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Newfoundland and Labrador Region

Région de Terre-Neuve-et-Labrador

Proceedings of the Newfoundland and Labrador Region Salmonid Stock Assessment Meeting

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

**November 2-3, 2010
St. John's NL**

**Les 2 et 3 novembre 2010
St. John's (Terre-Neuve-et-Labrador)**

**Meeting Chairperson: C. Bourgeois
Editor: R.J. Poole**

**Président de réunion : C. Bourgeois
Rédacteur : R.J. Poole**

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June 2013

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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 contenues dans le présent rapport puissent être inexacts ou propres à induire en erreur, elles sont quand même reproduites aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considérée 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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SUMMARY

The 18th annual Salmonid Stock Assessment Meeting for the Newfoundland and Labrador Region was held in St. John's, NL, November 2-3, 2010, at the Battery Hotel. Fisheries and Oceans Canada (DFO) science staff provided a regional overview of Newfoundland and Labrador Atlantic salmon (*Salmo salar*) stocks based on scientific data compiled during 2010, as well as, updates of the 2009 data. Marine conditions off Newfoundland and Labrador in 2010 were provided by the Biological and Physical Oceanography Section of DFO. A presentation on the historical basis for determining reference levels was given in the context of the conservation of the Atlantic salmon resource. Annual returns of adult Atlantic salmon and trends in returns were assessed on 13 rivers in insular Newfoundland and three in Labrador. From these assessments the percent conservation egg deposition achieved on each river was determined and used as an indicator of stock status. Seven of the 16 (44 %) Atlantic salmon stocks assessed in Newfoundland and Labrador achieved the conservation egg limit. Smolt production estimates were presented for five rivers in Newfoundland and one in Labrador and used along with adult returns to estimate at sea survival. Harvests of salmonids in Labrador in 2009 were presented for resident and aboriginal food fisheries and recreational angling. Three more points of interest added to the agenda were research on Ten Mile Lake by the Provincial Department of Environment and Conservation, an update from the Bay St. George and Harry's River Salmon Working Groups, and an update from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) on Atlantic salmon. The following proceedings report summarizes the presentations and provides recommendations and comments by participants. An account of the general status of Atlantic salmon stocks in Newfoundland and Labrador in 2010 is given. The meetings Terms of Reference, agenda, a list of attendees, and detailed summary sheets for the various salmon stocks assessed are appended.

SOMMAIRE

La dix-huitième réunion annuelle sur l'évaluation des stocks de salmonidés de la région de Terre-Neuve-et-Labrador s'est tenue les 2 et 3 novembre à St. John's, Terre-Neuve-et-Labrador, à l'hôtel Battery. Le personnel scientifique de Pêches et Océans Canada (MPO) a donné un aperçu régional des stocks de saumon de l'Atlantique (*Salmo salar*) à Terre-Neuve-et-Labrador se fondant sur les données scientifiques compilées en 2010, ainsi que des mises à jour sur les données recueillies en 2009. En 2010, la Section d'océanographie biologique et physique du MPO a fourni les conditions maritimes de Terre-Neuve-et-Labrador. On a alors réalisé une présentation sur les fondements historiques servant à déterminer les niveaux de référence dans le contexte de la conservation du saumon de l'Atlantique. On a évalué les montaisons annuelles ainsi que les tendances de montaison des saumons de l'Atlantique adultes dans 13 rivières sur l'île de Terre-Neuve et dans trois rivières à l'intérieur de la péninsule du Labrador. On a ensuite calculé le pourcentage de la ponte nécessaire à la conservation pour chacune de ces rivières pour servir d'indicateur de l'état des stocks. Les besoins pour la conservation ont été comblés pour sept des seize stocks de saumons atlantiques (44 %) évalués à Terre-Neuve-et-Labrador. On a aussi présenté les estimations de la production des saumoneaux pour cinq rivières de l'île de Terre-Neuve et une de la péninsule du Labrador; ces estimations, avec les montaisons des adultes, ont servi à estimer le taux de survie en mer. En 2009, la pêche à la ligne récréative et la pêche de subsistance des salmonidés ont été permises pour les résidents et les Autochtones dans la péninsule du Labrador. Il y a eu trois nouveaux points d'intérêt à l'ordre du jour : les recherches menées dans le lac Ten Mile par le ministère provincial de l'Environnement et de la Conservation, les nouvelles de la part des groupes de travail sur le saumon de la baie St-George et de la rivière Harry's et les nouvelles sur le saumon de l'Atlantique de la part du Comité sur la situation des espèces en péril au Canada (COSEPAC). Le compte rendu suivant résume les présentations et fournit les recommandations et les commentaires formulés par les participants. Il présente aussi l'état général des stocks de saumon de l'Atlantique de Terre-Neuve-et-Labrador en 2010. Vous trouverez en annexe le cadre de référence de la réunion, l'ordre du jour, la liste des participants et des fiches sommaires détaillés.

INTRODUCTION

The 18th annual Newfoundland and Labrador Region Salmonid Stock Assessment meeting was held at the Battery Hotel in St. John's, November 2–3, 2010, to review information on the status of Newfoundland and Labrador Atlantic salmon (*Salmo salar*) stocks in 2010 and to update 2009 data. There were a total of 12 presentations given; three were added to the agenda at the beginning of the meeting.

This report provides information concerning the status of Atlantic salmon stocks, comprising Salmon Fishing Areas (SFAs) 1-14B, in Newfoundland and Labrador in 2010. The definition of consensus was given at the beginning of the meeting. A consensus occurs when all participants agree which conclusion has the most scientific merit. If the group has two conclusions it is advised to choose the conclusion with the most scientific merit. If a single conclusion still cannot be agreed upon then the two conclusions are to be reported along with advice on how these conclusions were met.

Summaries of each of the presentations with comments and recommendations are given. The meeting Terms of Reference are provided in Appendix 1. A copy of the agenda for the November 2010 meeting is provided in Appendix 2. Participants attending the assessment sessions, in whole or in part are listed in Appendix 3. In addition to Fisheries and Oceans Canada (DFO) scientific staff, the meeting was attended by invited participants from: DFO Fisheries Management, DFO Policy and Economics, DFO SARA Program, DFO Scientist Emeritus, Government of Newfoundland and Labrador, Memorial University of Newfoundland, Parks Canada, Miawpukek First Nation, Nunatsiavut Government and various Non-Government Organizations and Associations.

Twelve (12) salmon stocks were assessed relative to conservation requirements in insular Newfoundland (plus three sections for Exploits River); and three Labrador stocks (English River, Paradise River, and Sand Hill River). Results of the assessed rivers are provided in the Summary Sheets in Appendix 4.

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 2010/087](http://www.dfo-mpo.gc.ca/csas/Csas/). CSAS Publications are available in Portable Document Format (PDF) at <http://www.dfo-mpo.gc.ca/csas/Csas/>.

SUMMARY OF SALMON STOCK STATUS 2010

NEWFOUNDLAND AND LABRADOR REGION (SFAS 1-14B)

- Low marine survival since the late 1980s continues to be the major factor contributing to the overall low abundance of Atlantic salmon within the region. Inter-annual variation in the index of marine survival continues to fluctuate widely as evidenced by the marine survival of the 2007-2010 returns.
- The index of abundance of small and large salmon in insular Newfoundland for 2010 was above the previous five year mean (2005-2009). However, the previous five year mean remains below the pre-moratorium index of abundance for both small and large salmon.

