DFO Atlantic Fisheries
Proceedings 96/1

Proceedings of Peer Review and Client Consultations for Diadromous Fish Stocks in the Maritime Provinces in 1995

Diadromous Fish Division
Maritimes Region
343 Archibald Street
Moncton, N.B.
E1C 9B6

April, 1996

PROCEEDINGS OF PEER REVIEW AND CLIENT CONSULTATIONS

FOR DIADROMOUS FISH STOCKS

IN THE MARITIME PROVINCES

IN 1995

DIADROMOUS FISH DIVISION
MARITIMES REGION
343 ARCHIBALD STREET
MONCTON, N.B.
E1C 9B6

April 1996

Table of Contents

Table of Contents

PART I PEER REVIEW

1. 0 INTRODUCTION

This report provides records of both the peer review meeting for assessing the status of the diadromous fish stocks in 1995 and the client consultation meetings held prior to the peer review meeting.

The Peer Review took place February 5-8, 1996, at the Gulf Fisheries Centre, Moncton, New Brunswick. Participants numbered 42 and, in addition to Diadromous Fish Division members, were comprised of individuals or representatives from provincial agencies (2), universities (3), one other federal agency, other Divisions of the Department of Fisheries and Oceans' (DFO) Regional Science Branch (3), DFO Headquarters Science, and client interests (Aboriginal, recreational and commercial fishing). The letter of invitation to clients and other interests outside DFO and both mailing and attendance lists are attached in appendices I.1, I.2 and I.3.

Seventeen stock assessment documents and three environmental overview papers were reviewed during the four-day peer review session (see Agenda in Appendix I.4). Twenty-seven referees (eight from outside DFO, four from outside Diadromous Fish Division, and four Division members that work outside the assessment program) contributed to the review of the 20 working papers (letter of invitation with instructions and list of referees attached in I.5 and I.6). Each paper was formally reviewed by two referees (two papers reviewed by three referees) and, also, was opened-up to questioning and comment from all the participants in attendance. One referee, absent from the Peer Review meeting, provided written comments which were presented by an attending referee. The comments and concerns, with the author's responses, are summarized in the rapporteur reports prepared for each of the 20 working papers presented and are detailed in sections 2.0 through 7.2 of this report. These same reports detail the research and management recommendations and, as applicable and feasible, the management advice for both the coming year and the long term.

Part II contains the written records of the client consultation meetings held prior to the Peer Review meeting. The purposes of these consultations were to provide a preliminary status report on the stocks to clients and other interested parties, to gather any additional information and insights that they might contribute, and to seek suggestions on how to improve the assessment in the future. Some of these consultations were conducted as science-only workshops while others were carried out under broader agendas usually dealing with a wider range of fisheries management aspects. Although there were inconsistencies in both meeting formats and written records among the various consultations, coverage of science matters was generally consistent.

2.0 ENVIRONMENTAL OVERVIEW

2.1 Freshwater Flows and Temperatures

Rapporteur: Gérald Chaput

Working Paper Title: Hydrological conditions for Atlantic salmon rivers in the Maritime Provinces in 1995

Author(s): Daniel Caissie

Referees: Ken Drinkwater
Walton Watt

Introduction

Information was provided on the hydrological conditions in 1995 for selected Atlantic salmon rivers within the Maritime Provinces. These conditions were compared to the long-term trends. Stream water temperatures obtained at several river systems in 1995 are described.

Concerns

Referees:

1. The Morell River is the river of interest in PEI but conditions must be inferred from the Wilmot River. This would be possible if the conditions in the Wilmot River are modeled to those of the Morell River using the historical time series. This procedure will be done for next year's presentation.
2. Warm temperature events would appear to be important for salmon since it is a cold water species. Some summarization such as number of degree days or even degree hours could be used as a measure of duration of critical temperature events.
3. Precipitation data are useful for describing the percent water yield of the basins, this is an indication of the amount of evapotransporation or retention capabilities of the watershed.

Others:

1. Conditions are variable across the Maritimes. Although more rivers than those presented are monitored, the data from many of these are not available until half a year later. Only selected index rivers are processed in short time frames.
2. For striped bass, winter conditions, especially duration, are very important. Winter duration could be inferred from indices such as ice cover and air temperatures.

Recommendations

1. If environmental data are important, then biologists should be using them to assess the health of the stock. At present, it is not clear in the assessments how the environmental conditions information is being used or how extreme conditions such as record low flows or high water temperatures may be impacting on the stocks.

2.0 ENVIRONMENTAL OVERVIEW

2.2 Freshwater Acidity Trends

Rapporteur: Shane O'Neil

Working Paper Title: Present status and trends for Nova Scotia acidified salmon rivers

Author(s): Walton Watt

Referees: Gilles Lacroix
Daniel Caissie

Introduction

The effects of acid precipitation and consequent river acidification were examined in relation to various other environmental variables and their combined effect on juvenile salmonid densities in streams which have had pH levels in the near-lethal range (~5.1-5.4). The area examined was the Southern Uplands of Nova Scotia over the period 1982 to 1994.

Concerns

Referees:

1. The objective of the paper was not clear.
2. It is inappropriate to combine data from 9 rivers which have a variation in level of pH as large as 0.5 units between them to describe a change in pH trend, over time, of only 0.1 units. Error bars should be included in the graph or the data should be subdivided into subgroups.
   Response: It is legitimate to use average monthly values in a covariance analysis. Placing error bars on the graph can be done but would make the graph busy.
3. Calcium levels vary among the rivers used in the analysis so again, it would be more useful to group more-similar rivers or report the data for each river independently.
   Response: There are some first-order interactions which may be addressed by dividing rivers into subgroups which can be examined.
4. Daily temperature fluctuations can be great and water sample collection may occur variously within the day. Using average temperature data to describe a potential long term change in pH, runs the risk of ignoring those smaller variations which might mask or exaggerate the true long-term effects of temperature.
   Response: The apparent long-term change in average temperature was observed but not anticipated. The gradually increasing trend in temperature (averages) was noted and dealt with in the analysis rather than being ignored.
5. Flow data should be included in the report particularly since DOC can be affected by flow.
6. The entire time series 1980-95 has been covered by the LRTAP work yet the report and analysis is restricted to 1981 to 1994.
7. The fry and parr data should be reported separately because the data would more accurately reflect the winter mortality for 0+ parr; winter low pH is what kills fish so should be used rather than mean annual pH. Figure 9 would "artificially" imply that the

pH situation is improving and that salmon survival rate is increasing. It should be reworked with fry and parr numbers separately and winter low pH values.

8. The electrofishing technique used to estimate juvenile salmon abundance needs to be described and any spawning stock size effect (on abundance) controlled for.
9. The apparent "cooling effect" of Mount Pinatubo may be exaggerated in your report because other nearby temperature monitoring stations do not show the same effect.

Recommendations

1. Average annual pH levels may show some slight improvement but may not reflect a decrease in the winter toxicity for salmon. Further examination of whether a change in the winter toxicity of pH to fish has occured is warranted.
2. Caution should be exercised in describing any change over the relatively brief 15-year time series. The evidence is not conclusive that change has occurred, but, perhaps, it demonstrates that the previously worsening acid impact has leveled off.

Fisheries Management Advice

1. The full international agreement (Clean Air Act Amendment in the U.S.) is expected to reduce sulfate emissions by 30 to 40% when it comes into effect in 2010. No major reduction in acid impact on affected rivers has been seen with decreases in emissions to date. Prospects for the future are uncertain but major change is unlikely over the next several years.

2.0 ENVIRONMENTAL OVERVIEW

2.3 Marine Conditions

Rapporteur: Larry Marshall

Working Paper Title: Marine environmental conditions in 1995 for Atlantic salmon

Author(s): Ken Drinkwater and R. Pettipas

Referees: Peter Amiro
Daniel Caissie

Introduction

Diadromous fish stocks spend a significant portion of their life at sea. Sea-surface temperatures have been implicated in the survival of salmon, their subsequent availability to distant fisheries and rate of return to home waters. This paper provided an overview of air temperatures, winds and atmospheric pressures, ice conditions and sea temperature of the Labrador Sea during the past three decades. Air temperatures, sea ice and near-sea-surface temperatures of the Labrador Sea, Gulf of St. Lawrence, Gulf of Maine and Scotian Shelf were also presented for 1995. The purpose of the paper was twofold: to inform diadromous fisheries workers of environmental conditions potentially useful in the investigation of abundances of diadromous fishes and to provide an overview of marine conditions to aid the interpretation of salmon return patterns.

Concerns

Referees:

1. No significant concerns were identified; referees found that new materials, definitions and explanations presented verbally were instructive and worthy of inclusion in the research document.

Others:

1. Group discussion centered on data series, their potential for explorative analysis as correlates with indices of stock abundance, and the potential for investigative partnerships with scientists in Physical and Chemical Sciences Branch, BIO. The presenter/author encouraged diadromous fishery workers to communicate hypotheses and data sets at their discretion.

3.0 ATLANTIC SALMON

3.1 Saint John and Other Outer-Bay of Fundy (SFA 23) Stocks

Rapporteur: Walton Watt

Working Paper Title: Status of Atlantic salmon stocks of the Saint John River and southwest New Brunswick, 1995

Author(s): Larry Marshall and Ross Jones

Referees: Alex Bielak
Kevin Davidson

Introduction

1. The assessment was primarily of the Saint John River Atlantic salmon stocks above Mactaquac dam. It was based on information from the Mactaquac fish counting and data collection facility at Mactaquac dam and hatchery. Also assessed were: the Nashwaak River (a tributary of the Saint John), using data from a counting fence; the Magaguadavic River (which flows into the Bay of Fundy at St George, N.B.), where there are salmon data from a trap in a fishway; and the St. Croix River (the USA/Canada border), using data from a fishway trap at the dam in Milltown, N.B.

Concerns

Referees:
1. The assessment for Nashwaak River depends on a number of assumptions about the similarity of its Atlantic salmon population to that above Mactaquac. Data should be collected from the river to verify these assumptions. Information being collected by Rec. Fish. groups may be helpful here. It is not acceptable to assume that the Atlantic salmon populations in all other tributaries of the Saint John have characteristics identical to those of the stocks above Mactaquac.
2. Last year's decision to remove and destroy aquaculture escapees caught in the Magaguadavic River trap may have come too late in the season to avoid serious genetic damage. This oversight should not be allowed to recur in 1996.

Others:
1. Serious doubt was expressed about the forecast of a possible 1SW surplus in the 1996 run to Mactaquac.
2. The Atlantic Salmon Federation has compared DNA from the present Magaguadavic stock to samples from the 1970's and found a significant change.

Recommendations

1. Do a modeling study of the Saint John River salmon stocks above Mactaquac to assess the hatchery role. This is especially desirable in the light of DFO's policy on divestiture of responsibility for the hatcheries. The aim is to try to assess the "true" contribution of hatchery

stocking on levels of "wild" salmon, and to answer the questions: Is the wild population sustainable without hatchery support? Would recruits per spawner improve if hatchery support were discontinued?

2. Aquaculture escapees have the potential to severely damage the genetic composition of wild salmon stocks in southwest NB. The wild stocks are especially vulnerable at present because of the low population levels. A firm policy decision is needed on the practice of removing and destroying escapees taken in counting traps. Steps should also be taken to correct this problem at the source before the native stocks of all of the rivers in the area become genetically compromised in the way that the Magaguadavic stock appears to have been.

Fisheries Management Advice

1. The forecast for 3800-4300 MSW salmon returns to Mactaquac in 1996 appears to be within acceptable limits of accuracy. This forecast is below the conservation requirement of 4800 MSW fish.
2. The forecast for 1SW fish returns (5800-6900) is subject to somewhat greater uncertainty. There is a possibility of a small surplus in grilse returns to Mactaquac (The conservation requirement is 3200 1SW fish). The in-season forecasting model should be used to monitor the returns and advise on allowable harvest levels.
3. None of the other rivers in this assessment are expected to meet their conservation requirements in 1996.

3.0 ATLANTIC SALMON

3.2 Inner Bay of Fundy (SFA 22) Stocks

Rapporteur: David Cairns

Working Paper Title: Status of Atlantic salmon Fishing Area 22, for 1995, with emphasis on inner Bay of Fundy stocks

Author(s): Peter Amiro and Eric M. Jefferson

Referees: Tim Martin
Gérald Chaput

Introduction

This review covers rivers in the Bay of Fundy beginning east of the Saint John and extending around the upper part of the Bay to and including the Bear River, Nova Scotia. Salmon from these rivers remain within the Bay of Fundy-Gulf of Maine during their at-sea period. These 20-some stocks are collectively referred to as the inner Bay of Fundy stocks. Inner Bay rivers have been closed to salmon fishing since 1989 because of low escapement. The Big Salmon (NB) and the Stewiacke (NS) are index rivers for the inner Bay stocks.

Concerns

Referees:

1. Emphasis should be placed on obtaining reliable data for the Big Salmon and Stewiacke rivers because these are index rivers for the inner Bay stocks.
2. The invasion of aquaculture escapees is a significant threat to local fish stocks.
3. Stocking of fish from the Big Salmon sea-cage project needs documentation, particularly since the Big Salmon is an index river. Stocking plans also need to be taken into consideration when predicting future runs.

Others:

1. Concern is broad about the health of the inner Bay of Fundy ecosystem. Salmon declines, attributed to a fall in marine survival, may be an index to broader ecological problems. This issue should be tackled more vigorously. Science should take a stronger stand, making bold statements. A scientific conference to explore resource problems in the Bay should be organized.
2. Provisions of the Fisheries Act protecting fish and their habitats are widely ignored. These provisions should be enforced.
3. Greater coordination between various groups interested in inner Bay salmon would be beneficial. Such coordination could be promoted by including in the Research Document a list of current projects by these groups and a list of projects that would be useful to be undertaken.
4. The sea-cage method of stocking should be monitored and evaluated. Tetracycline marking would allow subsequent identification of these fish.

Recommendations

1. A scientific working group should be established to examine fish resource problems of the inner Bay of Fundy.
2. Elemental analysis of otoliths should be used to shed light on the at-sea migratory behaviour of inner Fundy salmon. This would require lethal sampling.
3. DFO should develop the capacity to do genetic analysis for stock identification.

Fisheries Management Advice

1. Stewiacke River: With declining juvenile abundance, returns will not improve unless marine survival rebounds. There is little prospect of improvement in this stock in the immediate future. No fishery should be permitted unless the escapement target is consistently met for a period of at least three years.
2. Gaspereau River: No surplus above spawning requirements is foreseen for 1996. This river's major problems stem from water control practices of a hydroelectric power system. Water management options that would be more favorable to salmon should be explored, in view of the termination of the current water rights agreement in 1997.

3.0 ATLANTIC SALMON

3.3 LaHave and South Shore Nova Scotia (SFA 21) Stocks

Rapporteur: Carolyn Harvie

Working Paper Title: **Status of Atlantic salmon in Salmon Fishing Area 21, in 1995, with emphasis on the area above Morgan Falls fishway on the LaHave River, Lunenburg Co., Nova Scotia**

Author(s): Peter Amiro, Eric Jefferson and Carolyn J. Harvie

Referees: Fred Whoriskey
Gilles Lacroix

Introduction

Salmon stocks of SFA 21 are composed of about 16 rivers, many of which are impacted by water acidification of the and by hydroelectric development. Counts of salmon at the Morgan Falls fishway, on the LaHave River, provide an index of returns to SFA 21.

Concerns

Referees:
1. Resolve differences in reports of whether the LaHave River is acid-impacted or not.
2. Concern was expressed on the use of B. Tufts data to estimate a 10% hook-and-release mortaility.
3. Concern was expressed about the use of 1320 fish as a revised conservation requirement above Morgan Falls. Is the change to that target to be the conclusion of the document?
4. Concern was expressed about the effect of hatchery stocking (i.e., Medway). Suggestion to look at the sensitivity of extinction to stray rate into waters with acid toxicity.

Others:
1. Run ASRAM under pH neutral and compare optimum escapements.
2. How do you resolve differences between Ricker and ASRAM target numbers of spawners?
3. Should Annapolis River be included in this SFA 21 document? Annapolis currently lies in SFA 22.

Recommendations

1. Conduct experiments providing additional basin-wide estimates of the salmon population in the LaHave River.
2. Determine unrecorded fall-back rate at Morgan Falls.
3. Analyze juvenile data for estimation of production below Morgan Falls.
4. Set up and run ASRAM for the entire LaHave River.
5. Look at the sensitivity of extinction to stray rate into acid-impacted rivers.

6. Look at revising the target for LaHave River.
7. Look at various management scenarios for the Medway River, and define its conservation target.
8. Can the estimation of total returns be repeated for another year (as in mark-recapture experiment in 1983)?

Fisheries Management Advice

1. For LaHave River, conservation targets are expected to be met in 1996, but caution is recommended as is use of an in-season assessment to prevent over-exploitation.
2. There should be no increase in exploitaiton for SFA 21, except in those rivers where there is no conservation concern because runs are entirely dependent on hatchery stocking (e.g., Mersey, Clyde).

3.0 ATLANTIC SALMON

3.4 Eastern Shore Nova Scotia (SFA 20) Stocks

Rapporteur: Dick Cutting

Working Paper Title: **Estimates of Atlantic Salmon Stock status on the eastern shore of Nova Scotia, Salmon Fishing Area 20, in 1995**

Author(s): Shane O'Neil, Carolyn Harvie and D.A. Longard

Referees: Nancy Adams
Gary Atkinson

Introduction

SFA 20 has about 20 rivers that are angled for Atlantic salmon; 16 rivers had catch or effort reported for them in 1995. The majority of the rivers is stressed by acid precipitation with depressing effects on those stocks. The stocks have a predominance of one-seawinter fish with a few two-seawinter fish (mostly in three rivers). The St. Mary's River also has a small three-seawinter component that continues to persist.

