirement										
% met	156	303	198	173	185	101	232	114	92	368
Smolt count	2076	1064	1571	1384	1385	1777	1868	1600	792	2076
% Sea survival										
(Adult return year)	7.1	5.5	6.6	4.4	5.5	2.7	5.5	2.6	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 2009 (114%) is 51% lower than 2008 and 41% lower than the moratorium mean. In terms of small salmon, 2009 was the fourth year in the time series that percentage of conservation requirement was not achieved. 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 on record (2.6%) occurred in 1992 and again in 2009.

Forecast: No forecast available.

APPENDIX 5L: Summary of Status of Atlantic Salmon in Rocky River, SFA 9, 2001-2009

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	2009	MIN [1]	MAX [1]
Total returns to river											
Small	233	276	402	169	427	352	174	695	498	80	695
Large	60	78	73	235	95	56	35	56	34	1	235
Recreational harvest (small salmon)											
Retained	N/A	0	0	0	0	0	0	0	0	0	0
Released	N/A	5	5	0	6	0	0	0	0	0	5
Recreational harvest (large salmon)											
Retained	N/A	0	0	0	0	0	0	0	0	0	0
Released	N/A	0	0	0	2	0	0	0	0	0	0
Broodstock removal	0	0	0	0	0	0	0	0	0	0	76
Spawners											
Small	233	276	401	169	426	352	174	680	494	158	680
Large	60	78	73	235	95	56	35	56	33	1	89
Fry stocked	0	0	0	0	0	0	0	0	0	81983	434500
Egg conservation requirement											
% met	31	38	50	51	55	42	22	76	54	17	76
Smolt count	9392	10144	4440	13047	15847	13200	12355	18338	14041	4440	18338
% Sea survival											
(Adult return year)	3	3	4	4	3	2.2	1.3	5.6	2.7	1.8	5.6

[1] Min and max are for the period of record since 1987.
[2] Preliminary
smolt to adult survival for 2001 -2009 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.

APPENDIX 5M: Summary of Status of Atlantic Salmon in Little River, SFA 11, 2000 -2009

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	2009	Min[1]	Max[1]
Total returns:	616	161	528	335	687	231	162	47	74	232	61	801
Small	564	125	487	322	656	216	136	39	71	231	55	674
Large	52	36	41	13	31	15	26	8	3	1	1	127
Recreational Harvest(small salmon)	-	-	-	-	-	-	-	-	-	-	-	-
retained	-	-	-	-	-	-	-	-	-	-	-	-
released	-	-	-	-	-	-	-	-	-	-	-	-
Recreational Harvest(large salmon)	-	-	-	-	-	-	-	-	-	-	-	-
retained	-	-	-	-	-	-	-	-	-	-	-	-
released	-	-	-	-	-	-	-	-	-	-	-	-
Other removals	3	0	6	0	0	0	0	1	1	3	0	19
Small	3	0	5	0	0	0	0	1	1	3	0	18
Large	0	0	1	0	0	0	0	0	0	0	0	2
Brood stock removals:	352	0	0	0	0	0	0	0	0	0	0	352
Spawners	261	161	522	335	682	230	160	46	73	229	26	687
Small	N/A	125	482	322	652	216	135	38	70	228	13	656
Large	N/A	36	40	13	30	14	25	8	3	1	3	125
Fry Stocked	298458	288897	0	0	0	0	0	0	0	0	0	306180
Conservation Requirement	263	69	224	144	293	99	69	20	31	98	20	295
% eggs met												
Smolt Count	2703	4983	9963	8570	4640	1283	753	1159	4984	5467	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, 2003 -2009

