Fisheries and Oceans Pêches et Océans

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Évaluation des stocks canadiens Séries des comptes rendus 99/33

Assessments of Atlantic salmon stocks of the Maritimes Region, 1998

Proceedings of the Diadromous Subcommittee
Regional Advisory Process

Peer Review Teleconference
Maritime Center
Halifax, N.S.

January 22, 1999

Chairperson:
John Ritter

Department of Fisheries and Oceans
Science Branch, Maritime Region
Gulf Fisheries Centre
343 Archibald Street
Moncton, N.B.
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Canada

November 1999

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TABLE OF CONTENTS

Abstract

In response to client demands to advance the announcement of management plans for Atlantic salmon, early assessments on all the Maritime salmon stocks were conducted in January 1999, rather than in March as in previous years. Individual stock assessments were summarized in a single co-authored working paper reviewed by a 20-member panel comprised of representatives from DFO Science and Fisheries Management, local provincial government agencies and industry. The review was conducted by teleconference on January 22 and 25, 1999. Products from the review include one research document, a Stock Status Report highlighting status of Maritime Atlantic salmon stocks and this Proceedings document.

Resumé

Les clients ayant demandé d'avancer la parution des plans de gestion du saumon de l'Atlantique, les évaluations de tous les stocks de saumon des Maritimes de 1999 ont été effectuées en janvier, plutôt qu'en mars comme cela était le cas les années précédentes. Les évaluations de chaque stock ont été résumées et présentées dans un document unique établi par tous les auteurs et examiné par un comité de 20 membres composé de représentants des Sciences et de la Gestion des pêches du MPO, des organismes des gouvernements provinciaux concernés et de l'industrie. Cet examen a eu lieu par téléconférence les 22 et 25 janvier 1999. Un document de recherche, un Rapport sur l'état des stocks décrivant l'état des stocks de saumon de l'Atlantique dans les Maritimes et le présent compte rendu sont issus de cet examen.

Introduction

In response to client demands to advance the announcement of management plans for Atlantic salmon, early assessments on all the Maritime salmon stocks were conducted in January 1999. Where potentially critical to management considerations, new and more refined analyses were reviewed in March 1999 and advice updated accordingly.

The peer review was carried out by teleconference, which commenced at 13:00 hrs on Friday, January 22, 1999 and extended through the afternoon. The panel members were reconvened at 9:00 hrs on Monday, January 25, 1999, to complete their review of the resulting Stock Status Report.

The assessment of all Maritime salmon stocks was detailed in a single working paper co-authored by the assessment biologists responsible for the individual stock assessments. The working paper was distributed to review panel members in advance of the formal review. Referee assignments were made by Salmon Fishing Area and also one individual was asked to provide overview comments on the assessment. Rapporteurs were assigned to capture comments, concerns and the author's responses and their reports follow.

The review committee was comprised of 20 individuals from DFO Science (Maritimes, Newfoundland and Headquarters), DFO Fisheries Management, the provincial governments of NB and NS, and industry (Atlantic Salmon Federation, Miramichi Watershed Management Committee). The review was chaired by John Ritter.

The remit for the meeting was:

1. What is the status of Maritime Atlantic salmon stocks for each Salmon Fishing Area (SFA).
2. What is the outlook for Maritime Atlantic salmon stocks in 1999, and beyond?
3. What are the management considerations for 1999 for the various Maritime Atlantic salmon stocks?

OVERVIEW

Working Paper(s): Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998 DFO Maritimes RAP Working Paper 99/53

Referee(s): Paul Fanning

Rapporteur: Shane O'Neil

Issues/Concerns: (Including response)

Paul Fanning provided overview comments. His major points were as follows:

1. Risk analysis scenarios in groundfish assessments are usually based on a curve, which relates risk to harvest levels. Perhaps a similar relationship could be developed for the salmon removals. *Response: For salmon, there is a fixed conservation requirement and removals are not harvest-fishery-target based. Also, total harvest for the collection of stocks is not regulated.*

2. Concerned that the criteria 1 and 2 (page 6 in document) as listed do not reflect whether escapements are OK relative to the requirements but only relative to recent trend information. Criteria 3 and 4 seem OK in that regard. P. Amiro commented that it would be useful if these criteria could be defined with a quantitative set of measures for evaluation against. Chair commented that some review of the criteria was necessary and perhaps could be brought forward at a subsequent RAP meeting for peer review.

3. Remit: Information available in the Working Paper seemed insufficient to support the conclusions, at least upon first review.

- Less than one-half of the SFA's used measures to qualify the estimate. The statistics provided were often limited and not always clear.

- However, having heard the discussions today, the conclusions and recommendations seem consistent with what was presented but the process has been rushed and time was insufficient to thoroughly review some of the issues or approaches.

Overview comments by others:

1. Table 3: Status column gets dropped;

2. Probability in tables and text: Indicate clearly that the probability is based on the 5-year mean.

CHALEUR BAY, NORTHERN NEW BRUNSWICK (SFA 15)

Working Paper(s): Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998 DFO Maritimes RAP Working Paper 99/53

Referee(s): François Caron and Fred Whoriskey

Rapporteur: David Cairns

Summary/Abstract:

Large salmon returning to the **Restigouche River** in 1998 fell short of the conservation requirement but returns in 1999 may meet the requirement (50% chance). Losses of large salmon of the Restigouche River to fishing in 1999 will reduce the probability of meeting the conservation requirement to below 50%. Large salmon returns may be sufficient to meet the conservation requirement on the **Jacquet River**, but again are expected to be insufficient on the **Nepisiquit River**.