Concerns

Referees:

1. The first referee highlighted the need for identification of the conservation requirements for acid-stressed rivers, if different from the 2.4-egg/m^2 interim standard. Moreover, uniform derivation of conservation requirements and presentation in a summary table would enhance reader understanding.
2. The proposed in-season assessment method using one-sea-winter catches at two pools was noted with some scepticism, and some favour for a mark-recapture method was stated.
3. Concern was expressed that for two rivers with significant multi-seawinter fish (Musquodoboit and Salmon (Guys.)) there were few data -- even conservation requirements were missing.
4. The second referee solicited the inclusion of a summary table of base information on the various rivers in the SFA.
5. Concern was indicated that there will be bias in the in-season assessment method on the St. Mary's River if the threshhold number for management decision to commence retention angling is known in the community.
6. Different methods for habitat estimation are used on different rivers without clear justification.
7. Concern was expressed about using LaHave data for forecasting returns on the St. Mary's River.
8. It was noted that the St. Mary's River juvenile levels are quite stable considering that spawning escapements have deteriorated over the last decade.

Others:

1. Other concerns included: request for the addition of a table of enhancement activities in SFA 20; the conservation requirement for the St. Mary's River has few multi-seawinter fish and many one-seawinter fish, including an apparent 50% egg deposition by the latter; the desirabiity of having a table showing the under-escapement history and estimates of the proportion or portions removed by the fisheries; the observation that , if the exploitation rate on the St. Mary's River were lower in 1995 than usual, and, if the return estimate is underestimated, the conservation requirement may have been fulfilled; and there is a need to identify in-stream straying rates to evaluate the efficacy of controlling spawner use of the tributaries or waters with pH toxic to juvenile salmon.

Recommendations

1. More electrofishing is needed on the St. Mary's River .
2. More effort should be directed to determining the salmon status of the Musquodoboit and Salmon (Guys. Co.) rivers.

Fisheries Management Advice

1. The small remnant salmon population in the West River (Sheet Harbour) will have no fish above those required for conservation -- the stock is in great danger of extinction, no harvest is recommended.
2. Returns on East River (Sheet Harbour) will be primarily of hatchery origin and no conservation requirement concern exists, so exploitation can be permitted.
3. In all other acid-stressed rivers of SFA 20, excepting the following three rivers, there is no prospect of salmon returns surplus to conservation requirements.
4. Salmon returns to the St. Mary's River in 1996 are not expected to meet conservation requirements, but the client angler group will be persistent about operating to test the in-season indexing method.
5. It is not possible, based on available information, to offer usable advice on the salmon stocks of the Musquodoboit and Salmon (Guys. Co.) rivers.

3.0 ATLANTIC SALMON

3.5 Cape Breton (SFA 19 and part of 18) Stocks

Rapporteur: Tim Lutzac

Working Paper Title: Status of Atlantic salmon stocks of the Margaree and other selected rivers of Cape Breton Island, 1995

Author(s): Larry Marshall, Ross Jones, Paul LeBlanc and Leonard Forsyth

Referees: Dave Meerburg
Alyre Chiasson

Introduction

This group is composed of more than 33 salmon stocks occupying rivers throughout Cape Breton Island, Nova Scotia. The six major stocks are characterized as mixed large salmon and grilse runs with late-run large salmon predominant in an early-late return (Margaree River), late-run large salmon predominant in late returns (Middle, Baddeck and Sydney rivers), early-run large salmon dominate early returns (North River) and early-run grilse predominant in one riiver (Grand River). Spawning targets in 1995 were exceeded in Margaree, North and above the falls in Grand River, but were not met in the other three rivers.

Concerns

Referees:

1. Concern was raised over the failure of the grilse spawning escapement to meet the required target on the Margaree River. As a result, the male:female ratio for spawners was less than 1:1. Despite the fact that the addition of sufficient grilse males to spawning requirements to bring the ratio to 1:1 is a standard feature of Atlantic salmon stock assessments, there was disagreement as to whether or not this ratio was required.
2. Concern was expressed over the comparability of trap net data between years due to improvements in trap net efficiency brought about by site relocations and modifications to gear. It was pointed out that the initial purpose of the trap was to apply as many tags as possible to improve mark and recapture population estimates. The long-term objective was to calculate trap efficiency so that tagging could eventually be eliminated with run estimates based on trapnet index counts alone. There was substantial discussion but a lack of consensus on this subject and related issues. Suffice it to say that differences concerning stable versus variable trap net efficiencies between rivers may be watershed-specific and related to factors such as the location of traps relative to the head of tide.
3. Concern was expressed over the effect of multiple recaptures in the hook-and-release sport fishery on angler exploitation rates and possible miscalculation of total river returns. Cape Breton Highlands National Park staff have reported exploitation rates on grilse runs of 90 per cent. Hook-and-release rates may be very high.
4. Given the shrinkage of available winter salmon habitat in the Labrador sea, concern was expressed over the continued stocking of salmon smolts for the purpose of sea ranching.

5. Concern was raised about the number of aquaculture fish that may be reaching spawning escapement in Baddeck and Middle rivers from Bras D'Or Lake and the fact that we know little about their contribution to spawning in these rivers. About 20,000 fish were estimated to have escaped in 1995.
6. Concern was raised that we may be in error in the way we set up spawning targets for salmon in rivers where they co-exit with sea-run brook trout. The lack of trends showing increasing trout densities and decreasing juvenile salmon densities in an up-river direction on some rivers suggests possible habitat or inter-specific problems. We may need to develop a more complex model that takes into account the overlapping habitat between salmon and trout when we establish target spawning escapements for salmon.

Others:

1. Concern was raised over the lack of progress noted on the use of ultrasonic tags to study the movements of tagged salmon in the Margaree River. Dr. Marshall indicated that the 1995 exercise was implemented due to impending staff retirements and that a detailed plan would be prepared for the 1996 phase of investigations. The objectives were to pass on knowledge of the operation and limitations of the equipment to staff who would be using it in the Margaree and other rivers and to expend non-reusable tags while gaining some practical field experience.

Recommendations

1. A follow-up experiment to gain further insight into the movement of Carlin-tagged salmon used in mark and recapture population estimates, through the application of ultrasonic tags to Carlin-tagged fish, should be implemented in 1996.
2. Examination of the incidence of multiple captures of large salmon and grilse in the hook-and-release sport fishery is required to determine the error in the calculation of exploitation rates.

Fisheries Management Advice

1. Salmon returns to the Margaree River in 1996 will meet or exceed spawning requirements. Large salmon returns will double the spawning target. Any retention fishery should include the harvest of large fish allocated in proportion to their returns in early and late segments of the run to the river. Grilse returns will approximate spawning requirements. The spawning target will not be meet the 1st ratio, however, if a retention fishery for grilse is permitted.
2. Salmon returns for 1996 to the North River are expected to exceed spawning targets but to a lesser degree than for the Margaree River. Any retention fishery should include the harvest of grilse and large salmon allocated in proportion to their returns in early and late segments of the run and in proportion to the salmon:grilse ratio evident in returns to the river.
3. Returns for 1996 to the Middle and Baddeck rivers are not expected to exceed those levels of 1995. Spawning targets will therefore not be met.
4. There is no basis for forecasting returns to the Sydney River in 1996.
5. Salmon returns for 1996 to the Grand River above Grand Falls are expected to exceed spawning targets. A surplus of grilse will be available for harvest. There is no forecast for returns to the river below Grand River Falls.

3.0 ATLANTIC SALMON

3.6 Northumberland Strait Nova Scotia (part of SFA 18) Stocks

Rapporteur: Tim Lutzac

Working Paper Title: **Estimates of Atlantic salmon stock status on the northern shore of mainland Nova Scotia, in 1995**

Author(s): Shane O'Neil, D.A. Longard, and C.J. Harvie

Referees: Dick Cutting
Nancy Adams

Introduction

This group is composed of about 15 salmon stocks occupying rivers entering the Northumberland Strait on the north shore of mainland Nova Scotia. The stocks are characterized as mixed large salmon and grilse runs with big fish predominant in fall returns to fresh water. Although the spawning target in East River (Pictou) may not have been met in 1995, returns to the rivers of this area, as indicated by those to River Philip and West River (Antigonish), met or exceeded spawning requirements in 1995 and have remained healthy for several years.

Concerns

Referees:

1. Concern was expressed over the advisability of using angler stub returns to calculate river returns when the need for correction factors and the degree to which they should be applied was uncertain.
2. Concern was expressed over the use of tag return data from the sport fishery, in a river supporting mixed early- and late-run stocks, to calculate returns to rivers that support late run stocks exclusively. In the case of the Margaree River tag return data used in this paper, early- and late-run tags could not be completely separated to provide an accurate estimation of exploitation of the late-run component of the Margaree stock. The problem was addressed by re-working the Margaree data to try and eliminate all early-run fish from the data. The revised exploitation rates applied to the calculation of river escapements for Northumberland Strait Rivers were, as a result, increased from 12.1 % to 15.0 % for large salmon and from 25 % to 45 % for grilse. The new exploitation rates were applied to unadjusted stub return data for the Northumberland Strait rivers.
3. It was suggested that mark and recapture based in the river estuaries might provide population estimates with narrower confidence limits. This would permit a better quantification of any estimated surplus to spawning requirements that might occur. Mr. O'Neil indicated that it has been the intent to do some tagging at estuarial traps this year, but that a variety of problems prevented this work from being carried out.
4. Concern was expressed that the conclusions being presented on stock status in the working paper were not strong enough. The data analyses completed and presented to date should be the basis of more specific conclusions. Mr. O'Neil agreed and indicated that spawning target requirements were approximated or exceeded. Further, since angling rates were probably overestimated, most rivers in the area likely received a

surplus of spawners. Finally, the stocks returning to most of these rivers could afford a higher exploitation rate than has occurred in recent years, because the late fall angling season is usually so abbreviated.

Others:

1. A variety of questions directed at various aspects of the use of stub information and tag return data from the sport fishery reinforced concerns expressed by the referees, including a suggestion that the stub return data may very well be accurate without adjustment.

Recommendations

1. Mark-and-recapture projects to estimate total return of Atlantic salmon to the river should be initiated in the estuaries of River Philip and East River (Pictou) in 1996.

Fisheries Management Advice

1. Forecasts based on five-year averages indicate that there will be about 25 percent more large salmon returning to River Philip, East River (Pictou) and West River (Antigonish) in 1996 than are required to meet the respective spawning targets.
2. Applying the same approach for small fish as used to forecast large salmon, significant numbers of grilse surplus to the respective spawning targets for these same rivers are expected in 1996.
3. Strong juvenile densities in these rivers bode well for these stocks in the foreseeable future.

3.0 ATLANTIC SALMON

3.7 Prince Edward Island (SFA 17) Stocks

Rapporteur: Carolyn Harvie

Working Paper Title: **Status of Atlantic salmon in the Morell, Mill, Dunk, West, and Valleyfield rivers, Prince Edward Island, in 1995**

Author(s): David Cairns, Randy Angus, Michael Murray and Kevin Davidson

Referees: Daryl Guignion
Tim Lutzac

Introduction

Prince Edward Island salmon stocks are composed primarily of early-run, hatchery-stocked small salmon. Some are commonly found in only a few of the larger rivers, particularly the Morell River, which accounts for 95% of the catch for the Island.

Concerns

Referees:

1. Salmon circumvent the trap at Leard's Pond and thus are not being enumerated. Given the importance of counts at this fishway, the route from the river into the pond should be made secure so that all salmon must pass through the trap.
2. Should we be doing an assessment on a stock which is primarily stocked grilse?
3. Future research, planning and direction should involve the local communities and anglers.
4. Information from smolt traps is inconclusive because of timing of trap installation or storm events.
5. The effects of sediments and other environmental effects on survival.

Others:

1. Given the percentage of smolts stocked above Leard's Pond (hatching year 1992), a disproportionate number of small salmon is returning to the same location in the next year.
2. Which percent of target met should be used, above Leard's Pond or below, given that the estimates of target met are so different?
3. The sex ratios of smolts and returning salmon are very different; returning salmon are primarily male.
4. Extrapolations are being made of juvenile electrofishing data to total juvenile populations without specific habitat data.

Recommendations

1. Investigate ways of improving the counts at Leard's fishway.
2. Annual estimates of total returns to the Morell River are required. Suggestions were to run a partial-count fence for marking a seining-and-marking program.

3. Determine the development potential of a self-sustaining salmon run.

Fisheries Management Advice

1. The 1996 returns should be managed similar to 1995, i.e., no increase in exploitation is recommended.
2. Without stocking of hatchery fish, there will not be a significant fishery and spawning targets will not be met.

3.0 ATLANTIC SALMON

3.8 Miramichi (within SFA 16) Stock

Rapporteur: Kevin Davidson

Working Paper Title: Stock status of Atlantic salmon (*Salmo salar)* in the Miramichi River, 1995

Author(s): Gérald Chaput, M. Biron, D. Moore, B. Dube, C. Ginnish, M. Hambrook, T. Paul, and B. Scott

Referees: Dave Meerburg
Carolyn Harvie

Introduction:

The Miramichi River system supports the largest Atlantic salmon population in North America. This salmon population is composed of several stocks which exhibiit two run times (early and late). The river is composed of two major branches, the Northwest Miramichi and the Southwest Miramichi, which share a common estuary which subsequently drains into the Gulf of St. Lawrence. Salmon population assessments are done for each of the major branches and for the system as a whole.

Concerns

Referees:

1. Suggested additions to the paper included: clarification of the methods used for calculating emigration rate and recapture matrices; graphs of egg deposition over time for both main branches broken down into large and small salmon contributions and of discharge versus run-timing; and a discussion of the probability density functions used.
2. The use of mean angling catch for 1990-1994 instead of 1995 angling (FISHSYS) statistics was questioned. It was noted that these statistics were not available in time for inclusion in the 1995 assessment and would be presented next year.
3. The statement that large salmon production on the Miramichi has increased contradicts the results of analyses of trends in total North American large salmon production in relation to winter habitat indices at sea and this apparent trend may actually reflect changes in the percentage of multiple spawners in the system.

Others:

1. The extension of the angling season on the Little Southwest Miramichi despite public concern over the status of the salmon stock in this river was questioned. It was noted that time limitations did not permit changing this season extension but that, in response to public concerns, angling would be restricted to catch-and-release only in 1996.

Recommendations

Research:

1. Development of a predictive capabilty for small salmon and estimates of marine survival based on estimates of smolt production and/or electrofishing and flow data should be pursued.
2. Electrofishing data should be reviewed to determine if there is a density effect on the growth of fry and parr.
3. Fecundity information should be reviewed along with the fecundity data used to develop the egg targets.
4. Age composition data should be updated and an analysis of age structure over time in relation to management measures (commercial closures) and winter marine habitat indices should be undertaken.

Fisheries Management:

1. The possibility of developing targets for early- and late-run components of the population should be investigated.
2. Development of further subdivision of assessment to various tributaries, such as the Little Southwest , Renous/Dungarvon systems, should be encouraged.
3. It would be useful to be able to state what additional harvest by size could have occurred in 1995 while at the same time achieving certainty that conservation would not have been affected.

Fisheries Management Advice

1. The probability that conservation targets will be met or exceeded for both the Northwest and Southwest Miramichi rivers in 1996 is high (81%).
2. To avoid differential exploitation of early- and late-run stocks, exploitation of both large and small salmon in the early- and late-run components of the population should be proportional to the composition of these runs - i.e., for large salmon - 20% early-run and 80% late-run; for small salmon - 40% early-run and 60% late-run.

3.0 ATLANTIC SALMON

3.9 Bouctouche (within SFA 16) Stock

Rapporteur: Rod Bradford

Working Paper Title: Status of Atlantic salmon in the Bouctouche River in 1995

Author(s): Gary Atkinson and Gérald Chaput

Referees: Allen Currie
Tim Lutzac

Introduction

Bouctouche River is located in southeastern New Brunswick in SFA 16. The spawning target of 268 large salmon and 189 small salmon has not been met since the inception of sampling in 1993.

Concerns

Referees:

1. Attendees and referees expressed concern that spawning target was not met again in 1995 (50%).
2. It was generally agreed that greater co-ordination of sampling between DFO and its partners/clients is required. Specifically,
   - the method of electroseining (open versus closed sites) needs to be consistent.
   - more rigourous harvesting versus sampling protocols for First Peoples food fishery traps should be developed; i.e., when to harvest versus when to sample in order to ensure that both requirements are satisfied.
3. Issue was made regarding the differing capture efficiency between the mark and recapture traps. However, no other sites within the estuary are suitable for interception of salmon.
4. There is no possibility for providing in-season advice regarding availability of surplus fish for harvest.
5. Although the estimate of rearing habitat for this river is of higher quality than for many other salmon-producing rivers, the accessibility/use of this habitat by salmon and the applicability of the egg deposition target of 2.4 eggs/m^2 were questioned. Verification that this level of deposition is appropriate for this river is required.

Recommendations

Research:

1. More extensive electrofishing surveys should be conducted to determine the amount of habitat in the system currently being utilized by salmon.
2. Bycatch of salmon in smelt nets (poaching) occurs in the estuary below the mark and recapture traps. Therefore, calculated population estimate need only be corrected for poaching to obtain estimate of spawner abundance.

Fisheries Management Advice

1. The failure to meet spawning requirements for the third consecutive year, coupled with apparently low juvenile densities in the system, indicates that the conservation target will not be met during 1996 and, therefore, there will not be a harvestable surplus.

3.0 ATLANTIC SALMON

3.10 Restigouche (within SFA 15) Stock

Rapporteur: Peter Amiro

Working Paper Title: Status of Atlantic salmon in the Restigouche River in 1995

Author(s): Andrea Locke, Russell Pickard, Fran Mowbray, G. Landry, Allen Madden and P. D'Amours

Referees: Fred Whoriskey
Shane O'Neil

Introduction

Assessment of the Restigouche River salmon stock is conducted using data from: 1) a mark-and-recapture experiment, 2) angling data and minimum (0.3) and maximum (0.5) exploitation rates, 3) visual counts of salmon, and 4) juvenile salmon population densities derived at 13 standard sites. Removals of MSW salmon are made from First Nations catches and Quebec angling and 1SW salmon are removed by First nations, Quebec angling and New Brunswick angling.

Concerns

Referees
1. Re-estimates of mark-recapture data, performed *aposteriori*, may not be valid.
2. What method(s) is/are suitable for future assessments?
3. Diver counts in large pools are underestimates and their accuracy needs to be resolved. This is being addressed via video-taping salmon in pools.
4. Because of the small number of recaptures reported, should mark-and-recapture estimates be given equal weighting in the document?
5. Low water may have affected angling success in some or most of the waters and estimates based on angling exploitation rates may be under-estimates.
6. Use of a uniform exploitation rate for grilse and salmon was questioned in regard to other rivers where a range of rates is used.