-
- In Labrador, returns of small and large salmon declined from the previous six year mean. 2010 was the second year of lower small salmon returns and is of concern. Of particular importance would be a three year consecutive decline that represents a generation of spawners and could considerably reduce production of future smolt classes. Abundance of large salmon has remained particularly low since the late 1980s.
 - Seven of the 16 (44 %) Atlantic salmon stocks assessed in Newfoundland and Labrador achieved the conservation egg limit. Conservation was not achieved in any of the three rivers assessed in Labrador and the mean limit achieved was 65 %.

LABRADOR (SFA 1-2 AND14B)

- Abundance levels of large and small salmon in Labrador, on average, are below levels achieved prior to the moratorium. Low marine survival, since the late 1980s, continues to be the major factor affecting overall abundance of Atlantic salmon within the Labrador portion of the region.
- In 2010, numbers of small and large salmon were below the previous six year mean. The 2010 index of abundance of large salmon decreased to one of the lowest levels on record and is below the long-term mean. There remains concern regarding the low level of large salmon spawners in Labrador.
- Conservation spawning requirements for Labrador rivers have been defined as 190 eggs per 100 m² of fluvial habitat which is assumed to include lacustrine habitat.
- As a result of high water conditions, the counting fence at Sand Hill River was installed later than normal (approximately 2-3 weeks) and returns were adjusted accordingly.

NEWFOUNDLAND (SFAS 3-14A)

- Returns of small and large salmon in 2010 were some of the highest since the closure of the commercial fisheries in 1992. Compared to the previous five year mean (2005-2009), small salmon returns increased on 12 rivers and decreased on one, whereas, large salmon returns increased on seven and decreased on six. The index of abundance of small and large salmon was above the previous five year mean in insular Newfoundland.
- Conservation egg limit was achieved on seven of 13 assessed rivers. Four of the six rivers that did not achieve conservation have had newly opened habitat (Exploits, Terra Nova, Northwest, and Rocky rivers). The remaining two rivers that did not achieve conservation were Conne River (69 %) and Harry's River (94 %).
- Compared to the previous five year mean (2005-2009), sea survival increased on three of the five monitored rivers. The index of marine survival for 2010 was above the previous five year mean. The direction of change for smolt production was variable among the assessed rivers.

PRESENTATION SUMMARIES

CLIMATE VARIABILITY IN THE NORTHWEST ATLANTIC, UPDATE FOR 2010 - POTENTIAL IMPACTS ON ATLANTIC SALMON

Presenter: E. Colbourne, Fisheries and Oceans Canada

Summary

The North Atlantic Oscillation (NAO) index for 2010 was at a record low, indicating below normal arctic air outflow in the Northwest Atlantic. As a result air temperatures in Newfoundland and Labrador were well above normal, reaching near +8 °C above normal during the winter and 1.8 °C above normal during spring at Cartwright on the mid-Labrador Coast. The annual sea-ice extent on the Newfoundland and Labrador Shelf during 2010 was below the long-term average for the 16th consecutive year; in fact it was the lowest on record during the winter months and the 5th lowest during spring. This was in contrast to the spring (April-June) sea-ice extent in 2009 which 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 (January-March) of 2010 by near 1.5 °C. Spring surface temperatures in 2010 increased over 2007-2009 to 0.9 °C above normal while bottom temperatures were the 2nd highest on record at near 1 °C above normal. Temperature data collected during the spring multi-species assessment surveys off the south coast and on the Grand Banks of Newfoundland generally showed a warming trend compared to the past several years. Observations from spring and summer Atlantic Zone Monitoring Program (AZMP) oceanographic surveys indicated that the area of the cold intermediate layer (CIL <0 °C) shelf water off eastern Newfoundland decreased over 2009 to the second lowest on record in some areas. In general, sea-surface temperatures during the winter and spring off Newfoundland and throughout much of the Northwest Atlantic increased over 2009 values.

Analyses have shown strong associations between 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 ($r=0.7$) in eastern Newfoundland waters and spring (April-June) sea-ice cover ($r=0.6$) 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 particularly large salmon for all insular waters of Newfoundland are highly correlated with sea surface temperatures and climate conditions in general. More research is required to quantify these relationships. However, based on historical data the marine environment in Newfoundland waters during recent years, except for 2007, were generally favourable for Atlantic salmon.

Comments

- The data presented gives an explanation for the low returns to rivers in Bay St. George in 2007, as it correlates with the ice conditions and cold temperatures.
- The runs were not late in Harry's River this year they were on time or early.
- Did anyone try to incorporate the indices of smolt abundance as well as environmental variables (conditions) into a multivariate model - this approach was not tested. The best correlation is between Sea Surface Temperatures and large salmon returns to insular Newfoundland.

-
- Anthropogenic events play a very big part in salmon survival.
 - In 2010, Labrador experienced extreme northeast (NE) wind and ice conditions at the end of June to early July with high winds pushing 2, 3, and 4 year old ice on the coast. A real anomaly in sea ice. The ice chart for June 21 showed that the ice was tight to coast from Battle Harbour to Cape Childley. Ice seemed to develop from June 1 onwards in Labrador. Runs were early on North coast down to southeast but did not seem to impact Pinware. Then the runs stopped. We also had extremely high water levels in June.
 - There is a lag between run timing and availability of sea ice data.
 - Labrador was quite different from June 1st onward than what the ice charts showed for Newfoundland. We usually see salmon on the coast of Labrador in June but in 2010 we did not see them until July.
 - If you look at the sea ice conditions and whether the run times were early or late may suggest where the salmon are overwintering. Years of heavy ice conditions may cause salmon to move further south causing earlier runs on Newfoundland's south coast and later runs on the northeast coast and in Labrador.
 - Looking at the distribution of recaptured tagged salmon in relation to the ice conditions has shown evidence that years of heavy ice conditions the salmon move further south and may overwinter there.
 - There are so few rivers with the large salmon and multi-sea-winter (MSW) salmon in NL. Due to the correlation that has been shown here for the large salmon and ice conditions we may want to analyze the large and MSW salmon in New Brunswick and Quebec, knowing that they travel through the Labrador Sea area.
 - Historical data from Sand Hill River indicates overlap between smolt and adult run timing. In 2010 at Sand Hill River the smolt run was later than normal suggesting that the adult run timing was late as well.

Recommendations

- This information needs to be looked at and determine how it can be useful to us. Even though information has a lag time of one year it can still be looked at in retrospect to see what the outcomes were.

DATA REVIEW: DEFINITION OF CONSERVATION FOR ATLANTIC SALMON

Presenter: J.B. Dempson, 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, the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) referred to 2.4 eggs/m² 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 some salmon stocks, but in the absence of river-specific relationships an operational translation of conservation was required. Accordingly, egg deposition rates of 2.4 eggs/m² of fluvial (river) habitat and 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, a draft of which was 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, uses the above noted values. It also noted that the further the egg deposition 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.

Comments

- If this policy was adhered to then the recreational fishery would close in Bay St. George. The anglers would not be on the rivers and poaching would become a problem again.
- Conservation limits are used by science to provide advice to Fisheries and Aquaculture Management Branch (FAMB).
- Historically Conne River had a management reference level which was higher than the conservation limit. Management plan for Conne River 15 years ago meant that the river would be closed. Instead it was opened because it had the earliest runtime of salmon. The river was bombarded by fishers.

Recommendations

- Bring back historical management plan for Conne River.

RETURNS TO LABRADOR RIVERS AND HARVESTS OF SALMONIDS IN VARIOUS FISHERIES IN LABRADOR

Presenter: *R.J. Poole, Fisheries and Oceans Canada*

Co-author: *D.G. Reddin, Fisheries and Oceans Canada*

Summary

In 2010, returns to three counting fences were enumerated and harvests of salmonids in the food fisheries and angling fishery are being compiled. The 2009 data for harvests of salmonids in the food fisheries and angling fishery were updated.