Issues/Concerns: (Including response)

1. Lack of Listiguij data should be given more prominence in text. *Response: Listiguij exploitation considered in the same way as marine mortality incl. high seas fishing.*
2. Could in-season analysis assist in producing an appropriate management regime? – *Response: There are few options (other than the Upsalquitch fence) that could be the basis of in-season analysis.*

MIRAMICHI AND SOUTHEAST NEW BRUNSWICK (SFA 16)

Working Paper: Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998 DFO Maritimes RAP Working Paper 99/53

Referee(s): Dave Meerburg and Rod Bradford

Rapporteur: Peter Amiro

Summary/Abstract:

The **Miramichi River** failed to meet its conservation requirements in 1998 for the second year in a row. The outlook for 1999 is for a modest increase in returns of large salmon from 1998, but uncertainty exists as to whether the improved return will be sufficient to meet

conservation requirements. The **Tabusintac River** exceeded its conservation requirement again in 1998 and is expected to repeat in 1999. The **Bouctouche River** achieved only a third of its conservation requirement in 1998, thereby failing to meet the requirement for the sixth consecutive year.

Issues/Concerns: (*Including response*)

1. Status had to be based on returns and not escapement because catches were not available. *Response: Catches will not be available in 1998.*
2. Show error of mark and recapture population estimate. *Response: 15%CV.*
3. Noting that 1998 returns are up 46% for 1997 does not reflect the low abundance in 1997.
4. Northwest trapnet data does not show fall run.
5. Five year average as a forecast model is new, undocumented and does not allow for a significant decline over the period. *Response: Over the past five years, no decline in returns is evident in the Miramichi. (Rebuttal that the first observation of three consecutive years of lower small recruits was in 1996 to 1998).*
6. Should show proportion hatchery by run-timing and by branch. *Response: Difficult if not impossible to do; one problem lies in definition of the early vs. the late run.*
7. Juvenile abundance was up in 1998 relative to time series yet escapements have been estimated to have declined. *Response: The uncertainty of electrofishing efficiency, water level, fish movement and annual survival rates are more than sufficient to explain this discrepancy.*
8. Independent estimates of returns by branch are down yet the overall estimate for the Miramichi shows no decline in returns. *Response: There are different time periods for each analysis.*
9. Portions of repeat spawning salmon not shown therefore the number of 2SW is unknown. *Response: The portion of repeat spawning salmon has increased in recent years*.

Consensus:

- Did not meet conservation requirement in 1998.
- Juvenile densities are up in 1998.
- Forecast is uncertain for 1999.
- An in-season assessment is required for any management plan that exploits eggs.

<u>Research Recommendation</u>

1. Develop and test forecast models.
2. Develop aging analysis for MSW salmon and incorporate into assessment.
3. In-season forecast methods need to be explored, reviewed and employed for 1999.
4. The appropriateness of the 2.4 egg m^{-2} deposition rate needs review for the Miramichi River.

Other

- Returns of grilse were up in 1998 therefore the outlook for 1999 is positive. (M. Hambrook)

Minority Opinion:

- Returns were early, higher at barriers, juveniles increased, and mark/recapture may have missed the late run therefore the status is good for 1998 and no need for alarm for 1999. (P. Cronin). Conversely, the decline in returns of grilse in the past three years and the unknown age composition of large salmon undermines the forecast and indicates a not so optimistic forecast for 1999 is just as likely. (P. Amiro, D. Meerburg)

PRINCE EDWARD ISLAND (SFA 17)

Working Paper: Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53

Referee(s): Dave Meerburg and Rod Bradford

Rapporteur: Peter Amiro

Summary/Abstract:

Since the mid-1980s, the majority of salmon returning to the **Morell** (95% in 1998), and other PEI rivers, have been of hatchery origin. Because of the high proportion of hatchery fish in returns, runs are largely dependent of egg deposition in the rivers. Removals of small salmon by aboriginal and recreational fishermen, and hook-and-release fisheries on small and large salmon, have little impact on future runs provided the stocking levels of recent years remain unchanged.

Issues/Concerns: (*Including response*)

1. Needs estimate of the probability of attaining the broodstock requirements.
2. No harvest data presented for 1998.
3. Show distribution of forecasts.
4. There are inconsistencies between the juvenile and adult data. Questions whether the sampling design was robust enough to make this comparison possible.
5. Assumption that "split-season" reduced fishing mortality was not supported.

Consensus:

1. Did not meet conservation requirement in 1998.
2. Need to obtain broodstock before exploitation in 1999.
3. Should exploit only hatchery produced salmon in 1999.

<u>Research Recommendation</u>

1. Examine which are the most appropriate watch points, i.e. fry, parr, adults, for input to

salmon management in SFA 17.
2. Develop exploitation model for the recreational fishery.

NORTHUMBERLAND STRAIT NOVA SCOTIA (PART OF SFA 18)

Working Paper(s): Marshall et al. 1999. Assessments of Atlantic Salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53

Referee(s): Ross Claytor
Conrad Mullins

Rapporteur: Gérald Chaput

Issues/Concerns: (Including response)

1. Reference to Elson's norms: Concern expressed that Elson's norms were developed for rivers in New Brunswick (Miramichi and Saint John) which at the time may have been underseeded relative to the current conservation requirements. Should revisit the norms to determine if they are appropriate indices of status for Northumberland Strait rivers.
2. For River Philip: Should review the effect of past stocking and water conditions to explain the presence of early-run salmon in River Philip.
3. Were there changes in the 1998 management plan that would have affected the exploitation rate values assumed from previous years? *Response: No change in management plan in 1998 from previous years.*

Consensus:

Research Recommendation

1. Spawning requirements for River John and Wallace River should be revisited.
2. Biological characteristics for West River (Antigonish) are still missing. Characteristics borrowed from South River in the 1980's may not be appropriate

CAPE BRETON (SFA 19 AND PART OF SFA 18)

Working Paper(s): Marshall et al. 1999. Assessments of Atlantic Salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53

Referee(s): Ross Claytor
Conrad Mullins

Rapporteur: Gérald Chaput

Issues/Concerns: (Including response)

1. There are inconsistencies mentioned between past escapement as inferred from juvenile abundance and the corresponding estimates of escapement. This issue should be resolved by ensuring that the juvenile abundance indices are representative of the river.
2. In 1998, split season/reduced season was used with the intention to reduce the hook and release mortality. How was the lower value for the season used in the assessment derived? Was the plan effective? *Response: No data available to determine if split season had an impact in reducing hook and release mortality.*
3. Need more details of Stock and Recruitment relationships for Margaree and North River.
4. Other rivers: Information presented (electrofishing data) is insufficient to support the conclusions, especially in light of concerns regarding the inconsistencies in juvenile abundance and estimates of escapement in other rivers.
5. In the outlook presentation, table 3 should be simplified by presenting risk to meeting conservations relative to total harvests. Similarly, the probability plot of the outlook should be provided.