Others:
1. If tagging mortality is > than 10%, this may not be tolerated by user groups.
2. Canoe counts estimate was close to the 0.3 exploitation rate estimate.
3. Quebec First Nation catch needs to be explained that it is an average and not a 1995 reported catch.
4. Quebec First Nation catches are not reported.
5. Reported tag recaptures at barrier fence were lower than expected. This is because DNRE did not collect tag recapture data at the Upsalquitch barrier.
6. Juvenile population densities have been increasing but escapement numbers have declined. Why?
7. Diver counts only cover 75% of the river and are therefore minimum estimates.

8. Egg depositions may have increased despite declining escapement because the size of fish may have increased since 1984.
9. Diver counts (i.e., minimum estimates) suggest an angling exploitation rate lower than 0.3.
10. The Upsalquitch data need to be presented in the assessment.
11. Need to use some sort of non-reporting rate for camp data for tag recaptures (100% is based on phone survey).
12. Juvenile densities need to be presented in more detail and analyzed.
13. Stock-recruit analysis should be carried out on Upsalquitch data.
14. Furunculosis may pre-dispose Restigouche fish to tagging mortality. Therefore the mark-recapture technique may not be acceptable to all interests.

Recommendations

Research:
1. Target egg depositions should be re-evaluated. Scale samples need to be derived from all harvest fisheries.
2. Harvest data must be obtained from all sources.
3. Alternative methods for deriving population estimates, such as diver-based spawner counts, need to be considered.

Fisheries Management Advice

1. No estimates indicated targets were exceeded, and conservative estimates indicated the conservation target was not met.
2. No data indicated that returns will increase in 1996.
3. Annual estimates of juvenile salmon densities continue to increase slowly.

3.0 ATLANTIC SALMON

3.11 Nepisiguit (within SFA 15) Stock

Rapporteur: Gary Atkinson

Working Paper Title: Status of Atlantic salmon in the Nepisiguit River, New Brunswick, 1995

Author(s): Andrea Locke and Fran Mowbray

Referees: Allen Currie
Kevin Davidson

Introduction

Depleted wild stocks in the Nepisiguit have been rebuilt over the last several decades by hatchery stocking. The present stock is composed of about equal numbers of large and small salmon, and there is both an early-and late-run component.

Concerns

Referees:

1. The validity of the angling data provided by the Nepisiguit Salmon Association (NSA) was questioned, especially since they don't match DFO C&P or FISHSYS figures. Although some uncertainty was expressed concerning Association data, it was felt that they were more carefully collected than other data.
2. It was suggested that DFO obtain and archive the data now in the custody of the NSA, to ensure its accessibility.
3. Quality control on all data generated outside DFO and used in assessments was a concern. It was agreed that while quality could not always be strictly controlled, data and methods were scrutinized for consistency and appropriateness.
4. The use of stock characteristics as determined from broodstock at the DFO Charlo hatchery was suggested as more appropriate than those currently used to generate the conservation target.
5. The data relating redd counts to number of females and estimated spawning escapement were inconsistent. It was felt that such counts should not be used as a quantitative way of assessing spawning, but could be useful as an index.
6. Concern was expressed that there were many assumptions and uncontrollable variables in the model used to estimate returns and escapement. Examples given were habitat quality, egg deposition rate and tagging mortality. It was agreed that many assumptions were made, at the same time pointing out that these were tested when possible.
7. It was questioned why all tags applied in the estuary were not seen at the counting fence. This might be explained by the early removal of the fence and delayed upstream migration due to low water.
8. The interpretation of increased juvenile densities at certain sites was considered potentially misleading, in that decreased quality of secondary habitats could be concentrating juveniles at prime sites.

9. The stocking evaluation suggested that only modest returns have accrued from stocking. It was therefore questioned whether continued effort could be justified. It was pointed out that with the imminent closure of DFO hatcheries this issue would have to be addressed in future by the user groups who will be paying the cost.

Others:

1. The stocking evaluation was considered too general and didn't account for density-dependent factors, stocking when there were few wild fish, or the fact that many stocked fish were not fin-clipped. A suggestion was made to examine stocking effects on the early run, which was the initial target of the program. It was agreed to attempt this analyses, although the early-run is not well sampled and the data may be inadequate.
2. The habitat area used to calculate the conservation target is poorly documented which may be too high, considering that optimum egg deposition appears to be less than 2.4. The habitat data will be reviewed.

Suggested additions to the document were:

1. An explanation of the regression applied to the counting fence data.
2. An appendix of values used in the stocking evaluation model.
3. A table indicating the proportion of adipose - clipped fish over time.

Recommendations

Research:

1. Re-evaluate the effects of stocking, with particular emphasis on the early-run, to determine if continued stocking is required to maintain that component.
2. Re-evaluate the habitat survey data.
3. Conduct a holding tank experiment to determine tagging mortality for adults.

Fisheries Management Advice

1. The Nepisiguit River has not met conservation spawning escapement in the past four years. It is unlikely that there will be a harvestable surplus of salmon in 1996, or in the immediate future.

3.0 ATLANTIC SALMON

3.12 Chaleur Bay (SFA 15) Stocks

Rapporteur: Daniel Caissie

Working Paper Title: Status of Atlantic salmon in Salmon Fishing Area 15, New Brunswick, 1995

Author(s): Andrea Locke, Fran Mowbray, Russell Pickard and Allen Madden

Referees: Fred Whoriskey
Rod Bradford

Introduction

SFA 15 encompasses all rivers that flow into the Chaleur Bay and includes the Acadian Peninsula. It has many small rivers for which information is limited. Of these rivers, a salmon stock assessment was provided for the Jacquet River, based on barrier fence returns. Assessments also are carried out for the larger rivers in the SFA, i.e., Restigouche and Nepisiguit rivers.

Concerns

Referees:

1. Good results are obtained from the Jacquet River fence. What about for the other locations within the SFA? If the Nepisiguit Salmon Association (NSA) is collecting data for some of the other locations, does the data collection include a well-defined plan? If not, maybe we should be talking to NSA about the need for such a plan.
   The NSA has a good electrofishing crew and they usually carry out their data collection on the Nepisiguit first and then they carry out electrofishing at other locations depending on time remaining.
   Electrofishing site selection in the SFA should be carried out with specific objectives.
2. What was the summary or conclusion for 1995?
   During 1995, the grilse returns were low.
3. In the food fishery statistics, the weight of the harvest is presented. Why?
   The information on weight is provided because this information is important for reporting to ICES.
4. It was suggested that the summary sheets for the Restigouche and Nepisiguit rivers be included in the SFA 15 document.
5. Suggestions were also made to collect biological characteristics data, such as length, weight frequency, etc, through groups and associations collecting information when possible, since such information could be very useful.
6. What is DFO's involvement in these small river systems?
   The involvement by DFO in many of the smaller rivers was to assemble and document the data collected by non-DFO groups.
7. We may have to think of other approaches to collecting data in future, if funding for some of the present groups ceases to be available.

   Most of the data collected in SFA 15 by outside groups come from the NSA which is to some extent a self-funded organization.
8. Was the Little River fish kill related to rainfall events?
   No, the fish kill on Little River was due to the fish moving into Little River with the tide and being trapped in the acid waters from the industry when the tide receded.
9. The estimate of poaching on the Jacquet River at 16% may be high given that the run was so late this year.
   Yes, however, the value at 16% results in a conservative estimate of spawning escapement.

Recommendations

1. It was recommended that the monitoring at the Jacquet River fence be continued because the information was very important.

Fisheries Management Advice

1. Based on the three most important rivers in the SFA 15 region, data showed that grilse returns were low in 1995.
2. Pertaining to the Jacquet River, effort should be made to collect biological characteristics data for this stock.
3. The two past years of fence counts indicate the conservation target was exceeded; no problem is expected in meeting the target on the Jacquet River in 1996.

4.0 STRIPED BASS

4.1 Miramichi Striped Bass Stock

Rapporteur: Brian Jessop

Working Paper Title: Status of Striped Bass (*Morone saxatilis)* in the Gulf of St. Lawrence

Author(s): Rod Bradford and Gérald Chaput

Referees: Alyre Chiasson
Alex Bielak
Carolyn Harvie

Introduction

Striped bass in the Gulf of St. Lawrence are highly variable in abundance and appear to be derived from a single Miramichi River spawning stock, estimated at 40-80 thousand fish in 1995. Males greatly outnumber females in the spawning stock, the 1991 year-class will provide the bulk of spawners through to 1998, a variably large bycatch of adult striped bass occurs in fisheries throughout the lower Gulf of St. Lawrence, and variable, often high, bycatch of juvenile striped bass occurs in the gaspereau and smelt fisheries in Miramichi Bay.

Concerns

Referees

1. Noted that the management plan objectives to arrest declining striped bass abundance and increase stock size have recently been met but that no estimate is available of the numbers of striped bass supportable by the habitat. The research effort necessary to evaluate habitat support capacity depends upon budget priorities.
2. Although high bycatches of young and adult striped bass, at present stock size, suggest a stock at risk, the role of environmental factors in regulating stock abundance was recognized. The lack of regulations sufficient to control bycatch was of concern. Proposed bycatch control methods all have major effects on othre fishery catches. The selection of bycatch control method will be made by fishery managers following stakeholder consultations.
3. The assumption of constant catchability of striped bass in traps was questioned since it forms the basis of the catch based estimate of abundance. Research to investigate this topic was proposed.
4. The large confidence intervals about the mark-recapture population estimates reduced confidence in the conclusion that striped bass abundance increased before 1993 and 1994. Precision of population estimates depends upon the quantities of fish marked and recaptured and is subject to uncontrollable conditions. Every effort is made to increase sample sizes.
5. The dependence of the striped bass stock on a single year-class for near-future success was of concern and warrants appropriate protective measures. Other populations of spawning striped bass historically occurred in other Gulf of St. Lawrence rivers. Research was recommended to determine the present status of historic striped bass stocks in the lower Gulf of St. Lawrence.

6. The lack of data on striped bass fecundity and on potential egg deposition, as an indicator of potential future abundance, was noted. Research to address these concerns was recommended.
7. No criteria have been developed for deciding the health of the striped bass stock of the Miramichi River and for evaluating the progress towards meeting management plan objectives. It was agreed that such criteria are necessary.

Recommendations

Research:

1. The size of the Miramichi River striped bass stock capable of being supported by the available habitat, at juvenile and adult ages.
2. The assumption of constant catchability of striped bass in traps and the effect of non-compliance on the catch-based estimate of abundance.
3. Striped bass fecundity-size relation and the use of potential egg deposition as an indicator of future year-class size.
4. Criteria for deciding the health of the striped bass stock of the Miramichi River, ergo, target age-composition criteria, allowable population mortality rates, target spawning stock size, critical juvenile abundance index value.
5. Accurate and precise estimates of abundance are required on the initial stages (early part) of the spawning run. This needs to be a priority addressed by tagging bass before the onset of fishing for gaspereau in the northwest Miramichi.

Fisheries Management:

1. Management actions sufficient to attain the objectives of the striped bass management plan should be developed, particularly to enable maximal contribution by the 1991 year-class of striped bass to future spawning runs as the year-class progresses through its life cycle.
2. Management actions taken to protect the striped bass stock of the Miramichi River should apply to the entire lower Gulf of St. Lawrence region.

Fisheries Management Advice

1. Regulations should be developed and enacted to ensure maximal contribution by the 1991 year-class of Miramichi River striped bass to future spawning runs and to reduce by-catch of juvenile and adult striped bass in commercial fisheries for other species. Such regulations should apply throughout the lower Gulf of St. Lawrence. Existing regulations on the minimum retention size of by-caught striped bass should be enforced. On the longer term, measures to protect the striped bass stock should be maintained and enforced so that the restoration objectives of the management plan are met.

5.0 American Smelt

5.1 Miramichi Smelt

Rapporteur: Gerald Chaput

Working Paper Title: **Bycatch of commercial and recreational fishes in the autumn 'open water' smelt fishery on the Miramichi River**

Author(s): Rod Bradford, Gérald Chaput, T. Hurlbut and R. Morin

Referees: Lewis Flagg
Andrea Locke

Introduction

The Miramichi River estuary smelt fishery is the largest in eastern Canada. Because the fishing gear is non-selective, there is interception of species of recreational and commercial value. In the openwater fishery (fall), three species are of particular concern: striped bass, white hake and winter flounder. The purposes of the 1995 study were: 1) to estimate the magnitude of the bycatch in absolute and relative terms, 2) to document size composition, and 3) to assess proposed remedial actions to reduce the bycatch.

Concerns

Referees:

1. The document does not address the winter fishery, therefore it would be helpful to indicate that there are fewer bycatch concerns in this fishery if that is the case.
2. The study did not assess the entire openwater fishery and it would be important to put in context the proportion of the geographical range of the fishery monitored in this study.
3. The estimates of bycatch do not necessarily correspond to mortalities. In fact, released fish could be subsequently captured again.
4. It is not clear whether tomcod are a targeted species or a bycatch species which can be marketed. Details regarding the regulations for this species would clarify its status.
   Winter flounder are a minor proportion of the bycatch. It is of concern because it is a managed species in the southern Gulf of St. Lawrence.
5. Absence of significant changes in catch-per-unit-effort through the season suggests that changes in timing of this fishery would not reduce bycatch. The presentation of this information needs modification for clarity.
6. Without knowing the bycatch mortality rate and the exploitation rate, no conclusions can be drawn on the impacts of the magnitude of the bycatch on the other species of concern.

Recommendations

1. The mortality rate on fish which are culled from the catches should be estimated. Without this information, it is not possible to estimate the impact on subsequent recruitment.

Fisheries Management Advice

1. The magnitude of the bycatch varies among years in terms of the quantity and size groups of the different species intercepted. The effect of the magnitude of the bycatch on subsequent recruitment cannot be determined because the mortality rate and overall exploitation rate have not been estimated. The objective is to minimize the bycatch quantities of non-targeted species. Delaying the season is not expected to reduce the magnitude of the bycatch. One option may be to re-target the openwater fishery to larger tomcod. Larger mesh nets could then be used which would reduce the bycatch of juvenile bass, hake and tomcod.

6.0 ATLANTIC SILVERSIDE

6.1 Prince Edward Island Silversides

Rapporteur: Dick Cutting

Working Paper Title: An update on the Atlantic silverside fishery of Prince Edward Island, 1995

Author(s): David Cairns and the Watershed Improvement Recreational Fisheries Development Program, PEI Department of Environmental Resources

Referees: Rod Bradford
Brian Jessop

Introduction

1. The Atlantic silverside is a small schooling fish that occupies estuarial and near-shore marine waters from Florida to the southern Gulf of St. Lawrence. This short-lived species supports a small autumn fishery in Prince Edward Island (most of the North American fishing) whose intensity is influenced by the strength of the foreign markets which currently seem to be angling bait or food for zoo animals especially tropical birds.

Concerns

Referees:

1. The first referee noted some comparable values of the silversides fishery and the smelt fishery, but the $10,000 cost of a silversides trap changes the economic picture.
2. The need exists to obtain fishery catches (and ultimately production) from the different fishing areas, information which is available. More information is required on the population structures of the various fishing areas. Availability of CPUE data would provide indication of overfishing if that is an issue.
3. The second referee noted the lack of a criterion for indicating overfishing. It is uncertain whether coastal movement of fish is occurring or whether stocks in separate fishing areas are localized. Age-length data by year are needed to show inter-year variability. More information on by-catch disposition and impacts on those other stocks would provide a better means of evaluating the silverside fishery.
4. The "overhang" on licenses created by the new issuals in 1994 should be reduced until stock information shows that exploitation at the high licensed rate, relative to the long-term mean effort, will not be harmful.

Others:

1. Other comments received included: examination of the 1994 catch in storage would give opportunity to obtain biological characteristics from another year; examination of parasitism rates in different areas my be useful to see if many separate stocks exist; monitoring of the sex determination by environmental factors could be useful; fishing locations should be restricted to licensed locations to lessen chance of opportunistic

exploitation; and monitoring stock condition by means of index minnow traps may be effective.

Recommendations

1. Implementation of a logbook system to obtain CPUE and other information is needed.
2. Collection of age-length samples would be useful (including assessment of the 1994 frozen material).

Fisheries Management Advice

1. Freeze nets and licenses at the present level until more information is available, unless the final 1995 landings show a level below the long-term mean which may be the result of the increased fishing and high landings in 1994.

7.0 AMERICAN EEL

7.1 Adult Eel Fisheries within Scotia-Fundy Area

Rapporteur: Kevin Davidson

Working Paper Title: **The status of American eels (*Anguilla rostrata*) in Scotia-Fundy Region as indicated by catch and license statistics**

Author(s): Brian Jessop

Referees: Lewis Flagg
David Cairns

Introduction

Commercial landings of American eels in the Maritimes peaked in 1971 and have since fluctuated between 300 and 500t. Catches in the Scotia-Fundy area have increased but catches in New Brunswick, Prince Edward Island and Nova Scotia rivers emptying into the Gulf of St. Lawrence have decreased. The number of commercial licenses increased threefold and gear units increased by five to seven times between 1985 and 1993 when a freeze was imposed on issuing licenses.

Concerns

Referees:

1. Data currently captured through DFO Statistics and Protection branches is of limited use in providing meaningful biological advice on the implications of management decisions on the conservation of this species. Other data gathering techniques such as the development of a network of "index" fishers and processors should be explored.
2. Mortality of downstream-migrating silver eels at hydroelectric generating facilities may be very high (up to 100%) and can be ameliorated by changing plant operating patterns to decrease turbine use and increase spills at night during migration periods.

Others:

1. There was a general consensus and concern that current knowledge of the biology of this species, particularly its recruitment patterns, and freshwater growth and mortality currently negate the establishment of conservation targets and limit the provision of sound scientific advice on the management of eel fisheries.

Recommendations

Research:

1. A regional committee should be developed to define both short-and long-term objectives and requirements for eel research and define the most expedient ways to meet these objectives. Priorities suggested for this committee include the identification/establishment of index rivers for monitoring elver recruitment and an estimate of the equivalency of elvers to silver eels.

2. There is a need to define an international management strategy for American eels and identify the data needed to implement this strategy.