In 2010, a total of 285 small and 41 large salmon returned to English River. When compared to 2009 the returns of small salmon remained the same (<10 %) and returns of large salmon had decreased by 61 %. When compared to the previous 6-year mean, small salmon returns decreased by 14.6 % and remained the same for large salmon (<10 %).

A total of 163 small and 17 large salmon returned to Southwest Brook (Paradise River). When compared to 2009, the lowest return rate in the time series, small salmon had increased by

59 % and large salmon by 23 %. When compared to the previous 6-year mean, small salmon returns decreased by 61 % while large salmon returns declined by 54 %.

A total of 2,220 small and 320 large salmon were enumerated at the Sand Hill River counting fence. Returns of small salmon increased by 28 % and large salmon decreased by 56 % from 2009. When compared to the previous 6-year mean, small and large salmon returns decreased by 48 % and 55 %, respectively. Smolt production and sea survival was measured at Sand Hill River, Labrador. Smolt estimates are available for the 2007-2010 and 1970-1973. The smolt estimate in 2010 of 80,000 has increased over the last two years. It is similar to the 2007 estimate, both being the highest on record. Sand Hill River, like some other Labrador rivers, has two-sea-winter (2SW) salmon, therefore, a complete estimate of sea survival is available from the 2007 and 2008 smolt class. The total sea survival from the 2007 smolt class is 6.85 % (smolt to returns of small salmon in year (i) plus returns of large salmon in year (i+1)) and from the 2008 smolt class total sea survival is 3.056 %.

Based on the returns to the three monitored rivers conservation requirements were not met in 2010.

Landings in the four fisheries, three for Food, Social and Ceremonial (FSC) and one for subsistence purposes in 2009, decreased by 18 % over the previous year value of 36 tonnes (figures unavailable for 2010).

In 2009, retained angling catch in Labrador decreased by 35.9 % in small salmon and remained the same for large salmon (<10 %) when compared with 2008. Angling catches for released salmon in Labrador in 2009 have decreased for small (47.7 %) and large (11 %) salmon over 2008. Angling catch and effort rates in 2009 have decreased over the 2008 data.

Comments

- All pertinent information is not available for Labrador when the Regional Advisory Process (RAP) meeting is held i.e. removal data in fisheries.
- The Labrador index of small and large salmon appears to show that the small salmon returns have been cyclic over the years but the large salmon have been declining.
- The information in the index of abundance is a composite which means it does not necessarily apply for every individual river in Labrador. For example, we do not have any counting facilities in Lake Melville and this index may or may not be relevant to those particular stocks. We think in a general sense as a composite that it does apply to Labrador but it does not apply to all individual rivers in Labrador.
- In general and also in Labrador the smolt and adult runs overlap in that the end of the smolt run and the beginning of the adult run overlap. In 2010, we believe we got the bulk of the smolt run. However, in terms of the adult run some salmon may have been missed.
- South West Brook and Sand Hill Brook tend to follow each other in terms of the salmon run timing. South West Brook was installed at the start of the season and there were not any adult salmon at South West Brook until July 5th.
- Due to the high water levels in 2010 the Sand Hill River counting fence was not installed until July 9th. Adjustments were made to the returns on Sand Hill River even though the run time in 2010 appeared to be later. Therefore, the adjusted returns to Sand Hill River may have been over estimated.
- The number of salmon returns on Sand Hill River has declined in 2010. It appears that this has nothing to do with missing fish because of the later installation date, but instead to some other factor (e.g., ice, low abundance).

-
- At Sand Hill River if the water levels are appropriate when it is time to put in the smolt count then we will put in a full fence to get a full count. If not we use a partial fence and use mark recapture to provide an estimate.
 - Even though the index rivers do not show the runs as being early there are other rivers where returns seemed to be much earlier based on personal communications with people in the Food Fisheries, Anglers and River guides.

Recommendations

- Due to the lack of scientific data and the development occurring and being proposed in Labrador there needs to be more investment by DFO into the science of Atlantic Salmon and rivers in NL.

NEW ESTIMATES OF WHOLE WEIGHT, % FEMALES AND FECUNDITY FOR USE IN THE DETERMINATION OF CONSERVATION STATUS OF ATLANTIC SALMON (*SALMO SALAR*) IN ASSESSED RIVERS IN THE BAY ST. GEORGE AREA (SFA 13)

Presenter: G. Veinott, Fisheries and Oceans Canada

Co-authors: N. Cochrane, Fisheries and Oceans Canada

Summary

Data available for estimating whole weight, % females and fecundity in Atlantic Salmon stocks in rivers in the Bay St. George area of insular Newfoundland were reviewed. Suggested new estimates of these stock's biological characteristics were presented. In general, the old default values tended to overestimate average weights and % females, and underestimate fecundity. It was argued that recent and, if possible, river specific data was a better estimate of current biological characteristics. As well, the fecundity value of 1,540 eggs/kg based on Sturge (1968) was considered unsuitable. New fecundity values of 1,880 eggs/kg for small salmon and 1,570 egg/kg for large salmon based on Flat Bay Brook samples were proposed as alternatives to Sturge (1968).

Comments

- DFO needs to put in a better effort to get samples for the biological characteristics.
- DFO has tried in the past to get samples from the recreational fishery but were unsuccessful.
- Not likely to get better data than what we have as we have very limited opportunity to sample large salmon.
- Assuming the biological characteristics of the groups of rivers are the same based on geography may be a false assumption.
- May have to analyze how the rivers should be grouped or if it should be on a river by river basis.
- Bay St. George is the only place on the island where we use Sturges fecundity.
- Depending on the times the samples were taken may cause bias as there are proportion of time when the male go through and another time when the females go through.

HARRY'S RIVER ASSESSMENT: METHODOLOGY

Presenter: *G. Veinott, Fisheries and Oceans Canada*
Co-authors: *N. Cochrane, Fisheries and Oceans Canada*

Summary

The Atlantic Salmon stock assessment on Harry's River is based on a salmon count at the Gallant's counting fence which is approximately at river km 25. Having the fence so far from the mouth of the river requires some estimate of the number of salmon remaining downstream of the counting fence. The primary method used to determine the count downstream of Gallants is a swim through (snorkel) survey. However, the snorkel survey has only been completed twice in the past five years. It was suggested that the uncertainty in past counts from the snorkel survey was too large to be used as an accurate estimate of the uncounted fish in years when the snorkel survey was not completed.

Comments

- There may be a fixed number of salmon downstream of the counting fence but this would appear to be unlikely. If we had more years of data we may be able to calculate the means of the number of salmon above and below the counting fence
- In general, variability does occur year to year, but literature shows that the numbers of fish are usually proportional throughout sections of the rivers.

Recommendations

- We continue the snorkel survey to get more data or we abandon the snorkel survey and find another way to calculate conservation requirements for Harry's River.
- Look for funds to move the counting fence closer to the mouth of the river.

RETURNS TO INSULAR NEWFOUNDLAND RIVERS, SMOLT PRODUCTION AND MARINE SURVIVAL TRENDS

Presenter: *C. Bourgeois, Fisheries and Oceans Canada*

Summary

The commercial Atlantic Salmon fishery moratorium, implemented in insular Newfoundland in 1992, entered its 19th year in 2010. Abundance levels for 2010 on average are close to the seven year mean levels achieved prior to the moratorium. Low marine survival, since the late 1980s, continues to be the major factor affecting overall abundance of Atlantic Salmon within the insular portion of the region. Inter-annual variation in marine survival continues to fluctuate widely as evidenced by the marine survival of the 2007-2010 returns. Overall mean sea survival of the five monitored rivers of the 2009 smolt class was amongst the highest values observed and smolt to small salmon survival averaged less than 6 %.