Consensus:

Research Recommendation

1. Resolve the contradictions between juvenile abundance indices to infer spawning escapement in previous years and corresponding estimates of adult escapement.

ATLANTIC COAST NOVA SCOTIA (SFA 20 and 21)

Working Paper: Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53

Referee(s): Al. McNeill and Fred Whoriskey

Rapporteur: Larry Marshall

Summary/Abstract:

Salmon stocks of the St. Mary's and LaHave low-acid impacted rivers were again assessed in 1998. Neither attained conservation requirements and the probability of attaining requirements in 1999 is 25% for the St. Mary's and 75% for the LaHave above Morgans Falls. The LaHave River without hatchery supplementation, however, has only a 10% chance of attaining requirements. Partially-acidified rivers include the Liscomb where there is an almost total loss of wild salmon and severe decline in the survival of stocked hatchery salmon. Conservation requirements for partially-acidified rivers are not expected to be met in 1999. Rivers such as the East River, Sheet Harbour, Mersey, Clyde and Jordan are "acid-impacted", no longer support the production of salmon and do not have operational conservation requirements. Adult returns to acid–impacted rivers are totally reliant on stocking and all fish in excess of broodstock are for exploitation.

Issues/Concerns: (*Including response*)

1. Adult return data provided for the St. Mary's River is inadequate to fully appreciate that a doubling to 2,000 fish in 1999 is probably not statistically different from the estimated 1,000 returns in 1997.
2. Details of St. Mary's mark-and-recapture population estimate are inadequate to allay concerns re: potential biases in procedures and incomplete "recovery" runs on the East and West Branches. *Response: Bias in methodology is reduced by not placing marks in lower-most reaches, not marking during high water temperatures and by allowing one or more days between initial marking and subsequent recovery operations.*
3. Concern expressed about the future of the LaHave River stock without hatchery supplementation.
4. Concern expressed that LaHave River stock being used as a donor stock to support fisheries in rivers that can no longer sustain natural production.
5. What might be contributing to "residual" delayed mortality of stocked smolts? *Response: Norwegian work suggests that the effect of low pH may result in death up to 10-days after initial exposure.*

Other:
For consultation at March meeting.

1. Table new data on egg-to-smolt recruitment for LaHave River above Morgans Falls.
2. Table G. Lacroix's pH "cruise" data as they relate to possible delayed release mortality of hatchery smolts.
3. Work towards the establishment of rational conservation requirements for low-acid, partially-acidified and acid-impacted rivers of SFAs 20 and 21.

INNER BAY OF FUNDY (SFA 22 AND PART OF SFA 23)

Working Paper: Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998 DFO Maritimes RAP Working Paper 99/53

Referee(s): Ross Claytor and Peter Cronin

Rapporteur: Kimberly Robichaud-LeBlanc

Summary/Abstract:

The Inner Bay of Fundy salmon stocks (e.g. Stewiacke, Big Salmon) are critically low. Surveys of juveniles and for adults, conducted in 1998, indicate that there are few Atlantic salmon of any age remaining in these 30-some rivers. In spite of hatchery stocking, conservation requirements were not achieved in the Gaspereau River (an Outer Bay of Fundy stock in SFA 22) in 1998 and are not expected to be met in 1999.

Issues/Concerns: (Including response)

1. Historical data on returns to Big Salmon River and Gaspereau River would help put things into perspective. Can a chart of historical returns be constructed for these rivers?
2. Is the issue of forest spray a factor in the decline of stocks? Fundy National Park is not sprayed, but other areas are sprayed? *Response: 4NP has a short degeneration time (24hrs), is applied in mid May when most smolts are gone and was not widely applied to any inner Bay of Fundy rivers during the period of the decline.*
3. Point Wolf River data missing.
4. Big Salmon River electrofishing data needs to be included.
5. Need to indicate how many rivers are included in inner Bay of Fundy.

OUTER BAY OF FUNDY (PART OF SFA 23)

Working Paper: Marshall et al. 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998 DFO Maritimes RAP Working Paper 99/53

Referee(s): Ross Claytor and Peter Cronin

Rapporteur: Kimberly Robichaud-LeBlanc

Summary/Abstract:

Assessed stocks in this area include those of the Saint John at Mactaquac and those of the Nashwaak, Magaguadavic and St. Croix rivers. Generally these stocks have not been meeting conservation requirements during the last decade and in 1998 were closed to all directed fisheries. There was a near-zero probability that conservation requirements were attained by these stocks in 1998 and a near-zero probability that returns to these rivers in 1999 would approach conservation requirements.

Issues/Concerns: (Including response)

1. Concerns about where the juvenile data fits into the picture, i.e. are data representative, do they correlate with escapement? If not, what is its utility?
2. Nashwaak River: Interpretation of statement regarding predators and disease needs to be put in context of lesser "constraints".
3. Statement regarding juvenile salmon kept in Tay River hatchery needs to be explained (Why? How long? Unless it is an aquaculture facility?)
4. Kennebecasis River: Needs comment on status relative to previous years.
5. St. Croix River: Confusion exists with term "farmed fish escapees".
6. Add number and percentage of eggs removed at Mactaquac Hatchery for production purposes (1.7 million).
7. Concerns about washouts, mortality and actions taken. Where fish getting through the fence uncounted and unmarked? Response: Fence is used as platform for marking for late-season mark-and-recapture experiments.
8. Would like to see levels of confidence around the smolt production estimate for the Nashwaak included in March document.
9. Brown trout thought only to be in the Meduxnekeag.