Fisheries Management Advice

1. There is a strong concern that scientific information on eel biology and the status of North American eel populations limit the provision of biological management advice. Given this concern, and decreases in commercial catches in some areas, increases in exploitation of this species should not be supported.

7.0 AMERICAN EEL

7.2 Elver Fisheries within the Maritime Provinces

Rapporteur: Andrea Locke

Working Paper Title: Review of the American eel elver fisheries in Scotia-Fundy area.

Author(s): Brian Jessop

Referees: Lewis Flagg
Dick Cutting
Martin Castonguay (provided written comments)

Introduction

The fishery for American eel (*Anguilla rostrata*) elvers in Scotia-Fundy area currently supports seven experimental licenses in the lower Bay of Fundy and south and eastern shores of Nova Scotia. The fishery operates in April-June with highest catches in May. The current value of the catch is $1.5 to 2 million.

Concerns

Referees:

1. Additional information re gear is needed as background.
2. Document is deficient in recommendations and management advice.
3. Are there any studies to support our geographic approach to management, i.e., do adult eels remain in the same rivers which they ascend as elvers? [yes].
4. Need a stronger case for the efficiency of harvesting elvers vs. adults; argument based on growth curve may not be adequate - [economic value is the key, elver fishery is much more valuable per kg than eels - market value of elvers is likely quite volatile compared to the eel market, it is an international market with most sales to Asia].
5. Licensing and quotas; what is the technical difference between experimental and regular licenses? [a regular license, once issued, is available in perpetuity - experimental license has no guarantee of renewal and has additional restrictions; this is a management tool to retain flexibility - at some point these experimental licenses will likely be regularized].
6. What was the criterion for increasing quotas of some fishers in certain years? [no data available to oppose this].
7. Note that there was also no data to support increase of quotas.
8. What should be the cap, given that the tendency is to overexploit resources? [the cap is the quota - an arbitrary compromise value, which seems to be achievable, but which can provide a good return to an elver fisher; we don't know whether this quota can be met each year in each area, not enough info for this yet; is it sustainable? does it affect spawning stock of eels? panmictic nature of spawning stock complicates the answer - not certain if there will be any impact on (1) overall spawning in N. Atl., (2) eel stock in those rivers where there is an elver fishery].
9. Sounds like these quotas are set up from an economic not a biological point of view [an elver management plan is being developed].

10. Elver fishery appears to have had an impact on adult eels in Maine - catches of adult eels have decreased by over 75% in the most active elver fishery areas, especially in eastern Maine.
11. Efficiency of catching elvers on small rivers in Maine is proportionally much higher than on large rivers - on some streams with very heavy fishing effort, much higher CPUE - potential for reducing adult eel populations - fishery in Maine is driven entirely by economics, same people are involved in both adult eel and elver fisheries, not by conservation issues - fishers are pushing for elver fisheries.
12. Concerns re impact on adult population likely greater in Quebec where returns are in greater decline than in Maritimes where populations apparently in reasonably good shape - need a continental-wide management plan [there will be initial meetings this spring for a U.S. Management plan, Atl. State Marine Fisheries Commission).
13. Silver eel fishery may be the most biologically indefensible harvest practice with regards to its effect on recruitment.
14. Can one determine what the comparable elver fishery would be in order to have the same impact on the stock as the adult eel fishery - how many elvers required to get an adult eel?
15. The importance of eels and elvers should be considered from a point of view other than purely human considerations - what is their ecological niche? - benefits to estuarine and freshwater fisheries? - impacts of elver removals? - importance of eels as very important food item for bald eagles, for example - they do have value outside of strictly human use - this must be considered in resource management.

Others:

1. Need information on total allocations/year in Table 1.
2. What is drainage area/license, is license allocation scaled by drainage basin area of each geographic area? - [no, this has not been done] - this might serve as an indication of potential production - scale the quota on the basis of the drainage area that is being fished - what about mean discharge? - note that this was asked last year [no basis for quantifiable relationship between drainage area, discharge, etc. and elver quantities arriving] - it would be nice to see these relationships or lack thereof; why not consider this as a starting point?
3. What would be the effect of temperature as a determinant of sex, with respect to a management plan [not important for Maritimes, since we have similar temperatures throughout].
4. Will limitation to 7 licenses continue? In Maine, licenses spread among 1800 people (note that in Maine entry to the fishery is open, in our region entry to the fishery is limited].
5. Maybe should focus on providing licenses for areas where there are obstructions and elvers cannot access rearing areas - to minimize impacts on recruitment.
6. Given that all information identifying individual fishers must be removed from the document under privacy laws, what will remain in a sanitized document, and won't this continue to be a problem with this small fishery? - [yes, this will continue to be a problem].

Recommendations

Research:

1. Determine mortality rates of elvers to market size (yellow or silver) eels.
2. Develop a general formula to determine what removals an area is capable of handling.

3. Determine exploitation rate of elvers by dip net.
4. Batch-dye and release to determine patterns of distribution and rate of movement through river system, verify ages, and examine elver exploitation rates.

Fisheries Management:

1. A starting point for a way to allocate experimental quotas is required; the suggested approach is to describe the drainage areas associated with each license and consider scaling the quotas by area.

Fisheries Management Advice

1. An international management plan for eel conservation should be promoted and supported..
2. Given that we do not know the impact of this additional fishery on eel populations, management should proceed cautiously. We cannot look at elvers outside of the context of the big picture, including adult eel conservation.

PART II CONSULTATIONS

1. 0 INTRODUCTION

This section of the Report contains the written records of the client consultation meetings held prior to the Peer Review meeting. The purposes of these consultations were to provide a preliminary status report on the stocks to clients and other interested parties, to gather any additional information and insights that they might contribute, and to seek suggestions on how to improve the assessment in the future. Some of these consultations were conducted as science only workshops while others were carried out under broader agendas usually dealing with a wider range of fisheries management aspects. Although there were inconsistencies in both meeting format and written record among the various consultations held, there was general consistency in the coverage of science matters.

2.0 ATLANTIC SALMON

2.1 Saint John and Southern New Brunswick (SFA 23)

Keddy's Motor Inn
Fredericton, N.B.
January 4, 1996

Formal consultations re: status of stocks in 1994, pre-season forecasts for 1995 and, in particular , management practices and scenarios above Mactaquac, without the prospect of salmon development above Grand Falls, were conducted in a 'Science Review' at the Florenceville Motel on Sat. June 3, 1995. Clients represented both Canadian and US (Aroostook River and upper Saint John River) interests. Minutes were distributed and are on file in Halifax.

Formal consultations on prospects for 1995 and in-season management measures were discussed at a full meeting of the Salmon Management Advisory Committee (ZMAC 23), [press in attendance] April 21 in Fredericton. A meeting/teleconference between chiefs or their representatives of First Nations of the Saint John River Valley to discuss in-season stock status and the utilization of surplus 1SW fish took place on Aug 9 at Woodstock First Nation. A second meeting of ZMAC 23 Aug 29 in Fredericton, reviewed inseason status of salmon, extent of the surplus 1SW fish, and plans by First Peoples to deal with surplus 1SW salmon and possibly open the door to a hook-and-release recreational fishery. Minutes of all ZMAC 23 meetings are available from the Secretary, Conservation and Protection Branch, DFO, P.O. Box 277, Fredericton, N.B. E3B 4Y9.

'Consultations' as prescribed within a recent Science Branch mandate were included in the agenda of a third ZMAC 23 held Jan 4, 1996, in Fredericton. Attendees included:

Phil Atwin	Kingsclear FN	J.-C. Thibodeau	Northwest Salmon Assoc.
Lewis Brooks	St Mary's FN	Alex Bielak	NBDNRE, Fredericton
Frank Palmater	NB Aboriginal Peoples Council	Doug Clay	National Parks
Ben Macaulay	Kennebecasis Salmon Assoc.	John Mallery	Concerned Citizen
Richard Michaud	AS Federation	Jennifer Cameron	FO, Fredericton (Rec. Sec.)
Stuart Shaw	Central Branch, SJRSA	Greg Stevens	DFO, Halifax
Carl Urquhart	Fredericton Branch, SJRSA	Jack Davis	DFO, Fredericton
John Kearney	Fundy N. Fisherman's Assoc.	Rex Hunter	DFO, St. Andrews, (Chair)
Frank Wilson	NB Wildlife Federation	Ross Jones	DFO, Moncton
Jim Gillespie	NB Salmon Council	Larry Marshall	DFO, Halifax

DFO reviewed the status in 1995 of salmon stocks in the Saint John River above Mactaquac, the Nashwaak, Magaguadavic and St. Croix rivers. The presentation focused on data for (1) target conservation requirements, particularly those above and below Mactaquac, (2) counts

of adults and background information to each of the assessments, (3) the need to adjust counts of externally classified hatchery and wild fish on the basis of scale reading and, (4) the availability of juvenile densities from electroseining and their potential use in ascertaining the past status of stocks in tributaries for which there are no assessments of adult salmon. Estimates of spawning escapement and egg deposition were shown to again be less than 50% of requirements in each of the four assessments; 20+ year low discharges and associated warm summer water temperatures on the Saint John River were not believed to have adversely affected returning adults or the estimates of their numbers returning.

Preseason and inseason forecasting of adult returns was reviewed and, despite the absence of statistically strong forecast models, were no worse than 20% of actual returns. In-season forecasts of end-of-season counts at Mactaquac were also shown to be, at worst (July 14), 20% of the final count. Uncertainties in forecasting adult returns in 1996, as in 1995, were reviewed and it was suggested that returns of 1SW and MSW salmon would in 1996 equal or perhaps slightly exceed those of 1995. Full Minutes of the meeting can be obtained from the Secretary at the above address.

Client input ranged beyond specifics of spawning requirements, stock status and forecasts to the larger issues of (1) hatchery divestiture, (2) the pros and cons of current/past stocking practices in maintaining/building stocks, (3) failure of DFO to promote adequate upstream/downstream passage, (4) need for "free-swim" above Mactaquac to encourage integrity of distinct stock components, (5) the need for a better understanding of the causes of low marine survival, (6) strategies to allow fishing for species other than salmon in the event of a continued closure of the recreational fishery for salmon and, (7) concern over an alleged change in the size of the openings in the trash racks which may or may impede the passage of salmon through the turbines. Comments fitting the prescribed headings and relevant to the assessment process are as follows:

Fisheries - (essentially there were none)

Target - There was a concern that the Saint John could not be rebuilt to historic levels if targets were not elevated to better utilize existing and unutilized juvenile rearing areas above Mactaquac.

Data - The reliability and consistency of adult count data were raised. It was pointed out that count data at facilities in rivers reflect what is left after most fisheries and that increased counts over the last 25+ years can frequently be attributed to reductions in exploitation. NBDNRE presented a series of estimated escapements relative to targets for a 11.75-km stretch of the Hammond River (<10% of the total production area; escapement exceeded target in most years since 1976.) It was mentioned that these data would be evaluated by DFO relative to wild adult returns to Mactaquac and juvenile densities above and below Mactaquac.

Status - Salmon in rivers of SFA 23 have been below target for many years. Discussion ensued on broader issues (see above) of similarity/differences with other under-escaped Atlantic coast rivers.

Prospects - No significant discussion.

Other - It was suggested that more emphasis should be placed on the assessment of stocks below Mactaquac, that more insight should be acquired on the impact of marine conditions on the current low status of salmon stocks, and that DNA microsatellite markers and their variation (extracted from recent and archived scale material) be considered to investigate the genetic impact of mitigative stocking on Saint John River salmon.

2.0 ATLANTIC SALMON

2.2 Inner Bay of Fundy Status (SFA 22)

Zone 22 Salmon Management Advisory Committee
Best Western Glengarry
Truro, NS
December 18, 1995

1. Introduction

The meeting commenced at about 10:30 am. Because the usual chairman, Terry Matheson, was delayed, Greg Stevens acted as chairman and secretary. The purpose of the meeting was to provide Science personnel with a forum to consult with stakeholders prior to the upcoming peer review of the 1995 stock assessments. This new Regional Assessment Process (RAP) gives stakeholders a preview of the stock status in their respective Zones and provides them an opportunity to provide input, ask questions and make recommendations so that Science programs can better respond to client needs.

Carl Purcell asked that the Minutes record that there were no Native representatives at the meeting. Given the serious state of the stocks in Zone 22 and the co-management approach adopted for salmon management since 1990, there needs to be a commitment by Native people to attend these meetings: otherwise, they are really non-meetings.

2. Science Consultations

Stewiacke and other Inner Bay rivers

Peter Amiro, the DFO biologist for Zone 22, explained that the RAP was new and the information provided today was preliminary and not yet reviewed by other biologists. Nevertheless, Committee members were asked what direction DFO should take in terms of its future assessment work for Zone 22.

A seven (7) page handout was circulated. The first page summarized the scale samples taken from the Stewiacke counting fence in 1995. This was a bad news story. Only 21 of the 49 fish recorded through the counting fence had scale samples taken. Indications are from both scale samples and electrofishing, that the number of maiden grilse was lower than the number of repeat spawners. This is the reverse of what the situation should be in the Stewiacke and other Inner Bay rivers.

In response to a question as to why so few scales samples were taken in 1995, Greg Stevens responded that we will be reviewing the contract for the fence operation with the contractor and, hopefully, holding a Stewiacke River Counting Fence Steering Committee meeting in January.

Given the recent stock status, there have been no fisheries (Native or recreational) for three consecutive years, including 1995. The estimated number of salmon in the Stewiacke River in

1995 was less than in 1994. With this situation, we can expect parr levels to remain low for several years.

If the Inner Bay stock situation continues to erode, a couple of short-term options could be considered in an attempt to ensure that some sort of salmon run can be maintained in Inner Bay rivers: (1) cryo-preservation of sperm from an Inner Bay stock; and (2) introducing a nearby non-Inner Bay stock to a river in the Inner Bay. (One possible example would be to stock Gaspereau River salmon in the Parrsboro River. This would re-introduce a run to the Parrsboro River which no longer has salmon and, at the same time, preserve the uniqueness of the Gaspereau River stock which is in some jeopardy from lost habitat resulting from hydro development.)

Although the adult salmon counts in the Inner Bay remain at critically low levels, there was a peak count (4000) for smolt in the Little River (tributary to the Stewiacke) in 1994. In 1995, only about 400 smolt were counted before the fence was breached.

At a previous ZMAC meeting a Committee member requested information on hatchery stocking programs on the Stewiacke River. The information was provided in the handout, and explained by Peter Amiro, for the 10 year period from 1985 to 1995. The only evidence of Inner Bay stocks migrating to North Atlantic waters is 3 tag returns of suspicious nature. All other evidence suggests that Inner Bay stocks don't migrate beyond the outer reaches of the Bay of Fundy and Gulf of Maine. One Committee member indicated that he received some anecdotal information that very small salmon (post smolts) were picked up early this summer by herring seiners in the Bay.

Action:

1. At the next ZMAC meeting, committee members asked that information be provided on the origin of aquaculture salmon (about 33%) found in the Stewiacke River in 1995.

2. Committee members also asked for information on what is currently known about the interactions between aquaculture salmon and wild salmon stocks.

3. In a recent Agreement signed between DFO and the Native Council of Nova Scotia, 400 salmon are allocated to Council members from Zone 22. Given that all stocks in Zone 22 are at critically low levels, and there was no fishery for anyone in Zone 22 in 1995, what is the plan for allocation in future years? This question is to be addressed at the next ZMAC meeting.

4. The Cobequid Salmon Association asked if there would be any benefit to funding another count in a nearby Inner Bay river. DFO's suggestion was that an adult count on the Little River may be more beneficial.

Gaspereau River

Peter Amiro asked Committee members for advice on how we should manage the Gaspereau River. For the past 40 years this has been basically a man-made system. What species should we be concentrating on? According to Barry Sabean's current salmon production estimate (for the area from Trout Brook to White Rock), 67 fish are required to meet spawning target. If we were to look at the production area downstream from Lanes Mill, including a

maintenance flow, and the main stem downstream from White Rock we could be looking at a required escapement of 212 fish.

Action:

Committee members specifically asked that DFO calculate the salmon production potential of the Gaspereau River; a) from Lanes Mill downstream to White Rock, b) for Trout River, and, c) downstream from White Rock.

Committee members expressed interest in the proposal to stock some Gaspereau River salmon in the Parrsboro River. They posed two questions. How long would stocking have to be continued and what will be the impact of hatchery divestiture on this proposal. Peter Amiro indicated that we should see success within 5 years if the transplanting is going to be a successful exercise. Until all details of hatchery divestiture are know, it is premature to state the impact on the transplanting proposal.

Attachments

Attendees

Max Spicer	Cumberland Co. River Enhancement Committee
Carl Purcell	Nova Scotia Salmon Association
Tom Kennedy	Outfitter
Scott Cook	Fish Committee, NSWF
Rick Pryor	Cobequid Salmon Association
Mike MacAdam	Atlantic Salmon Federation

Province

Nancy Adams	Nova Scotia Department of Fisheries

Department of Fisheries and Oceans

Greg Stevens	Senior Advisor, Anadromous
Peter Amiro	Biologist (ZMAC 22)
Vincent Smith	Fishery Officer (ENS)
Terry Matheson	Field Supervisor (Digby)

2.0 ATLANTIC SALMON

2.3 South Shore Nova Scotia ((SFA 21)

ZMAC 21 Advisory Committee Meeting
Wandlyn Motor Inn
Bridgewater, N. S.
Tuesday, December 19th, 1995

The Chair, Bob Barnes, opened the meeting at 1000 hours by welcoming the membership who in turn introduced themselves.

A list of ZMAC Advisory Committee Representatives were passed out to all present. (See attached list)

The Chair indicated that the purpose of this meeting was to allow input by the members into the biological assessment process. (See attached memo to all ZMAC members)

Mr. Greg Stevens advised members that a new process is now in place allowing stakeholders input into the biological assessment process and that there would still be a second meeting in the spring to discuss and develop a fishing plan for 1996.

Mr. Peter Amiro gave an overhead presentation which addressed a number of assessment issues which needed to be resolved. (See attached presentation)

A number of problems have been developed by the surveys. Problems with error and classification make it hard to convert into fish. Technique - using counts taken at Morgan's Falls for all assessments. Mr. Amiro also indicated that he would like to talk about what indicators should be used to assess the remainder of Maritime Rivers.

Biological Description

All science information has been based on the collection of fish at Morgan Falls and the determination of egg deposition.