Conservation egg deposition was achieved on nine of the 13 assessed rivers. Of the 6 rivers that did not achieve conservation 3 were rivers with newly opened habitat (Exploits, Terra Nova and Northwest rivers) while Conne River failed to achieve conservation. Overall there was a increase in returns of small and large salmon over 2008. Small salmon returns increased on 12 rivers and declined on one river while large salmon returns increased on nine rivers and declined on four rivers as compared to the 1995-2009 mean.

Smolt output for the five monitored rivers declined for two of the rivers from 2009 to 2010. Sea survival on the 2009 smolt output was amongst the highest values observed from 1992-2008.

Concern is expressed for Middle Barachois Brook, Conne River, and the upper Exploits River watershed. It is recommended that Science Branch and FAMB conduct investigations to identify the possible causes with a goal to increase the egg depositions in these watersheds.

Overall Science recommends no increases in human induced mortality on stocks below conservation egg deposition.

Comments

- Concern is expressed for Middle Barachois Brook, Conne River, and the upper Exploits River watershed.
- Research is needed to understand biological processes occurring in the marine environment. Where are salmon overwintering? What else can we be doing?
- Interactions between wild and aquaculture salmon need to be identified to determine any impacts.
- The destruction of river systems caused by Hurricane Igor may have impacted fish populations.

Recommendations

- No increases in human induced mortality on stocks below conservation egg deposition.
- Science Branch and FAMB are advised to conduct investigations to identify the possible causes of not achieving conservation egg deposition in Middle Barachois Brook, Conne River, and the upper Exploits River watershed with a goal to increase the egg depositions.
- Research is needed to understand what is happening in the marine environment in terms of smolt production and returns.
- Identify the impact that aquaculture may have on the salmon in these areas of concern.

SYNCHRONY IN RETURNS TO RIVERS IN NEWFOUNDLAND AND LABRADOR

Presenter: *D.G. Reddin, Fisheries and Oceans Canada*

Summary

The purpose of the exercise was to determine if there is synchrony among stocks of Atlantic Salmon and how widespread is it. The analysis is in relation to the review of assessment projects in the province and implementation of the Wild Salmon Conservation Policy. Also at the 2009 RAP the question of synchrony was posed related to the counting fences in Labrador. Two correlation matrices were developed one for small and one for large salmon returns using the data from 27 rivers in Newfoundland and Labrador. Data came from a spreadsheet of returns to various rivers developed for the COSEWIC salmon review based on counting fence data from 1961 to present (2010 data was unavailable at the time the calculations were done). The data included all that is available but the length of the time series varied from river to river. The counting fence data were converted to total returns by adding angling mortalities and correction for out of operation events to the fence counts. For purposes of this analysis, regions were: Labrador, northeast coast, south coast, southwest coast (Bay St. George and Humber), and northwest coast.

There were no correlations exceeding 80 % indicating that the data from any of these rivers could not be used to predict returns to the others. Northeast Coast rivers show the highest degree of synchrony both within and without the region for small and large salmon of any of the five regions in the Province. Coincidentally, these rivers also have the longest time series. Bay St. George data were overall short in length and showed a general lack of synchrony with each other and thus may not serve as indices for the others; although longer time series of data may reveal different results. This does suggest that the snorkel surveys should continue for Bay St. George rivers. For Labrador, small salmon returns amongst the three rivers in southern Labrador were significantly correlated but not for large. The three southern rivers were not correlated with English River in the north. Lack of correlation with distance suggests there is an area surrounding each river where synchrony exists but declines with distance. The area of synchrony appears to be highly variable depending on river and general location.

Comments

- The representative from Bay St. George expressed surprise at the results and did not agree with them in relation to Bay St. George rivers.
- If rivers in a particular area have counting fences then you would have some information on the rivers within that area.
- In areas where counting fences are not present, the only way to get reliable information on these rivers would be to construct a counting fence.
- Upper Lake Melville has a high concentration of fishers and harvest and there is no science being conducted within that area.
- The users and elders do not believe that the counting fences in Labrador are indicative of the numbers of salmon on the coast. They are reporting that there is more salmon presently than ever before.

Recommendations

- Science to collect more information with respect to stock status on the salmon populations in the Lake Melville area.
- Construct another counting fence in northern Labrador to ensure there is a more representative assessment of the salmon population in northern Labrador.

PRE-SPAWNING MOVEMENTS OF ATLANTIC SALMON IN EXPLOITS RIVER USING RADIOTELEMETRY – PRELIMINARY RESULTS

Presenter: *M. Robertson, Fisheries and Oceans Canada*

Co-authors: *C. Pennell, C. Bourgeois, K. Clarke, L. King and W. Eddy (Nalcor Energy)*

Summary

Atlantic Salmon (*Salmo salar*) adults (n = 77) from Exploits River were surgically tagged with radio transmitters to determine migration patterns and distribution of spawners in the middle and upper sections of the river. Four man-made and natural obstructions in this area of the river have the potential to reduce migration efficiency (Goodyears Dam, Red Indian Lake Dam, Badgers Chute, and Little Red Indian Falls). Sixty-seven adults were removed from Grand Falls fishway, tagged, and released above the fishway. Ten adults were tagged and released from Red Indian Lake fishway. Data was collected from July to late October at ten automated receivers placed from Goodyears Dam to Red Indian Lake Fishway. A helicopter survey will be conducted in early November to determine spawning locations. A preliminary review of the data

suggests that fish may experience migration delays at Goodyears Dam, Little Red Indian Falls, and Red Indian Lake Dam. Salmon appear to migrate quickly through Badger Chute up to Little Red Indian Falls. Only one of the 67 adults tagged at Grand Falls migrated to Red Indian Lake. Nocturnal movement increased over the study period from 40 % in July to 80 % in September. Data from hydrometric gauging stations will be used to investigate the influence of flow and water temperature on fish movements.

Comments

- The area below Red Indian Lake Dam, unfortunately only had one of the tagged fish migrate there, but it stayed there for 30 days. It is believed that fish are staying in these cool water conditions and are subject to a lot of angling pressure.

Recommendations

- The area below Red Indian Lake Dam to the steel bridge appears to hold fish. These fish are too important to let them be subjected to angling at the last leg of their journey. It is advised that this area be closed to angling.

SUMMARY OF DIDSON OPERATIONS IN 2010

Presenter: *D.G. Reddin, Fisheries and Oceans Canada*

Summary

The DFO DIDSON sonar equipment was used in a demonstration project during the summer of 2010 on Paradise River, Labrador. It was also used briefly at Renews River, NL to aid in selecting a sonar site on that river. The intention is still to count salmon with the DIDSONs at Eagle River, Labrador but lacking living facilities at Eagle River; Paradise River was chosen as an alternate until facilities are available at Eagle River. Several species images were observed on the sonar including adult salmon and trout, juvenile salmon and trout, salmon and trout smolts, seals, and suckers. Issues for a successful deployment are: staff training in techniques of counting is crucial for accurate results, site surveys for proper site selection in advance of deployment is important, and appropriate equipment to cover the entire river at the site. Problems were encountered with the DIDSON cables and high water which precluded a full count at Paradise River in 2010. At Renews River, a site was selected with the intention of renting equipment in 2011 through the Atlantic Salmon Conservation Foundation as part of a Brown Trout (*Salmo trutta*) project on that river.

Comments

- It was unfortunate that high water and cable breaks prevented a full count.

Recommendations

- If no facility is available at Eagle River, Labrador to use the DIDSONs then the sonars should be utilized on another river within the region.