Other

For consultation at March meeting.

1. Elaborate on Nashwaak adult return estimate, i.e., marks available with recapture effort and numbers.
2. Investigate utility of juvenile densities with respect to estimates of escapement.
3. Evaluate the status and any trends for wild salmon above Mactaquac.

4. Follow-up on the potential for discriminant analyses of scale characteristics to identify hatchery and wild composition at Mactaquac, conducted by Stokesbury.
5. Review findings of smolt and post-smolt downstream passage experiments conducted by Whoriskey/Carr.

List of Participants

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Invitation Letter

Fisheries and Oceans / Pêches et Océans

Science Branch
Maritimes Region
1505 Barrington Street
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Date

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»,
«Address2»
«City», «State»,«PostalCode»

The meeting will be arranged and chaired by J. Ritter. Calls will be placed by the conference operator prior to 13:00 hrs and the meeting will commence as soon as connections are established.

Please note your assigned Salmon Fishing Area to provide lead comment or act as rapporteur. Reviewer comments should be substantive in nature and provided by written, on document, or electronic form to the senior author for distribution. Rapporteurs are asked to use the attached form to record comments of the meeting.

We have been asked to address three issues:

1. What is the status of Maritime Atlantic salmon stocks for each Salmon Fishing Area?
2. What is the outlook for Maritime Atlantic salmon stocks for 1999, and beyond?
3. What are the management considerations for 1999 for the various Maritime Atlantic salmon stocks?

Please review the document and provide comment on:

1. Are the interpretations and conclusions drawn in the document supported by the information available?
2. For the Overview, is the accuracy and precision of the interpretations consistent among Salmon Fishing Areas?

Please provide all rapporteur comment to J. Ritter by electronic mail (ritterj@mar.dfo-mpo.gc.ca) and reviewers comment to L Marshall by e-mail (marshalll@mar.dfo-mpo.gc.ca) or by mail:
Diadromous Fish Division
PO Box 550
Halifax, N.S.
B3J 2S7

Peter Amiro

Meeting Schedule (Agenda) by Teleconference

Date: January 22 & 25, 1999

Starting Time: 1300 hrs

Venue:

- Participants connected by teleconference initiated from 18S (Witcher Board Room) Maritimes Centre, 1505 Barrington Street, Halifax, Nova Scotia. Participants connected to conference through links to:
  - Gulf Fisheries Centre, Moncton, New Brunswick
  - Fredericton, New Brunswick
  - Pictou, Nova Scotia
  - Corner Brook, Newfoundland
  - Ottawa, Ontario
  - Quebec City, Quebec

- Stock assessments for all Maritime salmon stocks presented in a single Working Paper, co-authored by Assessment Biologists responsible for the stocks within the different Salmon Fishing Areas (SFA). The Working Paper was distributed to Referees and other Review Panel members in advance of the formal review.

- Assessments will reviewed by SFA with the author giving a very brief synopsis (5 minutes), followed by the referees providing their main comments (10 minutes each), and 5 minutes generally assigned to wrap-up of the Management Considerations and Research Recommendations (if any). Some sessions will be shorter because of reduced complexity of the assessment.

- A single Stock Status report will be produced for all Maritime Salmon stocks. The Summary and Management Considerations sections of the Stock Status Report will be reviewed in detail by the Review Panel, along with any other controversial issues to be presented in the Stock Status Report.

- The different sections of the Stock Status Report will be reviewed by at least one other reviewer plus the editor.

A G E N D A

Time Assigned	Item / Section of Paper	Author / Presenter	Rapporteurs	Referees
Friday, January 22nd				
13:00 - 13:15	Introductory Remarks	John Ritter		
13:15 – 13:45	Overview	Gerald Chaput Larry Marshall	Shane O'Neil	Paul Fanning
13:45 – 14:05	SFA 15 (Chaleur Bay, Northern New Brunswick)	Gerald Chaput	David Cairns	Francois Caron Fred Whoriskey
14:05 – 14:35	SFA 16 (Miramichi and Southeast New Brunswick)	Gerald Chaput	Peter Amiro	Dave Meerburg Rod Bradford
14:35 – 14:50	SFA 17 (Prince Edward Island)	David Cairns	Peter Amiro	Dave Meerburg Rod Bradford
14:50 – 15:10	Part of SFA 18 (Northumberland Strait Nova Scotia)	Shane O'Neil	Gérald Chaput	Ross Claytor Conrad Mullins
15:10 –15:30	BREAK			
15:30 – 16:00	SFA 19 and Part of SFA 18 (Cape Breton)	Larry Marshall	Gérald Chaput	Ross Claytor Conrad Mullins
16:00 – 16:30	SFA 20 & 21 (Atlantic Coast Nova Scotia)	Peter Amiro	Larry Marshall	Al McNeill Fred Whoriskey
16:30 – 17:00	SFA 22 & and Part of SFA23 (Inner Bay of Fundy)	Peter Amiro	Kim Robichaud-LeBlanc	Ross Claytor Peter Cronin
17:00 – 17:30	Western part of SFA 23 (Outer Bay of Fundy)	Larry Marshall	Kim Robichaud-LeBlanc	Ross Claytor Peter Cronin
Monday, January 25th				
9:00 – 11:00	Review Stock Status Report – Summary and Management Considerations	John Ritter		

Workshop Terms of Reference
Sponsored by the Diadromous Subcommittee of
the Regional Assessment Process (RAP)