P. Amiro believes that we must allow salmon to be what there are and not what we would hope that they would be, i.e. Would like 80% large salmon but may only be 60%. (Target is very hard to set.)

Target spawning escapement including Newfoundland should be 2.4 eggs per 100 meters. This formula has a number of buffers in the calculation, which if in error, is conservatively based.

The figure 2.4 also suggests that all the water produces at the same rate which is not true for all bodies of water.

Ricker stock-recruitment curves for LaHave River data.

Mr. Amiro explained how this chart works and suggested that we use this same model for assessment. (Chart in handout)

Stock and recruitment above Morgan Falls have not been very good in 1995 with approximately 1000 fish spawning. The angling fishery caught and retained 542 grilse.

Pre-Season Forecast (Grilse and Salmon Forecast)

This is a first and second recruitment model for wild and hatchery fish.

The smolt production and marine survival is not good. We can only use the number of returning grilse for assessment. Hatchery fish can be used as an indicator of survival because we know the numbers that have been introduced into the rivers.

Prior to 1970 there was not significant production above Morgan Falls. Since that time above Morgan Falls has been colonized and 25 years is not a long time.

There are many areas above Morgan Falls impacted by PH, forestry work, etc., so anything we can do to introduce salmon is a plus.

Only smolts from Morgan Falls will be introduced into that area. Even though more studies are needed on intermixing, we still may not be doing all that badly.

If you have a successful project, it should be successful immediately as it should be set up for a maximum of five years and not 20 years. Remember - you cannot predict success.

Morgan Falls Count 1970 - 1995

The chart indicated no fish were present above Morgan Falls prior to 1970. Due to the hatchery program this increased to 4,000 fish in 1988.

This chart also shows a decline in 1991 and a slight increase from 1992 - 1995.

Catch to date (bars) and in-season forecast estimates (dots) with 5th and 95th percentiles of error (lines to Morgan Falls LaHave River in 1995 (handout)

This year a system developed to predict the numbers of fish expected at Morgan Falls. Unfortuneatly the numbers were not as accurate as expected.

Mr. Amiro feels very uncomfortable with the number of fish that may return to Morgan Falls this year.

Returns for 1995 were worse than forecasted as only approximately 1100 fish went through the counter.

A questions was asked if there was a fall run on the LaHave River. This is an extremely complicated question and it is hard to give a reasonable answer as more studies are needed.

Final estimated figures of egg deposition are very low.

How many fish were angled above Morgan Falls?

Approximately 10% of the fish are angled above Morgan Falls. This figure will be recalculated as more information is supplied.

Spawning escapement for this year was 1.458 million eggs but should have been 1.65 million.

Basin-Wide Assessment

Would like to come to an agreement with all parties to survey Wentzell's Lake, Morgan Falls and Indian Falls.

Would like one survey at Wentzell's Lake to include parr, smolt and one for salmon.

Another ZMAC meeting should be set up sometime in March to ensure that associations are given advanced notice of such changes as no season, hook and release, etc., so that anglers can be advised before they buy licenses and tags.

A question and answer period then followed.

The LaHave River Salmon Association solicited suggestions which would enable them to help make a better assessment for 1996.

Sackville River

Would like to have the river scheduled approximately 100 yards above the Lucasville Bridge to the mouth. Angling pressure is starting to increase from early in the morning to late in the evening. This request is not possible in 1996 while the Fisheries Act is being revamped.

The association is hoping for financial assistance to build a footing at the Sackville fence. Suggested that Ken Rodman can be contacted.

Would also like a Habitat Specialist to check culverts at Millwood Drive. The association would also like help for electronic tagging of about 10 fish taken from the fish trap.

The meeting was adjourned at 1240 hours.

Respectfully submitted,

Thomas R. Lantz
Secretary

TRL/csh

2.0 ATLANTIC SALMON

2.4 Eastern Shore, Nova Scotia (SFA 20)

Appendix 1.

Client meetings were attended by Diadromous Fisheries Division staff to deal with specific client issues or general stock assessment matters as follows:

Client group	Date	Purpose
Eastern Shore Wildlife Association	Jan. 12	Liming East and West Rivers; stock status
Sackville Rivers Assiciation	Feb. 14	Fence operations, run timing
Eastern Shore Wildlife Association	Feb. 16 Feb. 18	Finalize stock status update; liming Assisted liming
Musquodoboit River Association	Mar. 7	Special seasons, stock status
Millbrook First Nations	Mar. 8	Fishing plans; projects for 1995
Liscomb River Association	Mar. 15	Trap operation; acid stress situation on river; stock status
Sackville River Association	Mar. 27	Recreation related to the river and fisheries-future potential
St. Mary's River Association	Mar. 28	River specific management
Liscomb River Association	Apr. 7	Future enhancement, operation of trap and liming
Eastern Shore Zone Management Committee Meeting discussion	Apr. 19	Overview of stock status and of management issues for 1995
St. Mary's River Association SMR	May 25	Stock assessment approach and concerns, index pools, etc.
Liscomb River Association	Jun. 5	Trap visit and operation plans, etc.
Eastern Shore Wildlife Association	Jun. 14	Water quality and stock status; fishing plans; NS Power; liming West River

Millbrook First Nations	Jul. 5	East River program
Sackville Rivers Association	Sep. 7	With Minister NSDOF; future programs
Liscomb River Association	Sep. 27	Trap count, water quality, liming benefit/cost
Sackville Rivers Association	Dec. 22	Watershed management plan
Eastern Shore Wildlife Association stock	Jan.11/96	Results of 1995 work; update on status; water quality report

Meetings preparatory to the Peer Review exercise were scheduled for December 20 and January 3. Both meetings were cancelled because of the weather. Consequently, the information to be presented at the meetings was sent to clients who were asked to provide feedback. The list of clients mailed packages is included at the end of the appendix. The comments provided by interested groups are noted below.

Eastern Shore Wildlife Association

Comments:
- No catch and release figures show on the graphs or tables for West River, Sheet Harbour.
- More areas should be electrofished on the West River SH and particularly places like Rocky Brook
- First Nation catches should be published and trap catches
- Additional liming should be done on both the East and West rivers
- Fish should be allowed to free swim above the Barrier Dam on the East River SH to sustain the interests of the anglers
- Consideration should be given to a fall fishery possibly hook and release
- Recommend that broodstock be collected on the West River SH to enhance and sustain the stock on the West
- West River SH should be scheduled fly-fishing only
- Pleased to see the community so involved in liming to sustain stocks

St. Mary's River Association

Comments:
- Scale samples and creel survey results were forwarded for DFO to analyze

- The exploitation rate is probably too high because the water was too high early in the season, for one week during mid-season and too low after mid-July so anglers had low catch rates
- Water run-off in the system is rapid and must be dealt with
- The index pool system should be used for the next two years which will give us a total of 3 for us to effectively monitor or evaluate the system. Can the cooperative recreational fisheries agreement fund us for the next 2 years to evaluate the program.
- The creel survey for the index pool estimated 56 grilse caught.

Distribution list for Client Services Information Packages, Eastern Shore Nova Scotia

Name	Affiliation
Mike O'Brian	Musquodoboit River Association
Mr. Ralph Webber	St. Mary's River Association
Eldon Day	Musquodoboit River Association
Allen MacPherson	Salmon River, Guysborough
Jack Legge/ Rick Draper	Liscomb River Association
Jack MacDonald	Eastern Shore Wildlife Association
Charles Widgery	Musquodoboit River Association
Robin Archibald	St. Mary's River Association
Don MacLean	N.S. Department of Fisheries
Corey Francis	Native Council of Nova Scotia
Alex Denny	Union of Nova Scotia Indians
Don Julian	Confederacy of Mainland MicMacs
Mr. Alex Cope	Millbrook First Nation
Mr. Walter Regan	Sackville Rivers Association (SFA 21)

2.0 ATLANTIC SAMON

2.5 Cape Breton, Nova Scotia (part of SFA 18 and SFA 19)

Cape Breton Sports Fishing Advisory Committee
Study Hall, Coast Guard College
2:00 pm, Dec. 12, 1995

Attendees

Marshall Kaiser	Chairperson
Charlie Dennis	Eskasoni Fish and Wildlife Commission
Cory Francis	Native Council of Nova Scotia, Truro
M.J. Martin	" " " ", Tatamagouche
Lynda Calvert	Fish Unlimited, Margaree Valley
John Hart	Margaree Salmon Association
Edsel Hart	" " "
Harry Vickers	Cape Breton Anglers Association
Stu Vikers	" " " "
John F. Kennedy	Nova Scotia Wildlife Federation, Port Morien
Vernon Boone	Port Morien Wildlife Association
Michael McAdam	Atlantic Salmon Federation, Truro
Don MacLean	Nova Scotia Dept. Fisheries, Pictou
Tim Reynolds	Cape Breton Highlands National Park, Ingonish Bch
Gordon Delaney	" " " " " , Cheticamp
Randy G. Thompson	" " " " " , "
Jennifer Hoffman	" " " " " , "
Clarence Barrett	" " " " " , "
R.C. Thompson	Dept. Fish. & Oceans, Sydney
Warren Parsons	" " " , Antigonish
Leonard Forsyth	" " " , Margaree
Paul LeBlanc	" " " , Margaree/Moncton
Larry Marshall	" " " , Halifax

This special **consultation on the assessment of the status of Atlantic salmon stocks of Cape Breton Island** was called to order at 2:10 pm by Chairman Kaiser. He introduced Larry Marshall, DFO, Science, who outlined the requirement for Science Branch to consult with the public on the available data, the assessment processes, and preliminary findings prior to the actual drafting of assessment documents.

Dr. Marshall invited the contribution of data, observations or concerns from anyone who now, or in the future, had, or would have information that could enhance the knowledge base of the Island's salmon stocks. He acknowledged the important contribution now being made by First Peoples and volunteer citizens to collect data and the cooperation of Membertou First Nation in providing their database for salmon ascending the Sydney River fishway.

The session reviewed available data from Grand, Sydney, Middle, Baddeck, North and Margaree rivers. Tabled data consisted of counts or partial counts of adults on each of the six

rivers, counts of juvenile salmon within sites on the Grand, Middle and Margaree rivers and catches by anglers voluntarily returning stubs from their Nova Scotia Salmon Angling Licence or voluntarily returning logbooks provided to a subset of anglers that fished the Margaree.

Conservation target spawning requirements previously established for each of the six rivers were also tabled. Dr. Marshall mentioned his intention to examine all "targets" for Cape Breton from the perspective of estimated production area. i.e., the denominator in the underlying target requirement of 2.4 eggs/m^2. He proposed that "area" for the Margaree River and Pollett River (a point source of the 2.4 eggs/m^2 target) would be measured in the same manner as other Cape Breton rivers, i.e., remote-measure weighted by gradient and that each would be "scaled" against the Pollett for a derivation of "relative" river requirements. Results should be available in about one year.

The estimation of in-season and/or end-of-season returns for Middle, Baddeck, North and Margaree rivers by mark-and-recapture experiments was discussed at length. Different approaches (and answers) to estimating the run-size at time revealed the difficulties in assuming that either all tagged and or all untagged fish were available to recapture. Evidence of late run-timing and results from tracking of ultrasonic-tagged fish were used to support the choice of the "best" estimate, where there were multiple estimates, or suggest, where there was only one estimate, that the true number may exceed the estimate.

Stock status for each of the six rivers, 1995, was summarily examined by comparing the general estimates of adult returns with adult target spawning requirements. Stocks of three rivers met or exceeded existing requirements, stocks of two rivers *may* have met requirements and the stock of one river met only about half of its requirement.

Forecasting of abundance in 1996 was not examined in detail. Methodology is currently only available for the Margaree; a method for the North River is still under review. Dr. Marshall indicated that he knew of no glaring evidence to suggest that returns in 1996 will vary greatly from those of 1995.

Observations, expressions of concern, recommendations etc., from the floor have been summarized under the following headings.

Catch:

- The decline in rod days shown in the summary of logbook data, 1995, may be the result of declining stocks as well as fewer log book participants.
- There is an inconsistency between fishing regulations and data shown for the Baddeck River (a grilse was reported as having been retained when the fishery was closed to retention).

Data:

- There were reports by Fishery Officers of salmon showing up in coastal streams such as Frenchvale Brook in late Nov.-early Dec.
- It was questioned if Levi's trap (Margaree) could be installed so that the efficiency is consistent from year to year and if one could apply the current year's estimated

efficiencies to past years. (The response indicated that the trap efficiency could be expected to vary annually with river conditions [discharge in particular], experience in setting the net more effectively and, that the estimated number of returns in 1991 [important to the 1996 forecast] unlike that of 1990 [adjusted at the peer review assessments in February, 1995, for forecasting 1995 returns] is, on casual observation, unlikely to be different from most values since 1985.)

Targets:

- There is a continuing concern that conservation target spawning requirements for the Middle and Baddeck rivers, in particular, are over estimated. (Solution proposed in para 4.)

Stock status:

- Assurance was sought that aquaculture fish would be identified as a separate component within the estimates of adult returns to North and Baddeck rivers, in particular, in 1995.

Other:

- A better understanding was sought by the group of the work being done on Atlantic salmon within Cape Breton Highlands National Parks and of the communication between DFO and Parks. Parks staff related these past involvement in operating a fence on the Cheticamp River, collecting harvest data when there was a retention fishery, electroseining of juveniles and in swim-thru counts of adults in the Cheticamp and Clyburne rivers and, on occasion, the North Aspy River. Adult returns to Cheticamp and Clyburne rivers have in the past been in the range of 200-300 and 50-100 fish respectively (only a partial count was conducted on the Clyburne River in 1995). Assessments are not normally published but Park staff have in the past shared their data with and are interested in continuing, and possibly expanding, the dialogue and cooperation with DFO Science.

The session adjourned at about 4:45 pm; no Minutes were retained on a closing "non-agenda" item re: the recently released allocation of harvestable numbers of fish inc., salmon, to First Peoples represented by the Native Council of Nova Scotia.

2.0 ATLANTIC SALMON

2.6 Gulf Mainland Nova Scotia (part of SFA 18)

Place:
December 13, 1995

Attendees

Warren Parsons	Dept. of Fisheries & Oceans, Fisheries & Habitat Mgmt. Br.
Leroy MacEachern	Dept. of Fisheries & Oceans, Fisheries & Habitat Mgmt. Br.
Shane O'Neil	Dept. of Fisheries & Oceans, Science
Denis Haché	Dept. of Fisheries & Oceans, Fisheries & Habitat Mgmt. Br
David Longard	Dept. of Fisheries & Oceans, Science
Jive Logan	
George Taylor	Outdoor Centre, City of Hfx
Bob Boudreau	
Clayton Mills	Pictou Co., River's Association
Don MacLean	Nova Scotia Dept. of Fisheries
Walter Devereaux	
Gary McGrait	Antigonish Rivers Association
Kim Robbins	Antigonish Rivers Association
Terry MacIntyre	Nova Scotia Salmon Association
Peter Gay	Cumb. Co. River Enhancement
Graham MacKenzie	Pictou Co., River's Association
Delbert Smith	Pictou Co., River's Association
Samiel Lloyd	Pictou Co., River's Association
Bob Taylor	Pictou Co., River's Association
Allister Allard	Pictou Co., River's Association
Willie Deyoung	Pictou Co., River's Association
Richard Kellock	Pictou Co., River's Association
Bob Peek	Pictou Co., River's Association
Bob Ferguson	Pictou Co., River's Association
Parker Wong	Pictou Co., River's Association
Robert Christie	PHEPP
Bennie	Pictou Co., River's Association
Bill Cardiff	Pictou Co., River's Association
Dick Pavllen	Pictou Co., River's Association
John William	Student, NS School of Fisheries
Darren Tower	NS Dept. of Fisheries/CCREA
Pierre Sampson	ACAP, Cape Breton
Billy Corbett	Guysborough County Inshore Fisherman Association
Keith Allison	Medway Environmentally Concerned Citizens,
Wayne Samson	Musquodoboit River Association
Bernie Atkins	Shelburne County Marine Industry Comm.
Bob Roberts	Guysborough County Inshore Fisherman Association
Basil Baker	Musquodoboit River Association
Steven Theriault	Project Managers for Community Groups (CARP)

Myrna McQuaid — Avon Waterways Society
Norma Jean Prosper — Pictou Fishery School

Minutes

- A suggestion was made to place an advertisement in the newspaper or use some other means to advertise meeting to reach a broader group.

- There was a question of whether or not juvenile year-classes were looked at. DFO uses a breakdown of year-classes in the electrofishing sites as well as looking at juvenile ages when reading scales from adult salmon.

- It was suggested that DFO should err on the side of caution when making assessments and when setting seasons and bag limits.

- Denis Haché gave a short explanation of the fishway operation at Middle River, Pictou. He also made a few suggestions of fishway operations which will make a more efficient operation under fluctuating head pond levels.

- Bob Ferguson gave a brief description of the Bear Brook habitat restoration project. Their group worked on 14 miles of river placing 81 structures in the stream. They had 14 students, and 2 on the UI top-up program, employed on the project.

- Concern was expressed for fluctuating water flows in rivers and whether or not deforestation of the watershed had an adverse effect on river quality.

- It was suggested that the fishing season should be extended into November during years of low water and upstream migration of salmon is delayed. DFO personnel and anglers expressed concern for successful spawning of salmon after being angled just before or during spawning season.

- Anglers would like more information on the First Nations harvest of salmon and native rights pertaining to fishing.

- There has not been any discussion to date on 1996 First Nations fishing harvest.

- Anglers expressed a great deal of concern regarding poaching of Atlantic salmon. It was suggested that River Watch programs do help, especially with the reduction in resources of the Conservation and Protection Branch of DFO.

2.0 ATLANTIC SALMON

2.7 Prince Edward Island (SFA 17)

Charlottetown, P.E.I.
January 11, 1996

Salmon consultation on Prince Edward Island

The PEI salmon consultative meeting was held on 11 January 1996 in Charlottetown. In attendance were three provincial representatives, 15 representatives of angling groups, and five DFO representatives. The meeting was chaired by Hank Scarth, DFO Area Manager for PEI. Public participation in the meeting was based on the membership of the Public Advisory Committee of the Watershed Improvement/Recreational Fisheries Development Program, which is a federal-provincial cooperative program.