STOCK: **Conne River (SFA 11)** Drainage Area 602 km²

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

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

Year	2003	2004	2005	2006	2007	2008	2009 [2]	MIN [1]	MAX [1]
Total returns to home waters									
Small	1953	3818	1978	2623	1174	2823	1828	1173	10155
Large	51	175	105	170	49	144	67	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	180	444	75	395	0	385	294	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	1770	3366	1898	2210	1167	2411	1521	1286	7823
Large	51	174	105	168	49	144	67	51	488
Management Target									
% met	42	97	51	61	31	65	40	30	219
Egg conservation requirement	76	174	92	110	55	117	72	55	394
% met									
Smolt estimate	71479	79667	66196	35146	63738	68242	63512	35146	100983
% Sea survival (Adult return year)	2.4	5.3	2.5	4.0	3.3	4.4	2.7	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 only 40% achieved in 2009. 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, with only 72% attained in 2009. Returns of adult salmon in 2009 decreased by 35% from 2008 and was the fourth lowest return in 24 years. Sea

Forecast: Smolt estimates for 2009 are again comparable with previous values at about 63,500. Thus, a marine survival of 3.9% 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 Harry's River, SFA 13, 2002 -2009

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	2008[2]	2009[2]	MIN [1]	MAX [1]
Total returns to river										
Small	1640	2334	2828	2495	3004	1394	3526	2165	888	3526
Large	285	422	498	453	680	289	398	365	16	676
Recreational harvest (small salmon)										
Retained	-	91	223	163	209	135	409	228	2	409
Released	400	237	534	485	1283	170	500	594	23	1411
Recreational harvest (large salmon)										
Retained	-	-	-	-	-	-	-	-	0	0
Released	75	132	266	139	216	110	236	193	28	266
Spawners										
Small	1600	2211	2543	2279	2662	1241	3064	1877	573	3198
Large	277	403	470	439	658	276	374	346	13	661
Egg conservation requirement										
% met	60	84	98	89	116	55	110	72	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 2003-2009 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 2009 were determined from a counting fence operated at Gallant's from May 30-August 23, snorkel surveys conducted below the fence site in August 2006-2008 and angling removals below the fence. 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 1993-2009.

State of the stock: The conservation requirement attained in 2009 (72%) is 35% lower than in 2008, 23% lower than the 04-08 mean and 19% higher than the 92-08 mean..

Forecast: No forecast available.

APPENDIX 5P: Summary of Status of Atlantic Salmon in Torrent River, SFA 14, 2002 -2009

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	2008 [3]	2009 [3]	MIN [1]	MAX [1]
Total returns to river [2]											
Small		4861	3955	5110	4342	4030	2979	5847	2758	96	7475
Large		432	341	549	780	1431	519	1298	1406	7	1430
Recreational harvest (small salmon)											
Retained		822	588	674	455	574	384	581	534	137	822
Released		1299	695	854	1084	718	361	705	744	76	1299
Recreational harvest (large salmon)											
Retained		-	-	-	-	-	-	-	-	-	-
Released		111	107	128	92	115	59	48	88	28	224
Specimens collected below fishway:	**Small**				126		20		46		
	Large				0		13		29		
Spawners											
Small		3909	3297	4351	3653	3384	2539	5195	2104	121	6923
Large		421	330	536	771	1419	500	1293	1368	3	1419
Egg conservation requirement											
% met		597	496	686	675	844	458	1203	749	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 1985-2009.

State of the stock: The total returns of small salmon to Torrent River in 2009 were 53% lower than in 2008. 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 2009, but was 38% lower than 2008 and 5% above the moratorium mean.

Forecast: No forecast available.

APPENDIX 5Q: Summary of Status of Atlantic Salmon in Western Arm Brook, SFA 14B, 2002-2009

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	2008 [3]	2009 [3]	MIN [1]	MAX [1]
Total returns to river										
Small	1465	1406	1151	1019	1300	793	1920	1063	233	1920
Large	48	23	74	43	44	17	15	21	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	26	0	346
Large	0	2	1	1	1	0	0	0	0	3
Spawners										
Small	1463	1386	1149	989	1278	779	1907	1037	117	1907
Large	48	21	73	42	43	17	15	21	0	128
Egg conservation requirement										
% met	510	466	425	355	446	258	611	341	30	625
Smolt count	14999	12086	17323	8607	20826	16621	17444	18492	6232	23845
% Sea survival [2]										
(Adult return year)	9.1	9.4	9.5	5.9	15.1	3.8	11.6	6.1	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 1971-2009. 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 2009 was 44% lower than in 2008 and 10% lower than the 92-08 mean. Smolt production in 2009 was 6% higher than in 2008 but 22% lower than the maximum production value (23845) achieved in 1997. The 2009 sea survival was down 47% from 2008 and 23% from the 92-08 mean.