To: Reviewers and Rapporteurs
Attachments: Assessment of Atlantic Salmon stocks of the Maritimes Region, 1998; Rapp. Rpt
Action: Peer Review Teleconference
Date: Friday, January 22, 1999
Time: 13:00 hrs

Participant	Location	Reviewer Assigned	Rapporteur/ Assignment	Phone Number
J.A. Ritter	Hfx.(Whitcher Rm)		Overview	(902) 426-9079
T.L. Marshall	Hfx.		20&21	
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K. Robichaud-LeBlanc	Hfx.		22&23	
S. O'Neil	Hfx.		Overview	
P. Amiro	Hfx.		16&17	
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F. Caron	Que.	15		(418) 521-5442
A. McNeill	Pictou	20 & 21		(902) 485-7024
R. Claytor	Mon.	18 & 19,22 & 23		(506) 851-2945
F. Whoriskey	Chamcook	15, 20 & 21		(506) 529-1039
Paul Fanning		Overview		

The meeting will be arranged and chaired by J. Ritter. Calls will be placed by the conference operator prior to 13:00 hrs and the meeting will commence as soon as connections are established.

Please note your assigned Salmon Fishing Area to provide lead comment or act as rapporteur. Reviewer comments should be substantive in nature and provided by written, on document, or electronic form to the senior author for distribution. Rapporteurs are asked to use the attached form to record comments of the meeting.

We have been asked to address three issues:

1. What is the status of Maritime Atlantic salmon stocks for each Salmon Fishing Area?
2. What is the outlook for Maritime Atlantic salmon stocks for 1999, and beyond?
3. What are the management considerations for 1999 for the various Maritime Atlantic salmon stocks?

Please review the document and provide comment on:

1. Are the interpretations and conclusions drawn in the document supported by the information available?
2. For the Overview, is the accuracy and precision of the interpretations consistent among Salmon Fishing Areas?

Please provide all rapporteur comment to J. Ritter by electronic mail (ritterj@mar.dfo-mpo.gc.ca) and reviewers comment to L Marshall by e-mail (marshalll@mar.dfo-mpo.gc.ca) or by mail:
Diadromous Fish Division
PO Box 550
Halifax, N.S.
B3J 2S7

PAPERS

Assignment Numbers	Paper Titles	Authors	Rapporteurs	Referees
Overview	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	O'Neil, Shane	Fanning, Paul
SFA 15 (Chaleur Bay, Northern New Brunswick)	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Cairns, David	Caron, François and Whoriskey, Fred
SFA 16 & 17 Miramichi and southeast New Brunswick (SFA 16) and PEI (SFA 17)	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Amiro, Peter	Meerburg, Dave and Bradford, Rodney
SFA 18 Northumberland Strait Nova Scotia (Part of SFA 18)	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Chaput, Gérald	Claytor, Ross and Mullins, Conrad
SFA 19 and Part of SFA 18 Cape Breton	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Chaput, Gérald	Claytor, Ross and Mullins, Conrad
SFA 20 & 21 (Atlantic Coast Nova Scotia)	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Marshall, Larry	McNeill, Al and Whoriskey, Fred
SFA 22 & and Part of SFA23 Inner Bay of Fundy	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Robichaud-LeBlanc, Kim	Claytor, Ross and Cronin, Peter
Western part of SFA 23 (Outer Bay of Fundy)	Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. DFO Maritimes RAP Working Paper 99/53	Marshall et al. 1999	Robichaud-LeBlanc, Kim	Claytor, Ross and Cronin, Peter

RESEARCH RECOMMENDATIONS:

Taken from Rapporteur Reports:

In Miramichi and Southern New Brunswick (SFA 16)

1. Develop and test forecast models.
2. Develop aging analysis for MSW salmon and incorporate into assessment.
3. In-season forecast methods need to be explored, reviewed and employed for 1999.
4. The appropriateness of the 2.4 egg m^{-2} deposition rate needs review for the Miramichi River.

In Prince Edward Island (SFA 17)

1. Examine which are the most appropriate watch points, i.e. fry, parr, adults, for input to salmon management in SFA 17.
2. Develop exploitation model for the recreational fishery.

In Northumberland Strait Nova Scotia (Part of SFA 18)

1. Spawning requirements for River John and Wallace River should be revisited.
2. Biological characteristics for West River (Antigonish) are still missing. Characteristics borrowed from South River in the 1980's may not be appropriate

In Cape Breton (SFA 19 and Part of SFA 18)

1. Resolve the contradictions between juvenile abundance indices to infer spawning escapement in previous years and corresponding estimates of adult escapement.

MANAGEMENT CONSIDERATIONS

Taken from Papers:

In Chaleur Bay (SFA 15)

1. The Restigouche River (in New Brunswick) fell short of the conservation requirement in 1998 but returns in 1999 may meet the requirement. Similarly, requirements may be met on the Jacquet River but are not expected to be achieved on the Nepisiquit River. Small salmon in these rivers are predominantly male and their current harvest generally is not limiting stock conservation.

In Miramichi and Southern New Brunswick (SFA 16)

1. The Miramichi River failed to meet the conservation requirements in 1998 for the second year in a row. The outlook for 1999 is for a modest increase in returns of large salmon over 1998, but uncertainty exists as to whether the improved returns will be sufficient to meet conservation requirements. The early-run small salmon have a high female proportion (>25%) and their harvest in 1999 would have a greater impact on conservation than the harvest of fall-run small salmon. The Tabusintac River exceeded the conservation requirement again in 1998 and is expected to repeat in 1999, whereas the Buctouche River, an index river for New Brunswick Northumberland Strait rivers, achieved only a third of the conservation requirement in 1998, thereby failing to meet the requirement for the sixth consecutive year.