ADDITIONS TO THE AGENDA

The following three additional summaries were intended as information items only, no documents were reviewed.

RESEARCH PROJECTS IN LABRADOR AND THE TEN MILE LAKE PROJECT

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

Summary

A brief overview of projects being worked on in Labrador was presented. One study examined the Brook Trout from the Eagle River and southern Labrador. An earlier paper suggested that there were two refugia based on species composition. The trout were genetically tested and found that Eagle River trout did differentiate from those in southern Labrador. Samples of longnose sucker (*Catostomus catostomus*) were also collected along southern Labrador and this study is continuing.

Another study in the Fraser River eco-region examined northern climate change to compare shallow barren ground lake fish and deep water fjord lake fish. Were these fish using the entire watershed or were they sedentary? Was there a different preference in water temperature of these fish? It was found that the fish take advantage of the temperature difference in pools and streams being cooled by springs and snow melt. If climate change decreases the amount of snow melt what impact will it have on this critical habitat and year class structure?

Another study on the Northern Peninsula is known as the Ten Mile Lake project. Initiated due to the lack of information in this area and also because the method of sampling has changed from fyke to gill net and is a standardized method of sampling used across the province. The results show that there was not a lot of difference in the catch per unit effort with the nets and what the fishers were experiencing. Also, the growth rates (length per weight) of the fish were not different from any other lake in the area. But when looked at the age the older fish were shorter than in other lakes which may suggest that the growth rate has been slowed down and may not be maximizing the resource in this area. There may not be any benefit of the management restrictions.

REPORT FROM THE BAY ST. GEORGE SALMON STEWARDSHIP GROUP

Presenter: *S. Styles, Bay St. George and Harry's River Salmon Working Groups*

Summary

A report was given from the Bay St. George Salmon Stewardship Group (BSGSSG) stating the history of salmon stocks in the area. The group states the importance of increases to retention levels which will give rise to getting anglers back on the rivers. The group believes that increasing the number of anglers on the rivers act as a strong deterrent to poaching. Through being very active in the community and including the public in all meetings the attitudes of the people in the communities of Bay St. George has changed. It is no longer acceptable to illegally net salmon. The report also discusses the 2010 season stating that all the rivers in Bay St. George had a great year and that many anglers reported high returns. The group has concerns that the 2010 return estimates from DFO are too low and wanted to know why there were not any snorkel surveys for Bay St. George Rivers. Furthermore, there is concern that the rivers in the Bay St. George area will be classified which will limit the anglers. The BSGSSG would like

to have six tags to use on the rivers and the ability to capture salmon of individual choice. The report has nine recommendations for DFO to consider for the 2011 season.

COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC) ATLANTIC SALMON UPDATE

Presenter: C. Purchase, Memorial University of Newfoundland, COSEWIC Committee

Summary

A brief update on COSEWIC and the process of making a recommendation on the status of a species. COSEWIC has, through a scientific process, looked at Atlantic Salmon in its whole geographic range in Canada and then has broken it down into Designatable Units (DU). COSEWIC then makes a scientific recommendation on how to list the species for each DU. The status recommendation for each DU are brought forward to the government who decides whether to list the species status legally under the *Species at Risk Act* (SARA).

Before the meeting ended the Science Advisory Report (SAR) was reviewed by attendees to make changes and/or additional recommendations. When all attendees were satisfied with the same conclusion the SAR was updated.

ACKNOWLEDGMENTS

Thanks are extended to all who participated at the November meeting, particularly those from outside DFO who gave up their own time to attend and contribute to the sessions. Vanessa A. Sutton-Pande kindly assisted with co-ordinating the meeting.

APPENDIX 1: TERMS OF REFERENCE

Meeting of the Newfoundland and Labrador Regional Advisory Process (RAP) on Salmonids

November 2-3, 2010

Riverhead Meeting Room, Battery Hotel and Suites, 100 Signal Hill Road
St. John's NL

Meeting Chairperson: Chuck Bourgeois, Aquatic Resources Division, DFO, NL

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 370 rivers with reported Atlantic Salmon populations characterized by differences in life history traits including freshwater residence time, age at first spawning, and the extent of ocean migrations. This year marks the fourth year of a five-year Atlantic Salmon management program. The November meeting is intended primarily to update those stocks/rivers considered during the last assessment meeting, with emphasis on determining the level of conservation spawning requirement achieved.

Objectives

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

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

The objective of this meeting will be to produce science advice for use by FAMB and other stakeholders. The meeting is not intended as a forum to seek changes/alterations to the Atlantic Salmon management Plan. The meeting will focus on the general state of salmon stocks in Newfoundland and Labrador and identify conservation issues. Harvests will also be assessed as part of the stock status assessment for Labrador. Detailed assessments of individual rivers will not be carried out. Rather, regional overviews of the status of stocks will be tabled. Finally, an update on smolt production and marine survival of Newfoundland salmon will be presented.

Products

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

¹ There are 15 Atlantic Salmon (*Salmo salar* L.) management areas know as Salmon Fishing Areas (SFAs) 1-14B in Newfoundland and Labrador. See CSAS Science Advisory Report 2009/068, Figures 1 and 2 for illustration: http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009_068_E.pdf

Invited Participants

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

APPENDIX 2: AGENDA

Atlantic Salmon 2010 Stock Status Update
 November 2-3 commencing at 09:00
 Riverhead Meeting Room, Battery Hotel and Suites
 100 Signal Hill Road
 St. John's, Newfoundland and Labrador

November 2, 2010

09:00-09:15	Introduction	C. Bourgeois
	Review of Agenda	R. Poole
	Meeting recorded	M. Robertson
09:15-09:35	CSAS Policy on Consensus	A. Mansour
09:35-10:00	Climate variability in the Northwest Atlantic Update for 2010 - Potential impacts on Atlantic Salmon	E. Colbourne
10:00-10:30	Data Review: Definition of conservation for Atlantic Salmon	B Dempson
10:30-10:45	Coffee Break	
10:45-12:00	Returns to Labrador Rivers and Harvests of salmonids in various fisheries in Labrador	D. Reddin
12:00-13:00	Lunch	
13:00-13:45	Review of biological characteristics for Bay St. George rivers	G. Veinott
13:45-14:30	Review of assessment methodology for Harry's River	G. Veinott
14:30-15:30	Returns to insular Newfoundland rivers, smolt production and marine survival trends	C. Bourgeois
15:30	Coffee Break	
16:00	Results of links between salmon populations in Newfoundland and Labrador	D. Reddin

November 3, 2010

09:00-10:00	Pre-spawning movements of Atlantic Salmon in Exploits River using radiotelemetry – preliminary results (Robertson)	M. Robertson
10:00-10:30	Application of Dual Identification Sonar (DIDSON) for salmon counting in Newfoundland and Labrador for 2010 (Reddin)	D. Reddin
10:30-11:00	Coffee Break	
11:00-11:45	Ten Mile Lake	R. Perry
11:45-12:00	Manuscripts for upgrade to Research Document and Science Advisory Report	
12:00-13:00	Lunch	
1300	Overview of the SAR and inclusion of recommendations	
	Other Business	

APPENDIX 3: ASSESSMENT TEAM AND LIST OF ATTENDEES

Assessment Team: Chuck Bourgeois, Brian Dempson, Dave Reddin, Geoff Veinott, Martha Robertson, Rebecca Poole

Attendees: List of attendees at the Salmonid stock assessment meeting, November 2010.