David Cairns presented preliminary assessment data for PEI salmon. There were few comments on the assessment methodology or results. Public representatives voiced support for the installation of a conduit fish fence on the Morell above Indian Bridge to count wild smolts in spring 1996. Opposition was expressed to the operation of a counting fence for adults on the Morell, on the grounds that it might hold up fish from ascending the river.

The allocation of stocked smolts to PEI rivers in spring 1996 was discussed. Some representatives said that more smolts should be stocked into rivers where they have the best chance of returning, particularly the Morell.

Ron Whitehead of DFO-Moncton reviewed the new regulatory system to be set up under the new Fisheries Act. He noted that the new Act will give the Department more flexibility in issuing regulations. He also noted that a new fishing licence, to be required for recreational fishing in tidal waters, is planned for 1996.

Recommendations arising from the previous year's meeting were reviewed. In 1995 the PEI government imposed size limits for trout and banned barbed hooks for salmon angling after 15 September. DFO's legal advice indicated that these regulations were not enforceable. Under the new Fisheries Act DFO would have greater ability to issue such regulations. Representatives reiterated the view that barbless hooks should be mandatory for salmon angling after 15 September.

It was noted that a proposal to permit salmon angling on the Dunk River by lures would never be accepted, because salmon angling is limited to artificial flies by Maritime-wide regulation.

Public representatives wanted the practice of chumming trout to be banned. It was noted that this would be difficult to do because there appears to be no support for such a move at a Maritime-wide level.

It was reported that the last commercial salmon licence on PEI has been bought out.

Several representatives expressed concern about high water temperatures in impoundments and their outflowing waters, and also blockage of fish passage in the fishways of these impoundments. They asked if DFO could use its regulations to require that impoundments be managed in such a way that excessive summer heating is avoided. Hank Scarth will set up a meeting to explore this. Ron Whitehead will research the legal aspects of this issue.

Representatives asked about legal impediments to a terminal salmon fishery below Leard's and Mooney's ponds on the Morell River. This had previously been proposed by the Morell River Management Co-op, which wanted to use it as a fund-raiser. It was noted that the Fishery Act currently bans fishing within 25 yards of a fishway and that this restriction is unlikely to be lifted.

The allocation of salmon to natives was discussed. DFO does not plan to re-negotiate the 400 salmon allocation on the Morell at the present time. Legal advice is that once hatchery or semi-naturally reared fish have been released into a river they become common property, and therefore have the same status as wild fish with respect to native fishing rights.

2.0 ATLANTIC SALMON

2.8 Bouctouche (SFA 16)

Bouctouche Salmon Science Workshop
Band Office, Bouctouche First Nation
0900 - 1200 Hours, Wednesday, 6 December 1995

Attendees:

Bill Sanipass	Chief, Bouctouche First Nation
Marie-Josée Maillet	Southeast Anglers Association
Gérald Chaput	DFO Science, Moncton
Gary Atkinson	DFO Science, Moncton

General comments

A spawning run of Atlantic salmon enters the Bouctouche River during September and October, and is exploited for food by Bouctouche First Nation and for public recreational angling. Information on stock status is required to manage salmon harvest on the Bouctouche, ensuring that adequate spawning escapement occurs on a sustainable basis.

The meeting was convened to present and discuss the results of research efforts and the co-operative salmon stock assessment project carried out on the Bouctouche River in 1995 by DFO, Bouctouche First Nation, and the Southeast Anglers Association. The meeting was less well attended than expected, as Tom Pettigrew from the New Brunswick Department of Natural Resources and Energy, Jean-Claude Babineau from the Southeast Anglers Association, and Rhéal LeBlanc from the Kent County Anglers Association had other commitments and were unable to attend. Consequently, a clear direction for future work did not emerge from the meeting, and it was decided to reconvene at a future date to discuss this.

Gary Atkinson presented the data directly relevant to the co-operative stock assessment effort with Bouctouche First Nation and the Southeast Anglers Association; Marie-Josée Maillet presented the results of electrofishing and by-catch surveys conducted by the angling association.

Fisheries

First Nation

Bouctouche First Nation currently harvests salmon from research trapnets in the Bouctouche River during September and October. In 1995 15 small salmon were removed for food. Allocations to Bouctouche First Nation under the AFS agreement in 1995 were 36 large and 56 small salmon.

Recreational

Recreational angling occurs from the head of tide upstream, principally during the month of October: there is no leased water on the system. There is no accurate estimate of angling catch, but a telephone survey of 27 anglers known to fish the Bouctouche River indicated that at least 8

small salmon were retained and 2 were released: no large salmon were caught and released. It is not known what proportion of all angling the survey represents.

Poaching

Fishery officers (DFO, DNRE) estimate that 6 large and 24 small salmon were taken from estuary smelt traps, and 20 large fish were removed by various means in freshwater. A survey of by-catch in the Bouctouche estuary from gaspareau traps (June), and smelt traps (November), conducted by the Southeast Anglers Association found no incidence of salmon. Poaching is considered to be a serious problem on this river but documentation is poor because apprehensions are infrequent.

Broodstock

Seven large and 8 small salmon were taken for reproductive products and subsequently returned to the river, as an enhancement initiative of the Southeast Anglers Association.

Target

The conservation spawning target for the Bouctouche River is 1.587 million eggs. This is based on an optimum deposition rate of 2.4 eggs per square meter, and the area of wetted habitat as measured by DNRE. Using stock characteristics observed in the current year, the egg target represents 268 large and 189 small salmon.

Data

Mark-Recapture

Blue Carlin tags were attached to all salmon caught and released in two estuary traps which operated from 18 September to 29 October. Tags were recovered at the upper trap, a counting fence which operated upriver from 11 October to 10 November, and from angling captures above the fence. Tagging effort and recaptures may be summarised as follows:

Tags Applied

Location	Large	Small
Marking trap	11	15
Recapture trap	35	22
Total	46	37

Tags Recaptured

	Large		Small	
Location	Recap	Catch	Recap	Catch
Recapture trap	4	39	8	43
Counting fence	3	10	12	27
Angling	0	0	7	10

Total catch for both estuary traps was 46 large and 53 small salmon. Run timing appeared to be several weeks earlier than 1994. The operation of the counting fence was problematical in the high water conditions of 1995 and was only partially operating much of the time. Total catch was only 10 large and 27 small salmon. Although a complete count was not possible, it served as a tag recapture site and was seen as a valuable component of the assessment program and one that should be continued, funds permitting.

Age determination

The 1995 sample has not yet been aged: of known-age fish in 1994, 2+, 3+, and 4+ smolts respectively comprised 62%, 37% and 1% of the sample. Of the multi-sea-winter (MSW) component, 78% were maiden two-sea-winter (2SW) fish and 22% were repeat spawners. Of the total number of repeat spawners, 23% had previously spawned as a one-sea-winter (1SW) fish, or grilse.

Juvenile surveys

Data were presented from three sites which indicated very low densities of all age-classes at all sites. It was generally considered that a great deal more effort was needed and justified to provide an adequate indication of juvenile densities in the Bouctouche system.

Spawner surveys

A survey was attempted from the Forks to the head of tide (2 km), but due to high discoloured water it was not successful. It was generally felt that conditions in the fall are not conducive to meaningful counts.

Status

Methods

Returns were calculated in two ways: 1) from tags placed in the lower estuary trap and recovered in the upper, and 2) from all tags placed at estuary traps and recovered at the counting fence. The most probable population size given R recaptures out of M marks placed in a sampled catch of C was calculated over a range of possible population sizes using a Bayesian estimator. Total returns to the system were obtained by adding known or estimated removals to the marking site; then the corresponding spawning escapement was computed by subtracting total removals from total returns.

Calculated from upper estuary trap recaptures, total large salmon returns were estimated at 114 with a spawning escapement of 81. Small salmon total returns were 107 with a spawning escapement of 52.

Calculated from counting fence recaptures of all tags, total returns of large salmon estimated at 160 with a spawning escapement of 127. Small salmon total returns were 122 with a spawning escapement of 67.

Target met

Assuming that all fish spawned, the two estimates of returns indicate that between 32% and 50% of the conservation target was met for the Bouctouche River in 1995.

Trends

Conservation target egg deposition has not been met on the Bouctouche River for the three years for which the stock has been assessed (1993-95). Deposition in 1995 was at least 11% lower than in 1994.

Ecology

High water for an extended period after mid-October was probably beneficial to spawners, allowing them better access to upriver spawning sites than in 1994 and potentially deterring poaching efforts.

Prospects

At present there is no reliable method of forecasting returns of Atlantic salmon to the Bouctouche River. It may be possible to develop in-season forecasting using run-timing to the trapnets when a sufficient number of years of trapnet operation have accumulated. Given a longer term data set, it may be possible to develop a stock/recruit relationship. Increased returns in 1994 over the previous year seemed to indicate a potential for recovery, but this was not sustained in 1995.

Other

A meeting of all parties concerned with assessment, enhancement and conservation on the Bouctouche River will be held at a later date to discuss further improvements and priorities in future work.

2.0 ATLANTIC SALMON

2.9 Miramichi River (SFA 16)

Science Workshop
Eel Ground First Nations Band Office
Jan. 11, 1996 (9:30 to 16:30, 18:30 to 21:30)..

Appendix 1.

Chairperson:	
Gérald Chaput	DFO, Science, Moncton
Day session:	
Robert Allain	DFO, Tracadie-Sheila
Alex Bielak	DNRE, Fredericton
Michel Biron*	DFO, Science, Moncton
Junior Denny	Eel Ground First Nation, Eel Ground
Bernie Dubee	DNRE, Miramichi
Dave Dunn	DFO, Moncton
Clifford Ginnish*	Eel Ground First Nation, Eel Ground
Mark Hambrook*	DFO, Science, Miramichi SEC
John Hayward	DFO, Science, Miramichi SEC
Bill Hooper	DNRE, Fredericton
Rod Hooper	Correctional Services Canada, Miramichi
Dave Moore*	DFO, Science, Moncton
Wes Myles	Sportfish Advisory Committee, Doaktown
Joe Sheasgreen	DFO, Science, Miramichi SEC
Bill Scott	DFO, Miramichi
Harold Somerville	Burnt Church First Nation, Burnt Church
Weldon Ward	Burnt Church First Nation, Burnt Church
Bruce Whipple	Northumberland Salmon Protection Association, Miramichi
Evening session	
Bernie Duffy	Renous/Dungarvon Rivers Enhancement Miramichi Watershed Management Committee, Renous
Tim Lutzac	DFO, Science, Moncton
Norm Rogers	Northumberland Salmon Protection Association, Miramichi

* attended day and evening sessions.

Workshop objectives were described as follows:

- accounting of harvests
- estimation of returns by priority
  1 - Miramichi River

2 - Northwest and Southwest branches
3 - By season

- estimation of escapement (spawners)
- escapement compared to target
- confirmation of estimates using abundance indices
- prospects - short term (1996) and long-term (beyond 1996)
- management considerations to be included in the assessment
  1 - harvestable surplus
  2 - distribution of harvest by season and branch
  3 - environmental effects on availability
- activities and questions for 1996 and beyond

Points of Discussion

Initial definitions:

Small salmon - salmon less than 63 cm fork length, also referred to as 1SW salmon
Large salmon - salmon >= 63 cm fork length, also referred to as MSW salmon

Early run - fish sampled at the trapnets up to and including Aug. 31
Late run - fish sampled at the trapnets after Aug. 31.

Landings

Two user groups in 1995: First Nation food fisheries and recreational fisheries

Food fishery agreements were signed with Eel Ground First Nation and Red Bank First Nation. A communal license was issued to Burnt Church First Naton. Harvests from Eel Ground and Red Bank are complete. There was a harvest of small salmon from the Southwest Miramichi by Eel Ground First Nation.

Recreational fisheries seasons were affected by river closures - in the Northwest Miramichi, Little Southwest Miramichi, and Renous River. Closures were due to low water, warm temperatures and Big Hole Tract fisheries crisis. Angling catches for 1995 from FISHSYS are expected to be available in mid-February. Crown reserve catches from the Northwest and Little Southwest will be available next week. Preliminary crown reserve data indicated that catch, effort and CPUE were lower in all crown reserve stretches.

The only angling data available were from a creel survey conducted at Quarryville Pool at the mouth of the Renous River. Catches of small salmon in 1995 were one-third the catches estimated for similar time period in 1993. Effort distribution was similar in both years. Based on these data, angling catches in 1995 are expected to be down from previous years.

Southwest Miramichi angling was down in 1995 compared to previous years due to low water and warm water. Miramichi Salmon Museum was unable to maintain its angling camp index because outfitters were reluctant to report catches. In Northwest Miramichi, July fishing was poor but there were large numbers of fish in the south and north branches of the Sevogle in the fall.

Conservation Target

No change in target for the Miramichi from values used in previous years.

Evaluation of habitat areas at Catamaran Brook (DFO) and Bartibog River (DNRE initiative) indicated that the aerial photo measurements for Catamaran underestimated ground surveyed habitat because of the extensive tree cover. Same result for Bartibog River, tributary of the Miramichi Bay. Concern was expressed that the areas for the Miramichi could be underestimated and the target may be too low. If techniques for measuring habitat are different than those used to calculate the 2.4 eggs m^{-2} interim egg deposition target, then 2.4 may no longer be appropriate.

Data

Returns were estimated using mark-and-recapture experiments.

Recaptures from the recreational fishery are used to estimate the emigration rates of tagged fish between the branches. Estimate in 1995 was not as precise because of the smaller number of recaptures than expected, especially in the Northwest Miramichi (result of angling closures).

Returns to the Miramichi were estimated at 32000 large salmon and 52000 small salmon.

Removals

- Angling data for 1995 were not available, the average of the previous five years was used. Large salmon angling removals are calculated as 3% for hook-and-release mortality.

- Seizures by DFO officers were included in the removals. DNRE enforcement activity was not tabled but numerous nets were seized. Concerns are that poaching may be important on some parts of the system and is likely more detrimental on smaller tributaries than on the main branches. Poaching removals are not possible to quantify but juvenile abundance trends indicate that substantial escapement has occurred.

Biological characteristics

- age determinations for 1995 are not available but, based on age-length key from previous years, about 20% of large salmon would have been previous spawners.

- sex ratio: internal sex determinations of food fishery catches of small salmon from Eel Ground and small as well as large salmon from Red Bank. External determinations for fall fish. Early-run fish have a higher proportion of females, both small and large salmon. Trapnet ratios were consistent with barrier pool seining samples.

- fecundity: calculated using mean length and length-fecundity relationship derived from counts of oocytes of unripe ovaries. Preliminary comparisons of hatchery (ripe, stripped eggs) fecundities indicate that unripe oocyte estimates are higher than hatchery-derived values. Verification of the fecundity values used in the derivation of the target is required before a different fecundity relationship is to be used.

Egg depositions:

Miramichi received 178% its conservation of target, Southwest Miramichi received 139%, Northwest Miramichi received 265%. More than 80% of the eggs were contributed by late-run fish which prompted the comment that a late-run fishery was being developed.

Abundance Indices

Barrier fences

Trends in estimated returns in 1995 correspond to returns of large salmon at the Northwest Miramichi barrier and the North Branch of the Southwest Miramichi (Juniper) barriers. Dungarvon barrier counts were lowest since 1984. Small salmon counts were also consistent with mark-and-recapture estimates.

Juvenile surveys

Historical sites from the Northwest Miramichi sampled in the 1950's and 1960's (Fisheries Research Board) were presented. These sites showed the same trend as the index sites: fry and parr abundances were low in the 1970's and increased in the late 1980's. Southwest Miramichi sites also showed improvement from the 1970's and early 1980's. Fry and parr densities in 1995 were among the highest or the highest in the time series. A verification of the possible effects of low water conditions in 1995 on the estimated densities is required - could low water in 1995 have resulted in crowding of salmon such that high densities are mis-interpreted as high abundance?

Ecological considerations

Average monthly discharge conditions in the Southwest Miramichi in June to October were deficient (below the 25th percentile). Discharge in November was excessive. The Southwest Miramichi grouping station is the only remaining active station for the watershed.

Water temperatures were high in July and August. Cooler temperatures were registered at the headwater barriers than at the estuary trapnets. Warmest temperatures were recorded in the Little Southwest Miramichi (above Catamaran Brook) where a maximum of 30C was recorded on Aug. 11. Temperature range was also the greatest on the Little Southwest Miramichi.

Low water levels had a dramatic effect on the movements of salmon through the Southwest Miramichi (Juniper) barrier; 90% of the small salmon and 95% of the large salmon moved through the fence during Oct. 10 to 30. In other years, 10% to 80% of the fish have been counted by Sept. 15.

Low water levels held back fish in the estuary. In previous years, tags recovered at the Juniper barrier were exclusively from fish tagged before Sept. In 1995, almost half of the tags recovered at the Juniper barrier were of fish tagged in the estuary during September and October.

Juvenile salmon densities around the headwater barrier site in the Northwest Miramichi were very high, PHS values of 55 to 87. Juvenile surveys throughout Northwest and Southwest Miramichi indicated that spawning had occurred throughout the watershed in 1994.

Prospects

Short-term

Large salmon returns to the Miramichi are predicted from small salmon returns the year before. Predicted return of large salmon to the Miramichi River in 1996, based on a return of 52000 small salmon in 1995, is in the order of 30000 fish. Smolt counts at Catamaran Brook in 1995 were similar to 1994, suggesting a similar return of small salmon in 1996 to that of 1995.

Long-term

Juvenile densities have been increasing since 1984. Returns of large salmon in 1992 to 1995 are the result of fry present in 1987 to 1991 (assume 2-and 3-year smolt production). Densities have not changed since 1985. We expect returns of large salmon to be at least as high as those observed in 1992 to 1995.

Enhancement Initiatives

Stocking in 1995 by life stage and tributary was summarized. 2-year smolt stocking was only half the anticipated amount because BKD-infected Northwest Miramichi smolts from semi-natural ponds were destroyed. Broodstock in 1995 were collected from the Little Southwest, Dungarvon and smaller quantities from Southwest and Northwest to support the satellite rearing program.

Adipose-clipped salmon were counted at estuary trapnets, Renous River partial fence, and at the Little River fence in late October. The Little River fence was installed to monitor the returns of adipose-clipped cage-reared smolts released in 1994. Generally, adipose-clipped grilse represented less than 1% of total fish sampled; Renous River partial fence had 3% adipose-clipped grilse returning before September.