In Prince Edward Island (SFA 17)

1. In SFA 17, the majority of salmon returning to the Morell (95% in 1998) and other PEI rivers **(SFA 17)**, since the mid-1980s, have been of hatchery origin. Because of this, the current fisheries are having little impact on future runs, although the selective harvest of hatchery salmon (those with a missing adipose fin) would enhance protection of the few returning wild salmon.

In Northumberland Strait Nova Scotia (Part of SFA 18)

1. In Northumberland Strait, mainland Nova Scotia rivers **(part of SFA 18)**, conservation requirements continue to be exceeded and are expected to be met in almost all rivers in 1999.

In Cape Breton (SFA 19 and Part of SFA 18)

1. Conservation requirements continue to be exceeded in the Margaree and probably other west coast Cape Breton rivers. Continued exploitation at current levels should not be a conservation concern. In contrast, North River appears to be the only assessed river in SFA 19 (eastern Cape Breton) that met the conservation requirement in 1998 and the only assessed river expected to achieve its requirement in 1999.

On the Atlantic Coast Nova Scotia (SFA 20 and 21)

1 Salmon returns to rivers along the Atlantic Coast of mainland Nova Scotia **(SFAs 20 and 21)** were insufficient to meet conservation requirements in 1998. Egg depositions in these rivers are contributed equally by small and large salmon. Wild returns in 1999 are not expected to be sufficient to meet requirements for any of the rivers. Returns in 1999 may be above conservation requirements in some rivers supplemented by hatchery stocking. The acid impacted rivers dependent on stocking, which include the East River Sheet Harbour, Mersey, Clyde and Jordan rivers, are expected again to yield returns available for harvest, considering these rivers have no conservation requirements

In Inner Bay of Fundy (SFA 22 and Part of SFA 23)

1. Salmon stocks are critically low, should not be harvested, and require immediate action to prevent their extirpation.

In Outer Bay of Fundy (Western Part of SFA 23)

1. Stocks did not meet conservation requirements in 1998 and probabilities of achieving requirements in 1999 are virtually zero. Egg depositions for the Saint John River stock upriver of Mactaquac reached a low in 1998 of 16% of the conservation requirement. Wild salmon returns were the lowest since the completion of Mactaquac Dam in 1968. The Nashwaak River stock is assumed to be representative of stocks of the Saint John River downstream of Mactaquac and achieved only 31% of its requirement. Stocks of other outer Bay of Fundy rivers (e.g., Magaguadavic River) have declined dramatically in the last decade and action is required to prevent their extirpation.

1. SPECIES / STOCK:
- Prince Edward Island salmon and trout (SFA 17)

2. ARRANGEMENTS: PEI Area Office. Meeting chair: Hank Scarth
DATE: 17 December 1998
TIME: 18:45 to 21:40
LOCATION: Rodd's Travelodge Inn, Charlottetown

3. FORM OF CONSULTATION
- Science and management consultation

4. PARTICIPANTS
Hank Scarth (chair)
Jim Jenkins
David Cairns (recording secretary)
Leaming Murphy
Art Smith
Bruce Smith
Rosie MacFarlane
Daryl Guignion
Darren Riggs
Dave Biggar
James D. Gallant
Joe MacDonald
Arthur Peters
Kevin MacAdam
Kevin Kelly

5. NEW INFORMATION BROUGHT FORWARD
- None

6. CONCERNS RAISED BY CLIENTS
- Leaming Murphy reported that draft guidelines for impoundment management were completed in April 1998. Under these guidelines, decisions on impoundment management are to consider impoundment quality as it relates to salmonid requirements, the value of wildlife habitat in wetlands associated with the impoundment, and the attitude of local communities. Indices are available to measure the first and second of these criteria, and a system to measure the third parameter is under development. Some members expressed concern that progress toward impoundment management that recognizes fish needs is very slow.
- Treble hooks have come into use in the Trout River (Coleman) area. Clients felt they should be banned. It was decided to determine if this is a widespread issue on PEI and the Maritimes. In the meantime their use could be suppressed in the Trout River through the

river-specific management scheme for that system.

- Concerns were raised that salmonid angling mortality at Cranes on the Morell River is excessive, due to crowding of fish there because groundwater seeps provide cool water during warm periods. It was decided that angling be banned in this area in summer 1999 on a trial basis.
- Water quality problems (high temperatures, gas supersaturation) in Leards Pond, Trout River, are causing problems for salmonids in the pond and in the area downstream. Part of the problem is beaver stoppages in the inflowing waters. DFO Habitat Management and provincial Fish and Wildlife will collaborate in addressing this problem.
- Concern was raised about salmonid by-catch in eel fyke nets in the St. Peters River. DFO will look into whether the requirement to space eel nets 200 m apart is being observed in this area.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- None

b.) Pertaining to next year's workplans

- The anticipated draw-down of MacAusland's Pond gives rise to an opportunity to investigate changes in fish fauna in a river whose fish passage to the sea will be opened after 18 years of blockage. It was recommended that an Honours or graduate project be set up to take advantage of this. This project would require supervisory input from DFO.

Other Concerns:

- None

David Cairns
NAME OF PRESENTER

David Cairns
NAME OF RAPPORTEUR

1. SPECIES / STOCK:

- **Atlantic Salmon – Cape Breton (SFA 19 and Part of SFA 18)SFA 18)**

2. ARRANGEMENTS:

DATE: Dec. 15, 1998
TIME: 7:00 PM
LOCATION: Bell Museum, Baddeck, NS.

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC.)