Name	Association	Phone	E-mail
Willcott, Rebecca	Nunatsiavut Government	709-896-8582	rebecca_willcott@nunatsiavut.com
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APPENDIX 4: SUMMARY SHEETS

STOCK: Southwest Brook (Paradise River SFA 2)

385 km²

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

Year	1998	1999	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 ²	MIN ¹	MAX ¹
Total returns to river														
Small	110	331	323	235	158	615	858	326	303	495	67	173	67	858
Large	4	43	32	34	16	54	54	35	32	35	13	17	4	54
Recreational harvest (small salmon)														
Retained	0	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	0
Recreational harvest (large salmon)														
Retained	0	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	0
Spawners														
Small	110	331	321	231	156	615	858	326	303	495	67	173	67	858
Large	4	43	32	34	16	54	54	35	32	35	13	17	4	54
Egg conservation requirement														
% met	39	139	110	82	52	201	267	110	102	157	26	57	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: Returns of small and large salmon increased over 2009 but remained below average. Conservation limits for Labrador rivers are 190 eggs per 100m² which is used to evaluate the percent of egg requirements met. In 2004-2008, egg requirements were exceeded; however, in 2009-2010 egg deposition was well under requirements for conservation.

Forecast: No forecast available.

STOCK: Sand Hill River (SFA 2)Drainage Area 1155 km²CONSERVATION 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	2010 ²	MIN ¹	MAX ¹
Total returns to river														
Small	2180	2796	3319	3141	3171	4008	7007	4967	3222	4842	1605	2225	1605	7007
Large	730	560	414	561	627	604	875	568	693	795	723	320	138	875
Recreational harvest (small salmon)														
Retained	279	289	321	155	212	109	177	123	135	95	78	103	74	321
Released	326	340	702	679	608	647	925	628	464	757	346	509	326	925
Recreational harvest (large salmon)														
Retained	29	28	20	1	7	1	5	2	1	1	3	0	0	28
Released	7	14	36	68	60	86	104	30	44	87	97	39	0	104
Other removals														
Small	0	0	0	0	15	0	0	25	6	8	4	8	0	25
Large	0	0	0	0	2	0	0	18	6	2	0	0	0	18
Spawners														
Small	1868	2473	2928	2918	2883	3834	6735	4686	3041	4671	1492	2063	1492	6735
Large	700	531	390	553	612	595	860	538	688	785	710	316	136	860
Egg conservation requirement														
% met	65	70	74	81	82	101	168	118	89	125	59	54	34	168
Smolt count									80,994	62,985	59,661	80,000	37,109	80,994
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, 2008 & 2010 and total smolt fence count for 2009.**State of the stock:** numbers of large salmon declined considerably from 2009 and were below average. Small salmon numbers are the third lowest recorded although they increased over 2009. 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 2004-2006 and 2008 but not in 2009-2010.**Forecast:** No forecast available.

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	2009	2010 ²	MIN ¹	MAX ¹
Total returns to river														
Small	59	367	224	190	108	56	337	484	498	428	280	296	56	498
Large	48	15	41	31	19	25	28	44	42	51	105	47	15	51
Recreational harvest (small salmon)														
Retained	5	8	5	1	0	2	0	6	4	4	0	0	0	8
Released	0	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	0	2
Released	0	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	0	21
Large	0	0	2	2	2	0	0	0	2	0	0	0	0	2
Spawners														
Small	54	359	209	184	87	54	337	473	491	419	280	296	54	491
Large	46	15	39	29	17	25	28	44	40	51	105	47	15	51
Egg conservation requirement														
% met	40	73	63	52	26	26	80	115	115	109	117	83	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 2008-2010 include fish counted below fence on swim-thru before removal.

State of the stock: returns of large salmon have decreased from 2009 but remain about average while small salmon increased slightly over 2009 but remained below average. Conservation limits for Labrador rivers are 190 eggs per 100 m² which is used to evaluate the percent of egg requirements met. Conservation requirements were exceeded in 2006-2009 but were somewhat below requirements in 2010.

Forecast: No forecast available.

STOCK: Exploits River (SFA 4)

Drainage area:

11602

CONSERVATION

Yea	200	200	200	200	200	200	200	2007	200	2009	2010*	MI	MAX
Total returns:													
Small	1206	1937	1558	2919	2719	2805	2492	2171	3199	3229	3913	447	3229
Larg	684	134	89	1336	94	196	336	395	457	557	727	8	557
Recreational harvest (small salmon)													
Retained	146	243	273	3633	329	387	251	245	477	353	343	57	477
Release	289	296	355	2975	249	547	489	312	456	270	415	114	567
Recreational harvest (large salmon)													
Retained	0	0	0	0	0	0	0	0	0	0	0	0	8
Release	252	28	33	19	15	51	25	48	691	316	450	0	69
Other Removals													
	4	5	5	6	1	2	3	4	2	7	0	0	11
Broodstock removal													
	0	0	0	0	0	0	0	0	0	0	0	0	511
Spawners													
	1091	1790	1331	2653	2457	2551	2522	2281	3123	3403	4251	232	3403
Fry Stocked													
	0	0	0	0	0	0	0	0	0	0	0	0	6E+06
Egg conservation requirement													
% met	2	3	2	5	4	4	4	4	6	6	8	6	6
Lower	5	9	5	14	13	8	12	15	111	172	204	2	21
Middl	1	2	2	3	3	5	4	2	6	5	6	2	6
Uppe	2	5	3	7	2	4	1	2	5	2	5	0	12
Min and max are for the period of record since 1974.													
* Preliminary													

Data and methodology: There are 35 million m2 units of fluvial habitat and 34,000 ha of lacustrine habitat. Conservation egg requirements are to come from small salmon. Previous fry releases are backcalculated to eggs for % of conservation egg deposition

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

Forecast: No quantitative forecast available

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

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

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 ²
Total returns to river											
Small	1798	2151	1974	2219	2726	3746	2768	1850	3998	3955	3790
Large	208	119	123	152	161	276	328	487	432	433	495
Recreational harvest (small salmon)											
Retained	226	148	136	170	222	145	150	197	408	369	254
Released	176	29	57	20	95	17	54	163	271	223	146
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	-	-
Released	51	9	6	0	4	4	4	45	26	33	22
Precocious post smolts	208	228	253	147	365	364	121	200	270	142	114
% 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	8.98
Spawners											
Small	1346	1772	1579	1900	2130	3235	2492	1437	3293	3419	3408
Large	203	118	122	152	161	276	328	483	429	430	493
Egg conservation requirement											
% met	152	148	138	191	212	328	273	208	360	371	381
Smolt count	35596	37170	32630	35089	32780	30123	33304	35742	40390	36722	41069
Kelt count	1597	706	1084	791	713	1329	1883	2006	930	1163	1156
% 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	9.56

¹ Min and max are for the period of record since 1993.

² Preliminary figures for 2010

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

Recreational catches: The recreational catch for 2010 were derived from 2005-2009 means.

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 rate of 10 % was used in the calculations of spawning escapements for the years 1993-09. Recreational data for 1997-09 were from the License Stub Return System. Sea s exclude previous spawners in the upstream migration. Pervious spawners were estimated in 1999 from survival patterns in previous years. The egg conservation requireme 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. Prec were excluded from the spawning population since their contributions are not fully known.

State of the stock: Returns for the last three years are above average. Conservation requirements were met for all years from 1993 to 2010.

Forecast: No forecast available.