Management Considerations

There were concerns about the state of the stock of the Little Southwest Miramichi. Although a surplus to conservation for the Miramichi is expected in 1996, how can we reduce the impact on the Little Southwest Miramichi? Based on broodstock seining efforts in 1995, large salmon were not abundant in the upper stretches of the Little Southwest, even into October. In 1994, juvenile densities were lower than in the Northwest. More extensive juvenile surveys in the Little Southwest could help define its status relative to the Northwest Miramichi, a task which some user groups could undertake.

Allocations of surpluses should take into account the relative state of the stocks on a finer scale than presently used: suggested Little Southwest, Northwest, Renous/Dungarvon, Southwest.

FISHSYS provides the only estimate of angling catch for the Miramichi. The data are not available for the assessment and there is an indication that this survey may take place every two years if at all. Stock status can only be determined if the losses to spawning are known. It becomes more difficult to obtain harvest data from First Nations if there is no effort to quantify the removals from the largest user group (recreational fishery).

Research recommendations and initiatives

Proposal has been submitted by DFO Science to estimate the smolt production from the Southwest Miramichi. A portion of the available resources would have to be reallocated to the smolt program - juvenile surveys was identified as the program which would be affected.

Habitat surveying was suggested as a more pressing initiative - especially in view of the findings from Catamaran and Bartibog. Habitat surveys will not provide information which will allow the development of a conservation target specific to the Miramichi. Estimates of freshwater production (smolts) and subsequent adult returns are the only way of developing a river-specific target.

A report looking at the implications to angling potential as a result of closures due to warm water is being prepared (A. Bielak, DNRE). It will be reviewed in March.

FISHSYS statistical review is nearing finalization. Report addresses the gain to precision by surveying 15% versus 30% of angling license holders.

Other initiatives of potential interest

Habitat database compatible with GIS format is being developed for the Miramichi.

Habitat surveys of Catamaran Brook and Bartibog River have been completed and data are being structured to fit the GIS format. Surveys should be described in reports from the client groups supported by Cooperative Agreement on Recreational Fisheries.

Habitat surveys of headwaters of the North and South branches of the Southwest Miramichi have been completed. Same requirement for reporting.

2.0 ATLANTIC SALMON

2.10 Nepisiguit (SFA 15))

Nepisiguit River Fish Management Committee Meeting
DNRE Offices, Bathurst
Dec. 6, 1995.

Chair: R. Baker NSA

Attendees:

A. Locke	DFO
F. Mowbray	DFO
A. Madden	DNRE
E. LeBlanc	DNRE
B. Paul Sr.	PFN
B. Paul Jr.	PFN
L. Arseneau	NTPA
W. Donald	Repap Inc.
D. Mason	Stone Container Inc.
F. Chiasson	DNRE
A. Bielak	DNRE
W. Hooper	DNRE
D. Surette	EPAP

- this consultation was carried out as part of the regular meeting of the management committee: highlights of reports relevant to salmon in the Nepisiguit are taken from minutes of the meeting

NSA - R. Baker

- two thirds of incubating eggs at Grand Falls were lost due to a water stoppage
- stocked 105,000 salmon fry in Nepisiguit R.
- very low angling pressure during summer due to very low and warm water
- did juvenile salmon population estimates at several sites on 8 streams
- counted/estimated 4,226 salmon redds containing 10-12 million eggs in Nepis. R.
- estimated total return to the river was 1,218 grilse and 2,189 salmon
- estimated angling catch was 450 grilse and 300 salmon
- counted approx. 40 mergansers downstream from Grand Falls, based on counts on several days
- identified obstructions in all streams electrofished
- NSA will participate in Fish N.B. Day (June 8 or 9 1996), angler diary, and River Watch programs

Pabineau First Nation - B. Paul Jr.

- fence installed July 12 due to late receipt of funding and the run timing was later than normal due to low warm water all summer
- most fish were counted through fence in Sept./Oct.
- counting was curtailed Oct. 19 due to fish releasing eggs/sperm when handled
- large numbers of salmon reported ascending after Oct. 19

- less than 200 of the agreed-upon grilse quota of 500 was harvested, none of which occurred at counting fence
- the conservation ethic is continually being preached by Band leaders, and employment in salmon conservation projects takes pressure off salmon exploitation by First Nation members
- band has implemented a Fish Guardian program

DFO - A. Locke

- DFO/PFN tagged 148 grilse and 37 salmon at 2 estuarial trap nets with 6 tags being recovered at counting fence or by anglers
- not enough tags were recovered for mark-recapture estimate
- run timing at traps and fence was similar - therefore traps were representative for timing
- one fish was at large for 75 days after release from traps before reaching the fence - but fish tagged late in the season moved rapidly from traps to fence
- grilse catches have declined over past 3 years
- spawning escapement estimated at 500-600 grilse and 900 large salmon, producing 7 million eggs or 70% of the conservation requirement at 2.4 eggs/m^2

Water flow - Hydro Dam

- concerns expressed re low flows through dam at Grand Falls (Stone Consolidated) - significant streamside incubation losses in 1995, possible effects on salmon migration
- D. Mason will follow up on safeguards re incubation box flows - also, look into dam's operating regime to assess options available during low flow periods to maintain sufficient water levels for migration

Broodstock collection and stocking - L. Anderson

- spawned 85 females and 80 males, produced 650,659 eggs
- total fish collected were 86 females, 82 males of which 9 were grilse, survival rate was 98.2%
- distributions were:
  350,000 eyed eggs to incubation boxes
  78,801 late run 0+ parr
  12,105 early run 0+ parr (adipose clipped)
  6,000 0+ parr stocked in Tetagouche R. (adipose clipped)
- stocks on hand:
  24,000 0+ parr

Enforcement - F. Chiasson

- apparently DNRE did not communicate installation of the trapnets to its enforcement officers, causing enforcement confusion for DNRE for the second year in a row, however, this was an internal problem for DNRE since DFO did send the research permit and F. Mowbray personally visited the Bathurst DNRE office to ensure that the supervising enforcement officer had received a copy

2.0 ATLANTIC SALMON

2.11 Restigouche River (SFA 15)

Restigouche Fishery Science Working Group
New Richmond, PQ,
0830-1230 hrs, Wednesday, January 10 1996.

Chair: Andrea Locke DFO

Attendees:

Pierre D'Amours	Listuguj FN
Paul Cameron	DFO
Fred Whoriskey	ASF
Alan Madden	NB DNRE
Richard Simonson	Eel River Bar FN
Jake Caplin	Eel River Bar FN
Gilles Landry	PQ MEF
Richard Firth	Causapscal, PQ

1. General comments

- the main purpose of the meeting was to compare data and discuss this year's stock assessment of Restigouche salmon
- these minutes will summarize the main points of discussion but for detailed results the assessment document currently in preparation (DFO Atlantic Fisheries Research Document) should be consulted

2. Fisheries

- total angling catch was down from last year, especially poor for grilse
- this decline was probably due to low water, drought conditions
- angling effort was not down much from previous years, but CPUE was poor
- Listuguj First Nation did not have any data on their catches
- Eel River Bar First Nation catches were less than half of last year's catches - effort may be down slightly because of the popularity of the lobster fishery - Richard Simonson suggested that the rivers be closed to everyone if the stock is in that bad condition

3. Conservation Target

- the CAFSAC target of 2.4 eggs/m2 will continue to be used here
- as discussed last year, the DNRE estimate of rearing area is higher than the DFO estimate.
- no conclusion was reached as to whether the target should be increased to reflect the DNRE habitat estimate

4. Data

Stocking (Cameron)

- eggs of Little Main and Kedgwick origin were provided to incubation boxes on the same systems
- fry from the same origin were provided to satellite rearing sites on the Little Main, Kedgwick, Main and Upsalquitch
- fall fingerlings and 1+ parr from Kedgwick were stocked to Kedgwick
- broodstock were collected from Little Main, Kedgwick and Upsalquitch

Satellite-reared fish (Whoriskey)

- satellite reared fish in the Upsalquitch were late getting into gravel compared to wild fish
- since wild fish were already in gravel when reared fish were stocked, they did not have any role models for the proper behaviour
- they go into gravel at approx 9 C
- reared fish were 35% fatter at stocking time and 1 year later were smaller than their wild counterparts - this fat probably provides a buffer while they learn to feed
- only 6 of 4000 satellite-reared fish marked at stocking time with visual implant tags were recovered 1 year later - but only 2 of 1000 wild control group were recovered - possible that fish moved extensively due to drought

Trapnets (Locke, D'Amours)

- Morrissey Rock trapnet catches were higher for large salmon but very poor for grilse (down by 60%)
- catches at Adams Shore/Smith Island continued through July and August after Morrissey Rock stopped catching fish - probably this is because the north channel continued to have water, whereas the south channel was very shallow
- recaptures of tagged fish by angling were very poor (17 recaptures of tagged grilse)
- recording of tagged fish at Upsalquitch fence was poor and these data cannot be used in the assessment

Counting fences (Madden, Firth)

- Upsalquitch: large salmon counts were up by 28% compared to 1994 but grilse were down by 38% - the run was late, about 39% entered after mid-September compared to 17% in a "normal" year
- Causapscal: large salmon counts were up, no change in grilse - but the counting fence does not hold grilse
- changes were made to the barrier at the upstream end of the Causapscal holding pool and the Patapedia barrier - should be possible to get these into place early next year and minimize washouts

Diver counts (D'Amours)
- covered exactly same area as last year, plus Milnekeg - about 75% of system
- some major differences from last year, e.g., Junction Pool had >1000 fish compared to 300 in 1994
- decrease of 14% in grilse, increase of 35% in large salmon counts
- suggestion to improve counts for next year - add a second diving team and start on Sept. 1 - some counts had to be done from canoe during spawning this year since couldn't finish the diver counts in time

Canoe counts (Madden)
- covers 80-85% of system
- large salmon counts similar to diver method, grilse about 50% lower
- F. Whoriskey noted that counts by tributary diverged by up to 1000 fish.

Juvenile surveys (Locke)
- similar to past few years

5. Status

Estimates used at the meeting: (*** note that some of these estimates will change based on data provided at the meeting - the corrected numbers will be reported in the stock assessment document!)

	Large spawners	Small spawners
Conservation Target (71.4 million eggs):	12,200	2,600
Mark-recapture estimate	19,340	10,183
95% confidence limits	(8,139-38,753)	(3,733-21,363)
Angling exploitation estimate		
ER=0.3	8,149	3,676
ER=0.5	4,426	1,557
Canoe-based spawner counts	7,980	2,653
Diver spawner counts	7,720	3,478

- as in 1994, the mark-recapture estimates are much higher than those obtained using other methods
- grilse spawning escapement is adequate by all methods except the angling-based estimate with exploitation rate of 0.5 - however based on the observed spawners and the poor angling success here and in Gaspe rivers where ER was in the range 0.3 to 0.35, it is highly unlikely that ER was as high as 0.5 in the Restigouche
- large salmon exceed target only by the mark-recapture estimate - the other methods have large salmon spawners at approx. 65% of target
- after much discussion, it was decided that the ER=0.3 angling-based estimate would be supported this year - due to the low water conditions and poor angling success, and the similarity to Gaspe conditions and ER - the mark-recapture estimate is not supported since it is based on only 17 tag returns

6. Prospects
- since grilse are down by about 50%, does this mean a poor year for 2SW returns next year? - seems likely according to Quebec correlations

7. Other

- an in-season or pre-season predictor would be very useful to managers (e.g. R. Firth) - A. Locke to continue working on this
- diver counts should be expanded next year - perhaps a second team?
- not sure of the future of the trapnets - these seem of limited use for assessment purposes - although they provide useful biological data
- we should continue to discuss the conservation spawning target - it may need to be increased

8. Boat traffic study

- P. D'Amours brought a proposal for a study of the effects of boat traffic on salmon and on angling success - it was generally agreed that motor canoe and seadoo traffic is very heavy on the Restigouche and that this impact needs to be documented
- F. Whoriskey and P. D'Amours will work together to produce a proposal for possible funding by ASF
- a copy of the proposal is appended for comments of the working group members - please forward your comments to Pierre.

9. Next meeting

The next meeting (objective: to discuss summer research plans) will be held on May 22, 1996, at 9:30 New Brunswick time, at the Eel River Bar Band Hall council chambers.

3.0 STRIPED BASS

3.1 Miramichi River

Wharf Inn, Miramichi
January 19, 1996

Participants:

Normand Allain	Fisher, Richibucto Village
Rod Bradford	New Brunswick Wildlife Federation, Fredericton
Brian Donovan	Angler, Miramichi
Edmond Drysdale	M.F.U. Shédiac
Gerald Dutcher	Fisher, Loggieville
Bernard Duffy	Renous-Dungarvon Rivers Enhancement Group, Renous
Edouard Landry	Fisher, Pokemouche
Jean-Guy Maillet	Richibucto Fisheries Co-op, Richibucto Village
John Murdock	Fisher, Bay du Vin
Rhoda Murdock	Fisher's Wife, Bay du Vin
Ron Nowlan	Fisher, Pokemouche
Gilles T. Power	Fisher, Pokemouche
Eugène Richard	Fisher, Richibucto Village
Earl Rivers	Fisher, Pokemouche
Alvin Scott	Fisher, Miramichi
Bernie Dube	DNRE (NB), Miramichi
Raymond Michaud	NBAPC, Fredericton
Claude Williams	MPA (NB), Bouctouche
Florence Albert	DFO, Tracadie-Sheila
Robert Allain	DFO, Tracadie-Sheila
Rhéal Boucher	DFO, Tracadie-Sheila
Gérald Chaput	DFO Science, Moncton
David Dunn	DFO, Moncton
Mark Hambrook	DFO Science, Miramichi SEC, Miramichi
Bill Scott	DFO, Miramichi

The workshop commenced at 1330 and was chaired by Gérald Chaput. After introduction of all the participants, the agenda and objectives of the workshop were described.

1 - review of highlights of 1994 stock assessment
2 - fisheries in 1995: management and landings
3 - conservation target: management objective
4 - spawner abundance in the Miramichi in 1995: estimates of population size, compared to previous years,
5 - spawning success: up to juvenile stage
6 - stock structure: how many spawning stocks in the Gulf of St. Lawrence
7 - management considerations: are management objectives being met and what are the prospects for 1996 and beyond?
8 - future work on striped bass: collaborations.

Numerous concerns were expressed regarding the type of management which DFO was proposing for striped bass (managed as a recreational species) and the effect this was having on the gaspereau fisheries of the Miramichi. In particular, fishers were concerned that the bycatch privilege was being removed without compensation. Following some brief clarifications by R. Allain, the chair reminded the group that the objectives of the workshop were to review the biology and arrive at a consensus on the status of the resource. This information would then be used to guide management but that these discussions would take place at the annual advisory meetings for the various fisheries.

The 1995 study was sponsored by the New Brunswick Wildlife Federation and funded under the Canada-New Brunswick Co-operative Agreement on Recreational Fisheries. This is the third year of sponsorship and funding under the Rec. Fish. program. Dr. Rod Bradford, working under contract to the New Brunswick Wildlife Federation, was responsible for presenting the results of the 1995 study. Translation (to French) was provided by the chair.

Review of 1994 science study

Spawning population of the Miramichi in 1993 was estimated at 5000 fish and rose to 50000 fish in 1994. In both years, male striped bass, which mature an a younger age than females, made up 90% of the spawning stock. Predictions for 1995 were: an increase in the number of females in the spawning population, fewer age 2 and 3 year old bass based on relative abundance in gaspereau and smelt fisheries, and the presence of repeat spawners (bass which had spawned in previous years).

Fisheries Management

The management plan remained unchanged. Bycatch retention size limits which had been imposed in 1993 and 1994 were not enforced in 1995. Fishers could retain and sell any size of striped bass. Recreational fisheries limits (minimum size for retention of 68 cm total length, one fish per day retained and a season for retention which opened July 1) remained in effect.

Landings

Landings from bycatch for 1995 were not available at the time of the meeting. No recreational fisheries data are being collected. D. Dunn of DFO indicated that the national survey on recreational fisheries would provide information on striped bass catches in the New Brunswick sport fishery. The survey was to commence shortly with results available in the coming year.

Conservation Target

No target is established for striped bass as is the case for some other species, such as salmon. The target is defined in general terms: to arrest the decline in abundance, to increase abundance, and to sustain abundance at levels corresponding to supporting habitat. These principles guide the management plan.

Spawner abundance

Estimates of spawners in the Miramichi River were obtained by two methods. In 1994, it was observed that the relationship between the number of tags returned from a daily tagging group was directly proportional to the number of days available to the gaspereau fishery. Using those data, it was estimated that the gaspereau traps in the Miramichi captured on average 1.3% of the bass in the area on any given day. Using this value, and knowing the average number of bass per day in the 13 traps in the Northwest Miramichi, estimates of the spawning

stock in 1993 and 1994 were almost identical to the estimates using the mark-recapture data. The estimates were different in 1995, the tag-recapture estimate was about 85000 fish while the gaspereau trap catch method indicated less than 37000 fish. From observations in the field, mainly from detailed sampling of bycatch bass, more females were observed in 1995 than in either of the previous years. The number of bass in the spawning area declines over time such that by the close of the gaspereau fishery, very few bass remain in the area. Abundance upon arrival in the estuary in both 1994 and 1995 appears to have approached 75000 to 100000 fish.

Spawning success

Abundance of young-of-the-year striped bass was estimated from the fall open water smelt fishery of the Miramichi. The average number of bass per smelt trap per day of fishing in 1995 was 475 fish, the highest recorded since the first sampling in 1991. This indicates that spawning success was high in 1995 and depending upon the survival of these young fish over the first winter, should provide be an important part of the spawning stock in 4 to 5 years. The usefulness of such bycatch data was highlighted and the collaboration of the fishers in the Miramichi was gratefully acknowledged.

Stock structure

Based on 5 years of tagging and recapture data, the evidence indicates that there is one population of striped bass in the southern Gulf of St. Lawrence and that the Miramichi River estuary is the source of striped bass production for the region. There is no evidence of production outside the Miramichi estuary. It was pointed out that the spawning area in the Northwest Miramichi in the vicinity of McKays Cove is the only verified spawning location for striped bass, although the Southwest Miramichi has not yet been sampled.