- Science Information Exchange
- Cape Breton Sport Fishery Advisory Committee
- Zone Management Advisory Committee 18 (Gulf Cape Breton) and 19 (Eastern Cape Breton)

4. PARTICIPANTS (Name and Affiliation)

Marshall Kaiser, (Chair, CBSFAC),
David Harding (C.B. Anglers),
Lewis Hinks (Atlantic Salmon Federation),
John Hart and Leonard Forsyth Doug Shaw (Margaree Salmon Assoc.),
Gordon Delaney and Sandy McLain (C.B. Highlands National Park),
John Macdonald, Douglas Poole and Tom Eavis (North Sydney Wildlife Assoc.),
Hubert Doyle and John Boudreau (Richmond Wildlife),
David Baille and Vernon Boone (Port Morien Wildlife),
Jason LeBlanc (N.S. Dept. of Fisheries),
Greg Stevens (DFO Hfx),
Warren Parsons (DFO Antigonish, Chair ZMAC 18),
Chuck Thompson (DFO Sydney, Chair ZMAC 19) and Florence Mancini (DFO, Sydney)

5. NEW INFORMATION BROUGHT FORWARD (what? By who?

- Swim-through conducted by staff of CBHNP on Clyburn River, Nov 11, in which 42 salmon were observed; more believed to be coming (Gordon Delaney)
- Late fall fish in St. Ann's Bay were not all thought to be of farm fish origins. (David Harding)

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- *Swim-through mark-and-recapture estimates may be too early for Middle and Baddeck rivers given proximity of juvenile densities to "norm" (could be possible but was not the case in 1993 when the Middle River was re-surveyed in November; trapnetting at Wagmatcook in 1998 was to have provided insight but didn't work out).*

- *Normal and above juvenile densities are inconsistent with general concepts of downward trending returns and escapements (draws into question the uncertainty of egg conservation requirements for Highland rivers)*

1. RECOMMENDATIONS:

a.) Pertaining to next year's work plans

- None

b.) Pertaining to next year's work plans

- Mid-July assessment of in-river returns to the Margaree (better yet were in-seasons on each of July 1 and August 1) as a basis for review of fishing plans.
- End of season (Oct) assessment of returns to the Margaree.

Other Concerns:

- Smelts as a forage food for salmon kelts need to restored to the lower reaches of Gallant River; resolution from Margaree Salmon Assoc. read to Fisheries Mgt, Antigonish, and expected to be submitted (again) to Science for action in 1999.

L. Marshall
NAME OF PRESENTER

L. Marshall
NAME OF RAPPORTEUR

1. SPECIES / STOCK:

- **Atlantic Salmon SFA 21**

  LaHave River, Morgans Falls Fishway counts as index for SFA 21.

2. ARRANGEMENTS:

DATE: June 15
TIME: 18:30
LOCATION: Riverside Community Hall, Bridgewater

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC.)

- ZMAC
- Chaired by Area Office Rep. Ian Marshall

4. PARTICIPANTS (Name and Affiliation)

- About 40 persons
- ZMAC board + observers
- MP for South Shore

5. NEW INFORMATION BROUGHT FORWARD (what? By who?)

- In-season forecast of final count by DFD representative P. Amiro.
- Indicated 97% chance of attaining conservation requirement.
- Hand out of model and forecast also included in minutes
- Initiated discussion on broodstock collection, J. Ritter and S. O'Neil

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- *Low water may affect counts.*
- *Caution in increasing exploitation.*

7 RECOMMENDATIONS:

a.) Pertaining to Assessment

- *Asked for next in-season as of June 30.*

b.) Pertaining to next year's work plans

- NA

Other Concerns:

- Impacts of acid rain and pH decline not adequately addressed.

P. Amiro
NAME OF PRESENTER

P. Amiro
NAME OF RAPPORTEUR

1. SPECIES / STOCK:

- **Atlantic Salmon – SFA 21**
  Salmon Fishing Area 21 - emphasis on LaHave River

2. ARRANGEMENTS: Bridgewater Office DFO

DATE: June 15, 1998
TIME: 18:30 – 22:00
LOCATION: Wandlyn Inn, Bridgewater, N.S.

3. FORM OF CONSULTATION (ZMAC – Science)

- Presentation of the in-season estimate for the LaHave River from Morgan Falls Fishway counts.
- Roundtable discussion of present status of salmon stocks in SFA 21 and throughout Atlantic Coast.

4. PARTICIPANTS (Name and Affiliation)

- six local river committees, ASF, NS DoF, C&P of the DFO, MP's representative.
- List included in minutes being prepared by the Bridgewater C&P office.

5. NEW INFORMATION BROUGHT FORWARD (what? By who?

- Returns to June 15, 1998 were 22 salmon, 10 wild and 12 hatchery.
- Forecasts of end of season count indicated a 0.8% chance that the conservation requirement of 1,320 fish would be counted in 1998.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- *That despite low counts there is room for a hook and release fishery.*

7. RECOMMENDATIONS

a.) Pertaining to Assessment

Other Concerns:

- The impact of hook and release angling on stocks not achieving conservation escapement be assessed.
- That another in season assessment be conducted on June 30, 1998.

Lack of presence of anglers on the river reduces protection of salmon

P. Amiro
NAME OF PRESENTER

P. Amiro
NAME OF RAPPORTEUR

1. SPECIES / STOCK:

- **Atlantic Salmon – SFA 21**
  Salmon Fishing Area 21 - emphasis on LaHave River

2. ARRANGEMENTS: LaHave River Salmon Association

DATE: June 23, 1998
TIME: 15:30 - 20:00
LOCATION: Arc Enterprises, Bridgewater, N.S.

3. FORM OF CONSULTATION (Stakeholder Consultation – Science)

- Open question and answer session.

4. PARTICIPANTS (Name and Affiliation)

- Four directors of the LRSA, one student of the LRSA, DFO biologist.