STOCK:**Gander River (SFA 4)****Drainage Area:** 6,398 km²**CONSERVATION REQUIREMENT:** 46.211 million eggs (21,828 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	2002	2003	2004	2005	2006	2007	2008	2009 ²	2010 ²	MIN ¹	MAX ¹
Total returns to river											
Small	13444	13657	18521	17828	13959	11571	22442	18883	23184	6745	26205
Large	1898	1853	2668	2461	1927	1243	1560	869	1559	473	4815
Recreational harvest (small salmon)											
Retained	1726	1735	1325	1893	1199	489	1943	1557	1416	489	4537
Released	678	664	795	1410	554	146	1573	653	867	146	3323
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	-	-
Released	184	65	58	335	94	46	120	93	138	46	685
Spawners											
Small	11650	11787	17091	15667	12705	11067	20342	17261	21681	5565	24739
Large	1880	1911	2536	2407	1918	1238	1548	860	1545	473	4794
Egg conservation requirement											
% met	91	96	144	120	87	72	112	101	131	36	144

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 1994-2010 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 2000-2010 were estimated from relationships between counts at the Salmon Brook fishway and total returns to the counting fence for the period 1989-1999. The 2005-2009 mean angling data was used for 2010. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2010.**State of the stock:** Conservation requirement in terms of eggs, in 2010 (131%) was 30% higher than in 2009 and 30% higher than the moratorium mean. In terms of small salmon, conservation requirement was met only in 1993. Conservation egg requirement was achieved in ten of the 19 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 1992-2010 occurred in pre-moratorium years.**Forecast:** No forecast available.

STOCK: Middle Brook (SFA 5)Drainage area: 276 km²**CONSERVATION REQUIREMENT:** 2.3 million eggs (~ 1,012 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	2002	2003	2004	2005	2006	2007	2008	2009 ²	2010 ²	MIN ¹	MAX ¹
Total returns to river											
Small	916	1183	1520	1538	1173	1050	2328	1902	2574	626	2625
Large	69	74	88	62	115	141	143	85	115	13	262
Recreational harvest (small salmon)											
Retained	117	97	190	141	152	141	420	232	217	84	391
Released	28	29	24	96	75	57	276	243	149	19	458
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	-	-
Released	1	2	1	5	7	18	17	14	12	1	33
Spawners											
Small	796	1083	1328	1387	1013	903	1880	1645	2342	461	2342
Large	69	74	88	62	114	140	142	84	114	13	261
Egg conservation requirement											
% met	101	134	162	163	133	126	232	170	273	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 1994-2010 are from the License Stub Return System.**Data and methodology:** Complete counts are available from a fishway located on the lower river. The 2005-2009 mean angling data was used for 2010. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2010.**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 2010 were up 35% from 2009 and up 55% from the 92-09 mean.**Forecast:** No forecast available.

STOCK:**Terra Nova River (SFA 5)****Drainage area:** 1,883 km²**CONSERVATION REQUIREMENT:** 14.3 million eggs (~ 7,094 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha

Year	2002	2003	2004	2005	2006	2007	2008	2009 ²	2010 ²	MIN ¹	MAX ¹
Total returns to river											
Small	1435	2271	3006	2417	2546	1674	3586	2496	4147	1127	4147
Large	271	330	397	316	438	241	429	225	471	56	637
Recreational harvest (small salmon)											
Retained	146	105	134	193	127	174	148	128	154	105	645
Released	142	133	229	459	353	328	229	337	341	133	464
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	-	-
Released	7	10	7	45	209	26	17	22	64	4	209
Broodstock removal ³											
Small	0	0	0	0	0	0	0	0	0	0	352
Large	0	0	0	0	0	0	0	0	0	0	44
Spawners											
Small	1311	2179	2885	2232	2420	1514	3453	2370	4001	815	4001
Large	271	329	397	311	418	238	427	223	464	56	588
Egg conservation requirement											
% met	28	42	54	42	47	29	61	40	70	14	55

¹ Min and max are for the period of record since 1984 except recreational harvest is since 1994.² Preliminary³ 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 1994-2010 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 2005-2009 mean angling data was used for 2010. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2010**State of the stock:** The proportion of conservation requirement achieved in 2010 (70%), the highest on record, was 75% higher than in 2009, 84% higher than the moratorium mean and 60% higher than the 05-09 mean. Although this river has never achieved conservation requirement, egg depositions during the moratorium years 1992-2010 were generally higher than in pre-moratorium years. It should be noted that accessible rearing habitat for anadromous Atlantic salmon above the lower fishway more than doubled in 1985 with the opening of the area above Mollyguajeck Falls.**Forecast:** No forecast available.

STOCK:**Northwest River (SFA 5)****Drainage Area:**689 km²**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	2010	Min	Max
Total returns:													
Small	272	102	443	1,012	1207	1210	783	675	1,257	448	1,146	102	1257
Large	106	50	114	273	265	305	197	94	229	121	237	50	305
Recreational Harvest(sm salmon)													
retained	0	0	0	51	65	78	62	33	100	32	113	0	113
released	0	0	0	0	0	0	0	0	0	0	0	0	0
Recreational Harvest(lg 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
Other removals													
Small	2	0	1	2	3	13	17	19	39	11	45	0	17
Large	0	0	1	0	1	3	8	3	0	0	0	0	8
Spawners													
Small	270	102	442	959	1163	1119	704	623	1,178	424	988	102	1178
Large	106	50	113	273	264	302	189	92	229	121	237	50	302
Conservation Requirement													
% eggs met	27	11	37	81	92	93	58	50	92	37	67	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 2010 the counting fence operated from June 22 to Aug 27.

State of the stock:

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

Forecast:

No forecast available.

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	2010 ²	MIN ¹	MAX ¹
Total returns to river											
Small	65	115	70	69	76	37	97	49	78	37	158
Large	2	11	11	5	5	3	4	1	4	2	41
Recreational harvest (sm. salmon)											
Retained											
Released											
Recreational harvest (lg. salmon)											
Retained											
Released											
Spawners											
Small	65	115	70	69	75	37	97	49	78	37	158
Large	2	11	11	5	5	3	4	1	4	2	41
Egg conservation requirement											
% met	156	303	198	173	185	101	232	114	188	92	368
Smolt count											
	2076	1064	1571	1384	1385	1777	1868	1600	1012	792	2076
% Sea survival											
(Adult return year)	7.1	5.5	6.6	4.4	5.5	2.7	5.5	2.6	4.9	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 2010 (188%) is 64% higher than 2009 and no change from the moratorium mean. 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.

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	2010	MIN ¹	MAX ¹
Total returns to river												
Small	233	276	402	169	427	352	174	695	498	956	80	956
Large	60	78	73	235	95	56	35	56	34	30	1	235
Recreational harvest (small salmon)												
Retained	N/A	0	0	0	0	0	0	0	0	0	0	0
Released	N/A	5	5	0	6	0	0	0	0	0	0	5
Recreational harvest (large salmon)												
Retained	N/A	0	0	0	0	0	0	0	0	0	0	0
Released	N/A	0	0	0	2	0	0	0	0	0	0	0
Broodstock removal												
	0	0	0	0	0	0	0	0	0	0	0	76
Spawners												
Small	233	276	401	169	426	352	174	680	494	956	158	956
Large	60	78	73	235	95	56	35	56	33	30	1	89
Fry stocked												
	0	0	0	0	0	0	0	0	0	0	81983	434500
Egg conservation requirement												
% met	31	38	50	51	55	42	22	76	54	98	17	76
Smolt count												
	9392	10144	4440	13047	15847	13200	12355	18338	14041	15098	4440	18338
% Sea survival												
(Adult return year)	3	3	4	4	3	2.2	1.3	5.6	2.7	6.8	1.8	5.6

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

² Preliminary

smolt to adult survival for 2001 -2010 is smolt to small salmon

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

Data and Methodology: Fluvial habitat consists of 1.08 million m² and lacustrine habitat includes 2200 ha. Biological characteristics used in calculations are those for Rocky River stock. Previous fry releases are backcalculated to eggs for % of target

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

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

Forecast: There is no forecast for this stock.