Forecast: No forcast available.

APPENDIX 6: Copy of presentation, by the chair, on current processes and products following the CSAS review

SLIDE 1

DFO Peer Review and Advice:

Current processes and products following the CSAS review

SLIDE 2

At a glance:

- DFO Science advisory process is well established, and provides the basis for policy and management options and decisions.
- Canadian Science Advisory Secretariat (CSAS) coordinates the DFO Science advisory process, including publication of advice.
- Science advice is produced via a variety of processes; across a range of scales from Regional to National.
- Approach is based on Government of Canada's Framework for Science and Technology Advice: Guidelines for Scientific Advice for Government Effectiveness (SAGE).
- Over 200 Science publications per year; derived from about 100 workshops and meetings per year (2005-2007).
- Science advisory demands changing over time. Greatly increased demands from newer clients (SARA, Oceans, Habitat), added to historic demands (FAM).

SLIDE 3

Based on the Government of Canada *Scientific Advice for Government Effectiveness* (SAGE) Principles*

- Early Issue Identification (proactive)
- Ensure inclusiveness (expertise and perspectives)
- Sound Science & Science Advice (rigorous, professional)
- Uncertainty and Risk (assess & communicate)
- Transparency and Openness (public science documents, how science taken in account is explained)
- Periodic reviews (updates based on new knowledge)

*see http://strategis.ic.gc.ca/epic/internet/inrti-rti.nsf/vwapj/stadvice_e.pdf/$FILE/stadvice_e.pdf

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APPENDIX 6 con't: Copy of presentation, by the chair, on current processes and products following the CSAS review

SLIDE 4.

- **The Science peer review process creates timely products that meet Departmental priorities, support important management decisions and help guide policy development.**

  - **Fisheries:** stock assessments for commercially important species (cod, snow crab, marine mammals, etc.), benthic impacts (trawling).
  - **Aquaculture**: sea lice, pathways of effects, etc.
  - **Habitat:** measuring mitigation measures, evaluating in-stream flow needs, pathways of effects, dams and reservoirs, etc.
  - **Oceans:** guidance for establishing marine protected areas, conservation objectives, ecosystem indicator development, impact of seismic activities, etc.
  - **SARA:** advisories linked to SARA legal listing process, recovery assessments and planning, pre-COSEWIC assessments, etc.

SLIDE 5.

Aims to ensure:

- That a consistently high standard of technical evaluation is applied to all science data and analyses.
- That objectivity is maintained, bias in interpreting results eliminated, the weight of evidence assessed with regard to options and potential consequences.
- That experiential knowledge is evaluated with similar objectivity and rigour through methods appropriate to the type and sources of information.
- That the process is adequately inclusive, with a diversity of experts and perspectives who examine all the material.

SLIDE 6.

1. Submission of Request for Advice by client sector.
2. Evaluation of Advisory Requests and Capacity to Deliver (Risk-based evaluation of requests - proposed).
   If relevant and achievable then:
3. Establish Terms of Reference (TORs).
4. Conduct formal peer review.
5. Develop Science advice.
6. Develop Science products/reports.
7. Publish Science advice (for clients).

APPENDIX 6 con't: Copy of presentation, by the chair, on current processes and products following the CSAS review

SLIDE 7.

Science Advisory Reports (*Advice*)

- SARs are how Science advice is formally provided to a client (Sector) and communicated to the public.
- Need to be accessible to a wide range of audiences.
- *Advice* requires substantial interpretation of factual results and/or syntheses of diverse types of information.
- *Advice* often describes the likely consequences of different options available to managers.
- Example: Recovery potential assessment for basking shark.

SLIDE 8.

Proceedings

- Proceedings capture the discussions and progression within the peer review or advisory meeting.
- Proceedings do not constitute Science advice.
- Proceedings should be produced as a record of discussion leading to consensus for all scheduled event.
- Proceedings should include the TORs, agenda, list of participants as annexes.