5. NEW INFORMATION BROUGHT FORWARD (what? By who?

- Returns to June 23, 1998 were 120 salmon and grilse at Morgan Falls.(DFO)
- That low productivity rivers in the Southern Uplands area of Nova Scotia have experienced returns less than that required for replacement of the population.(DFO)
- By at least one model of salmon recruitment using the habitat area of salmon and the predator population in the North Atlantic, little improvement in marine survival is forecast for 1998.
- If low marine survival persists remaining salmon stocks in the Southern Uplands which are impacted by acid precipitation and are characterized by less than average habitat quality, will decline.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response

- *That despite low counts there is room for a hook and release fishery.*
- *Some fish are being angled and no enforcement is apparent.*

7. RECOMMENDATIONS:

- The appropriateness of the 2.4 egg deposition target be reviewed.
- That even at returns less than requirements a hook and release fishery can be conducted and the potential losses (mortalities) mitigated by hatchery stocking.

Other Concerns:

- Lack of presence of anglers on the river reduces protection of salmon.

P. Amiro
NAME OF PRESENTER

P. Amiro
NAME OF RAPPORTEUR

1. SPECIES / STOCK:

- Salmon Fishing Area 21 - emphasis on LaHave River

2. ARRANGEMENTS: LaHave River Salmon Association

DATE: June 23, 1998
TIME: 15:30 - 20:00
LOCATION: Arc Enterprises, Bridgewater, N.S.

3. FORM OF CONSULTATION (Stakeholder Consultation - Science)

- Open question and answer session.

4. PARTICIPANTS (Name and Affiliation)

- Four directors of the LRSA, one student of the LRSA, DFO biologist.

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- Returns to June 23, 1998 were 120 salmon and grilse at Morgan Falls.(DFO)
- That low productivity rivers in the Southern Uplands area of Nova Scotia have experienced returns less than that required for replacement of the population.(DFO)
- By at least one model of salmon recruitment using the habitat area of salmon and the predator population in the North Atlantic, little improvement in marine survival is forecast for 1998.
- If low marine survival persists, remaining salmon stocks in the Southern Uplands which are impacted by acid precipitation and are characterized by less than average habitat quality, will decline.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- That despite low counts there is room for a hook and release fishery.
- Some fish are being angled and no enforcement is apparent.

7. RECOMMENDATIONS:

- The appropriateness of the 2.4 egg deposition target be reviewed.
- That even at returns less than requirements a hook and release fishery can be conducted and the potential losses (mortalities) mitigated by hatchery stocking.

Other Concerns:

- Lack of presence of anglers on the river reduces protection of salmon.

P. Amiro
NAME OF PRESENTER

P. Amiro
NAME OF RAPPORTEUR:

1. SPECIES / STOCK:
- Atlantic salmon, Buctouche River, 1998

2. ARRANGEMENTS:
DATE: 14 December, 1998
TIME: 1300
LOCATION: Buctouche First Nation Band Office, Buctouche, NB

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC.)
- Science Workshop

4. PARTICIPANTS (Name and Affiliation)
- Gary Atkinson - DFO Moncton
- Bill Sanipass – Buctouche First Nation
- Natalie LeBlanc – Southeastern Anglers Association
- Serge LeBlanc – Southeastern Anglers Association
- Rhéal LeBlanc – Southeastern Anglers Association
- Michel Goguen Southeastern Anglers Association
- Tom Pettigrew – NBDNRE
- Tim Lutzac – DFO Moncton
- Dave Dunn – DFO Moncton
- Bob Allain – DFO Tracadie-Sheila
- Ronald Caissie – Kouchibouguacsis River Association
- Louis Fontaine – Kouchibouguacsis River Association
- Yves Gallant – Kouchibouguacsis River Association
- Léophane LeBlanc – Kouchibouguac National Park
- Gerald Beck – Richibucto River Association

5. **NEW INFORMATION BROUGHT FORWARD (what? by who?)-*(Only a brief description is required)***
- Gary Atkinson presented preliminary results of the 1998 stock assessment indicating a significant decline in returns relative to 1997, with egg deposition only one third the conservation requirement. Juvenile survey data showed low but somewhat improved fry densities, reflecting the increased egg deposition observed in 1997. Overwinter survival of marked fall fingerlings appeared good, but the estimate of egg-to-fry survival, as in previous years, was below "normal".

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed). - (*Only a brief description is required)*
- The Southeastern Anglers Association, whose operation of a counting fence is crucial to the assessment, was concerned that continued operation, and assistance with electrofishing operations, could only be on an ad hoc basis because of uncertain sources of funding.

DFO has no means at present to directly fund such groups.

- The various representatives of angling associations were concerned that a closed angling season on southeast NB rivers would increase the incidence of poaching, and requested a hook-and-release only fishery, a position supported by Tom Pettigrew (NBDNRE). Bob Allain (DFO) pointed out the difficulties associated with this, in that mortality occurs in such a fishery, and First Nations have priority with respect to the resource. Also, it is DFO's position that rivers not expected to meet conservation requirements should not have a harvest.
- Clients were satisfied with the efficacy of the workshop/consultation process, and agreed to cooperate to the extent possible in maintaining the assessment of the stock.

7. RECOMMENDATIONS: (*Only a brief description is required)*

a.) Pertaining to Assessment

- To the extent possible, contingent on funding, maintain the current level of operation of mark/recapture facilities, and sampling for juvenile abundance. In the event that a mark/recapture capability could not be maintained, juvenile surveys should be continued as an index of spawning and future potential adult returns.

b.) Pertaining to next year's workplans

- No significant change from 1998.

Gary Atkinson
NAME OF RAPPORTEUR

In Miramichi and Southern New Brunswick (SFA 16)

1. Returns of grilse were up in 1998 therefore the outlook for 1999 is positive. (M. Hambrook) As well, it was proposed that returns were early, higher at barriers, juveniles increased, and mark/recapture may have missed the late run; therefore, the status is good for 1998 and no need for alarm for 1999. (P. Cronin)

Opposing view, decline in returns of grilse in the past three years and the unknown age composition of large salmon undermines the forecast and indicates a not so optimistic forecast for 1999 is just as likely. (P. Amiro, D. Meerburg)