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	2010	Min ¹	Max ¹
Total returns:	616	161	528	335	687	231	162	47	74	232	276	61	801
Small	564	125	487	322	656	216	136	39	71	231	270	55	674
Large	52	36	41	13	31	15	26	8	3	1	6	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	0	19
Small	3	0	5	0	0	0	0	1	1	3	0	0	18
Large	0	0	1	0	0	0	0	0	0	0	0	0	2
Brood stock removals:	352	0	0	0	0	0	0	0	0	0	0	0	352
Spawners	261	161	522	335	682	230	160	46	73	229	276	26	687
Small	N/A	125	482	322	652	216	135	38	70	228	270	13	656
Large	N/A	36	40	13	30	14	25	8	3	1	6	3	125
Fry Stocked	298458	288897	0	0	0	0	0	0	0	0	0	0	306180
Conservation Requirement % eggs met	263	69	224	144	293	99	69	20	31	98	118	20	295
Smolt Count	2703	4983	9963	8570	4640	1283	753	1159	4984	5467	nil	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.

STOCK: Conne River (SFA 11) 602 km²

MANAGEMENT TARGET: 7.8 million eggs (~ 4,000 small salmon) calculated as
fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha
CONSERVATION REQUIREMENT: 4.34 million eggs (~ 2,475 small salmon)

Year	2004	2005	2006	2007	2008	2009	2010 ²	MIN ¹	MAX ¹
Total returns to home waters									
Small	3818	1978	2623	1174	2823	1828	1762	1173	10155
Large	175	105	170	49	144	67	91	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	444	75	395	0	385	294	340	108	3302
Released	-	-	-	-	-	-	-	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	3366	1898	2210	1167	2411	1521	1415	1286	7823
Large	174	105	168	49	144	67	91	51	488
Management Target									
% met	97	51	61	31	65	40	39	30	219
Egg conservation requirement									
% met	174	92	110	55	117	72	69	55	394
Smolt estimate									
	79667	66196	35146	63738	68242	71085	54392	35146	100983
% Sea survival									
(Adult return year)	5.3	2.5	4.0	3.3	4.4	2.7	2.5	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 about 40% achieved in 2009 and 2010. In contrast with the Management 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 69% attained in 2010. Returns of adult salmon in 2010 decreased by 2% from 2009 and was the fourth lowest return in 25 years. Sea survival from smolts (2009) to adult small salmon returns in 2010 decreased from 2.7% (2009 returns) to 2.5% (2010 returns),

Forecast: Smolt estimates for 2010 are lower than the previous mean of about 71,000. Some smolts could have been missed at the start of the run as water temperatures approaching 9 degrees C were occurring prior to when the smolt fences were in operation. Regardless, a marine survival of about 4.6% would be required in order for the conservation requirements of 2475 small salmon to be attained in 2011. Actual forecasts of survivals and thus returns, however, are not made owing to the uncertainty associated with making predictions a year in advance.

STOCK:**Harry's River (SFA 13)****Drainage area:** 816 km²**CONSERVATION REQUIREMENT:**7.8 million eggs calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 368 eggs/ha.

Year	2002	2003	2004	2005	2006	2007	2008	2009 ²	2010 ²	MIN ¹	MAX ¹
Total returns to river											
Small	1640	2334	2828	2495	3004	1394	3614	2172	2888	888	3526
Large	285	422	498	453	680	289	414	363	417	16	676
Recreational harvest (small salmon)											
Retained	-	91	223	163	209	135	547	268	264	2	409
Released	400	237	534	485	1283	170	762	303	601	23	1411
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	0	0
Released	75	132	266	139	216	110	499	159	225	28	266
Spawners											
Small	1600	2211	2543	2279	2662	1241	2988	1873	2563	573	3198
Large	277	403	470	439	658	276	364	347	395	13	661
Egg conservation requirement											
% met	60	84	98	89	116	55	108	90	94	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 2003-2010 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 2010 were determined from a counting fence operated at Gallant's from May 28-August 12, snorkel surveys conducted below the fence site in August 2001-2008 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. A hook-and-release mortality of 10% was used in the calculation of total returns and spawning escapements for the years 1993-2010.

State of the stock: The conservation requirement attained in 2010 (94%) is 4% higher than in 2009, 3% higher than the 05-09 mean and 52% higher than the 92-09 mean..

Forecast: No forecast available.

STOCK:**Torrent River (SFA 14A)****Drainage area:** 619 km²**CONSERVATION REQUIREMENT:** 1.5 million eggs (~ 656 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 105 eggs/ha.

Year	2002	2003	2004	2005	2006	2007	2008	2009 ³	2010 ³	MIN ¹	MAX ¹
Total returns to river²											
Small	4861	3955	5110	4342	4030	2979	5886	2522	4861	96	7475
Large	432	341	549	780	1431	519	1309	1400	1285	7	1430
Recreational harvest (small salmon)											
Retained	822	588	674	455	574	384	627	337	475	137	822
Released	1299	695	854	1084	718	361	657	293	623	76	1299
Recreational harvest (large salmon)											
Retained	-	-	-	-	-	-	-	-	-	-	-
Released	111	107	128	92	115	59	159	33	92	28	224
Specimens collected below fishway:											
Small				126		20		46	1		
Large				0		13		29			
Spawners											
Small	3909	3297	4351	3653	3384	2539	5193	2110	4323	121	6923
Large	421	330	536	771	1419	500	1293	1368	1276	3	1419
Egg conservation requirement											
% met	597	496	686	675	844	458	1203	750	1063	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 minimum 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 2007-2009 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 1985-2010.

State of the stock: The total returns of small salmon to Torrent River in 2010 were 93% higher than in 2009. 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 2010, and was 42% higher than 2009 and 49% above the moratorium mean.

Forecast: No forecast available.

STOCK:**Western Arm Brook (SFA 14A)****Drainage area:** 149 km²**CONSERVATION REQUIREMENT:**0.91 million eggs (~ 292 small salmon) calculated as fluvial area x 2.4 eggs/m² and lacustrine area x 105 eggs/ha.

Year	2002	2003	2004	2005	2006	2007	2008 ³	2009 ³	2010 ³	MIN ¹	MAX ¹
Total returns to river											
Small	1465	1406	1151	1019	1300	793	1920	1063	1782	233	1920
Large	48	23	74	43	44	17	15	21	47	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	7	0	346
Large	0	2	1	1	1	0	0	0	0	0	3
Spawners											
Small	1463	1386	1149	989	1278	779	1907	1037	1775	117	1907
Large	48	21	73	42	43	17	15	21	47	0	128
Egg conservation requirement											
% met	510	466	425	355	446	258	611	341	598	30	625
Smolt count											
	14999	12086	17323	8607	20826	16621	17444	18492	19044	6232	23845
% Sea survival ²											
(Adult return year)	9.1	9.4	9.5	5.9	15.1	3.8	11.6	6.1	9.6	2.2	15.1
¹ Min and max are for the period of record since 1974.											
² Sea survival is from smolt to returns as small salmon.											
³ Preliminary											
Note: Any changes from previous reports are due to the updating of preliminary data and biological characteristics information.											

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

Data and methodology: Counts of smolts and adult salmon were obtained at a fish counting fence located at the mouth of the river in 1971-2010. 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 2010 was 75% higher than in 2009 and 58% higher than the 92-09 mean. Smolt production in 2010 was 3% higher than in 2009 but 20% lower than the maximum production value (23845) achieved in 1997. The 2010 sea survival was up 58% from 2009 and 23% from the 92-09 mean.

Forecast: No forecast available.