Management considerations

Unregulated bycatch and retention of striped bass in May to November 1995 has introduced a large uncertainty in the reliability of the population estimates of the spring 1995 to predict abundance of spawners in 1996. The 1991 year-class will continue to be the basis for production for at least the next spawning season. Adult abundance will be expected to decline until recruitment to the spawning population from the 1994 and 1995 year classes occurs. There is one management unit for striped bass because production appears restricted to the Miramichi River and harvests are occurring from Nova Scotia to Quebec (Chaleur Bay).

Dave Dunn (DFO) indicated that a workshop is planned for February 15, 1996, to consider the implications of the scientific findings presented today. The objectives of the workshop will be to consider how the resource should be managed to ensure that the bass population is sustained at the most beneficial level possible. The workshop will be open to all interested parties.

Several individuals suggested that the theoretical economic value of the receational striped bass fishery in New Brunswick is exaggerated and used as an example the estimates of the economic value of the salmon recreational fishery at the time of the closure of the commercial fishery which have not been substantiated. The chair launched a challenge to prepare a similar economic analysis of the bycatch fishery value for the workshop using a similar approach to the recreational fishery estimate.

Given that DFO was proposing that striped bass be managed as a recreational fisheries species, Edmond Drysdale requested that at a future science meeting on striped

bass, that the catch of striped bass in the recreational fisheries be tabled. There is concern that the catch in the sport fishery is higher than thought and that it may be as important, if not more important, than the bycatch fisheries in terms of impact on the stock. Dave Dunn (DFO) indicated that catch data would be obtained from the national recreational fisheries survey which will be conducted over the next few months.

Rod Bradford thanked and acknoweldged the cooperation of the gaspereau fishers of the Northwest Miramichi in the last three years. In 1995, in spite of being legally allowed to retain and sell all striped bass, an agreement among the fishers resulted in the tagging and release to the water of over 700 bass which otherwise could have been harvested. Such cooperation is the key to ensuring that the proper management of the resource is based on the best biological information possible.

The workshop ended at 1630.

4.0 AMERICAN SMELT

4.1 Miramichi River

Miramichi Bay Fall Smelt Fishery Science Workshop
Wharf Inn, Miramichi
January 19, 1996

Participants

Normand Allain	Fisher, Richibucto Village
Arthur Arsenault	Fisher, Tracadie-Sheila
Rod Bradford	Consultant, Mt. Uniack, NS
Guy Caissie	Fisher, Grande-Digue
Ken Clark	Fisher, Douglastown
Reginald Comeau	M.F.U.
Edmond Drysdale	M.F.U. Shédiac
Omer Duplessis	Fisher, Bouctouche
Jean Louis Gallant	Cap Pélé
Sterling King	Fisher, Douglastown
Shane Heartz	Biologist, NBCC Miramichi
Edouard Landry	Fisher, Pokemouche
William MacEachern	Fisher, Tabusintac
Jean-Guy Maillet	Pècheries, Cap-Lumière
Althenard Paulin	Fisher, Shippaggan
Gilles T. Power	Fisher, Pokemouche
Harold Somerville	Burnt Church First Nation
Georges L. St. Coeur	Fisher, Lower Néguac
Alvin Scott	Fisher, Miramichi
Arthur Taylor	Fisher, New Mills
Daryl G. Trevors	Fisher, Chatham
Harry Williston	Fisher, Bay du Vin
Raymond Michaud	NBAPC, Fredericton
François Mondo	MPA, Caraquet
Claude Williams	MPA (NB), Bouctouche
Florence Albert	DFO, Tracadie-Sheila
Robert Allain	DFO, Tracadie-Sheila
Rhéal Boucher	DFO, Tracadie-Sheila
Gérald Chaput	DFO Science, Moncton
Rodrique Morin	DFO, Science, Moncton

The workshop commenced at 930 and was chaired by Gérald Chaput. After introduction of all the participants, the agenda and objectives of the workshop were described.

1 - describe the open-water smelt fishery
- species of fish caught
- relative abundance of different species
- variation among locations in the estuary
- variation over time during the open-water season
- variation between years (1994, 1995)

2 - describe size composition of species caught

3 - are there concerns about the species caught
- what are the conditions of the fish stocks (healthy, poor, ...)
- what are the impacts of the catches
- can we suggest changes to the fishery to:
  - improve the efficiency (selectivity) on the directed species
  - reduce impacts on bycatch species

4 - what was wrong with this study? what information are we missing?
Several groundfish fisheries in the Gulf of St. Lawrence are under moratoria and the few remaining fisheries must adhere to strict conservation harvesting plans. The open-water smelt fishery has been rumored to have significant bycatch of groundfish species, namely white hake and winter founder. Without accurate information, this fishery could be unjustly targeted. DFO Science, under contract to Dr. Rod Bradford, undertook the study in 1995 as a follow-up to the 1994 initiative with the objective of providing quantitative data on the open-water smelt fishery in Miramichi Bay in terms of composition and level of bycatch.

Several participants from outside the Miramichi area had concerns that the meeting was to address only the Miramichi fishery and wondered why they had been notified of this meeting. They expected to discuss other points relevant to the smelt fishery of which the most important was the low price being offered this year. Participants were reminded that in the letter announcing the meeting, it was specifically stated that it was a science workshop which would provide information on the results of the open-water monitoring study of Miramichi Bay. Rhéal Boucher reminded everyone that their participation was important because although only the Miramichi Bay fishery had been monitored, DFO wanted to know if the situation observed in the Miramichi in 1994 and 1995 was unique to the Miramichi or was more of a southern Gulf of St. Lawrence situation.

Rod Bradford was the main presenter, Gérald Chaput provided the French translation.

Why study the Miramichi smelt fishery?

It is the single largest fishery in eastern Canada representing 30% to 40% of the total landings from the southern Gulf of St. Lawrence. The fall fishery represents 20% to 25% of the annual landings. Bycatch species of concern include white hake, winter flounder and striped bass.

Methods

Rod Bradford undertook direct sampling of the catches. The fishery was sampled in two zones: lower bay at Loggieville and upper bay at Chatham. Individual fishers were accompanied on the fishing trips. The catch was sorted by species, weighed, counted, and samples for length were obtained.

Results

In 1995, the average catch per net per day of fishing was:

White hake	- 16.5 kg per net per day,	282 fish per net per day
Tomcod	- 26.0 kg per net per day,	
Smelt	- 16.6 kg per net per day,	
Winter flounder	- 3.7 kg per net per day,	
Striped bass - not weighed,		475 fish per net per day.

The bycatch of other species relative to smelt was lower in 1995 compared to 1994. In 1994, the following catch rates were observed:

White hake	- 33.2 kg per net per day,	217 fish per net per day,
Tomcod	- 25.4 kg per net per day,	
Smelt	- 8.4 kg per net per day,	
Winter flounder	- 2.2 kg per net per day,	
Striped bass - not weighed,		98 fish per net per day.

Using these catch rate estimates, the catches by species for the open-water season in the Loggieville and Chatham areas were:

	1994	1995
Smelt	12 tons	17 tons
Tomcod	34 tons	27 tons
White hake	44 tons	17 tons
Winter flounder	3 tons	4 tons

Striped bass bycatch is mostly young-of-the-year and is estimated as numbers caught

131000 fish	501000 fish

These quantities are fish caught, not necessarily harvested. White hake, winter flounder, and striped bass are returned to the water but the survival rates of these discarded fish are unknown.

The only species for which there was a noticeable decline in catch over the season was for striped bass at the Loggieville site. Catches of young-of-the-year striped bass were highest at the start of the season, Oct. 15, and declined to negligible values by the season end.

Winter flounder and tomcod had the widest size range in the catches. For winter flounder and tomcod, 50% of the biomass caught was comprised of fish less than 25 cm total length but these small fish made up more than 85% of the catch in terms of numbers. For white hake, fish less than 20 cm made up 50% of the biomass but almost 70% of the catch in terms of numbers. More than 90% of the biomass and numbers of striped bass were less than 15 cm fork length (these were young-of-the-year). Smelt had the most even distribution, 50% of the biomass consisted of smelt greater than 16 cm and in terms of numbers, 50% of the catch was made up of smelt greater than 15 cm.

The minimum size for tomcod increased from 6 inches to 7 inches, resulting in about a 10% marketable biomass in 1995 relative to 1994.

The conclusions were:

- in 1995, the extent of bycatch in terms of weight was less than in 1994. The white hake catch was half the level in 1994, winter flounder and tomcod catch levels were similar but smelt catch was higher in 1995.

Several fishers from the Miramichi area provided some important insights.

1 Mr. Alvin Scott indicated that two years of observations are insufficient to conclude anything on the bycatch in the openwater fishery. Hake occurs periodically in the Miramichi, not every year. In the late 1950s, there were no hake in the Miramichi. There is large variation in the abundance of hake in smelt nets over a 10-year period. This point was supported by Mr. Daryl Trevors experience regarding hake catches. It was also indicated that bass of all sizes are flushed out by freshets and appear in traps following an increase in river flow.

2 Mr. Ken Clark indicated that the location of the nets is also an important factor. Where he fishes, he seldom sees hake, his nets have high catches of tomcod.

3 Mr. Alvin Scott asked if weather conditions had been factored into the analysis because these affect catches immensely. These data could be considered but had not been to date.

An informal survey of conditions in other areas of the Gulf was conducted by asking fishers to provide an indication of whether the bycatches observed in the Miramichi are similar to those in their areas.

Baie des Chaleurs (New Mills)
No open-water smelt fishery. Results are not comparable.

Shippagan
One fisher that operates a gillnet fishery for smelt claimed that there was little bycatch in the smelt fishery, other than some tomcod. Smelt catches have declined over the past 3-4 years.

Pokemouche
Bycatches were not as severe, some striped bass and tomcod, occasionally hake. Many fishers use gillnets rather than bagnets. Smelt fishery is strong and about 90% of the catch is smelt.

Baie de Tracadie
One fisher stated that he abandonned the open-water fishery because of excessive bycatch and the need to sort the catch. The smelt fishery has affected the fish communities. He maintains that gillnets are more selective for large smelt, whereas box nets take several species.

Tabusintac
Juvenile bass and some trout are caught in the fall smelt fishery. Very few winter flounder are caught. Bycatches are dependent on freshets.

Néguac
Smelt fishery is roughly half smelt and half bycatch. Tomcod and juvenile herring contribute most of the bycatch.

Richibucto
Fall fisheries catch all species, probably same extent as in Miramichi.

Cocagne
Not much winter flounder in the bycatch and winter flounder tend to be large (>10 inches).

Not much tomcod. The smelt fishery is conducted mostly in the autumn because there is not enougth water in the winter to conduct a smelt fishery.

Several individuals indicated that they had switched to gillnets because of the high bycatch in bagnets and they felt that this trapnet gear should not be allowed. This opinion was obviously not shared by everyone.

Rodrique Morin, DFO Science, provided an overview of the status of the winter flounder and white hake stocks of the southern Gulf of St. Lawrence.

For winter flounder, the important points were:

- there is uncertainty about landing statistics for winter flounder. Landings have decreased since 1991 but the reduction was comparable to the previously observed annual variation.
- species is not under quota management
- it is a coastal species, considered to be composed of multiple stocks,
- the yearly DFO groundfish survey does not cover inshore habitat where winter flounder are found.. Overall, the stock status is considered to be at moderate to low level but it varies regionally. In the Miramichi region, winter flounder is at an intermediate level of abundance compared to the past 25 years.

For white hake, the important points were:

- the fisheries for this species were under moratoria in 1995 (closed)
- annual research surveys indicate a shift in overall distribution in the Gulf. In the past, white hake were found throughout the Gulf, the distribution is now mostly east of PEI and in St. George's Bay. The stock is considered to be at a low level and is particularly scarce in the western parts of the southern Gulf.

In summary, the status of the winter flounder stock of the Miramichi area is considered to be average relative to the long-term trend. The status of the white hake is considered to have declined and is at a low level relative to the long-term trend.

There was a brief discussion on possible changes to the gear which would reduce the level of bycatch and/or focus on the marketable product. Generally, changes in mesh size were not well received - increases in mesh size would mean decreased smelt catches (the species of interest) and would lead to meshing of fish in the gear which would defeat the purpose. This question was deferred to the regular consultation meetings after fishers and fisheries management had considered the information presented during the science workshop.

The meeting was closed after reminding participants that the everyone was now working from the same information base. The challenge facing the industry and fisheries management was to determine if the present fishery is sustainable for all species or if changes are required. If the fishery needs to be modified, what would industry suggest.

The meeting adjourned at 1215.

5.0 ATLANTIC SILVERSIDE

5.1 Prince Edward Island Silversides

Meeting scheduled for later in February 1996.

6.0 AMERICAN EELS

6.1 Adult Eel Fisheries in Scotia Fundy Area

No meetings held since 1993, but expect to be scheduled in 1996.

6.0 AMERICAN EELS

6.2 Elver Fishery in the Maritime Provinces

A meeting in DFO offices was held during December 1995 with a core group of Elver fishers to discuss aspects of the fishery and licensing policy. No record of that meeting is available.

PART III APPENDICES

APPENDIX 1.1

Science Branch
Maritimes Region
343 Archibald Street
Moncton, N.B.
E1C 9B6

January 22, 1996

Dear Resource User:

This letter gives notice of the scientific peer review session for Maritimes Region diadromous fish stocks. The review will take place February 5-9, 1996, in the Miramichi Room of the Gulf Fishery Centre, 343 Archibald Street, Moncton, N. B. It will commence at 9:00 a.m. on Monday, the 5th.

You and/or representatives of your organization are welcome to come and participate in the discussion of those stocks in which you have interest. Formal referees have been named for each stock presentation, but time is being made available for others, such as yourself, who might have questions or wish elaboration on a particular stock assessment. Enclosed is a proposed agenda and schedule for presentation of the various stock assessments.

We hope your interests will be represented at the review; however, we are unable to assist with travel expenses.

Sincerely yours,

J. A. Ritter
Manager
Diadromous Fish Division

Attachment

APPENDIX 1.2

ANGLERS

Peter Holland
Brunswick Aquaculture Limited
P.O. Box 7041, Station A
St. John, N.B.
E2L 4S4

Bill Taylor, A/President
Atlantic Salmon Federation
P.O. Box 429
St. Andrews, N.B.
EOG 2X0

Jim Gillespie, President
New Brunswick Salmon Council
103 Robin Hood Lane
Rothesay, N.B.
E2G IH8

Fred Wheaton
Chairman, Fisheries Committee
56 Drummond Street
Moncton, N.B.
EIA 2Z2

Danny Bird, Regional Coordinator
Atlantic Salmon Federation
Education & Public Awareness Program
Southern N.B., P.O. Box 429
St. Andrews, N.B. EOG 2XO

Marshall Kaiser, President
Cape Breton Sport Fish Advisory Committee
General Delivery
Baddeck, N.S.
BOE 1B0

Danny Surette,
EPAP Coordinator
Atlantic Salmon Federation
880 Agatha Street
Bathurst, N.B. E2A 2G7

APPENDIX 1.2

Dale Stickles, President
New Brunswick Wildlife Federation
Box 20211, Fredericton, N.B.
E3B 7A2

Lee Sochasky
St. Croix International Waterway Commission
#8 - #1 Highway
St. Stephen, N.B.
E3L 2Y7

Mike McAdam
EPAP Coordinator
Atlantic Salmon Federation
12 Evergreen Court
Truro, N.S. B2N 5H9

Lewis Hinks
EPAP
Atlantic Salmon Federation
Aboriginal Coordinator
Box 359, Chester, N.S. BOJ IJO

Don Pentz
EPAP Coordinator
Atlantic Salmon Federation
R.R. #1
Pleasantville, N.S. BOR 1G0

Terry MacIntyre, President
Nova Scotia Salmon Association
Box 523, Halifax, N.S.
B3J 2R7

Tony Rodgers, Executive Director
Nova Scotia Wildlife Federation
Box 654, Halifax, N.S.
B3J 2T3

Scott Cook, Chairman
Fish Committee
N.S. Wildlife Federation
R.R. #2, Wolfville, N.S.
BOP IXO

APPENDIX 1.2

Todd Dupuis, EPAP Coordinator
Atlantic Salmon Federation
c/o Watershed Improvement Recreational
Fisheries Organization
Box 2000, Charlottetown, P.E.I. CIA 7N8

Steve Cheverie, President
P.E.I. Wildlife Federation
c/o Cheverie Construction
Souris, P.E.I.
COA 2BO

Wes Myles, Chairman
NB Sportsfishery Advisory Board
P.O. Box 175
Doaktown, N.B.
EOC 1C0

APPENDIX 1.2

FIRST NATION

Chief Robert Atwin
Kingsclear First Nation
P.O. Box 19
R.R. #6
Fredericton, N.B.
E3B 4X7

President Second Peter Barlow
Union of New Brunswick Indians
385 Wilsey Road
Comp. 44, Fredericton, N.B.
E3B 5N6

Chief Wilbur Dedam
Burnt Church First Nation
R.R. #2, Burnt Church, N.B.
EOC IK0

Chief Brenda Miller
Listuguj First Nation
17 Riverside West,
Restigouche, P.Q.
GOC 2R0

Chief William J. Sanipass
Bouctouche First Nation
R.R. #2, Bouctouche
Kent Co., N.B.
EOA IG0

Chief Michael Ward
Red Bank First Nation
P.O. Box 120
Red Bank, N.B.
EOC IW0

Chief Roger Atwin
Oromocto First Nation
P.O. Box 417
R.R. #1
Oromocto, N.B.
E2V 1K0

APPENDIX 1.2

Chief Vincent Simon
Big Cove First Nation
R.R. #I, Site 11, Box 1
Big Cove, N.B.
EOL 2L0

Chief Benjamin Peter Paul
Pabineau First Nation
R.R. #5, Site 26, Box 1
Bathurst, N.B.
E2A 3Y8

Chief Roger Joseph Augustine
Eel Ground First Nation
R.R. #I, Site 3, Box 9
Newcastle, N.B.
EIV 3L8

Chief Floyd Bernard
Edmundston First Nation
R.R. #2
Saint Basile, N.B.
EOL IH0

Chief Second Peter Barlow
Indian Island First Nation
R.R. #2, Site 7, Box 1
Rexton, N.B.
EOA 2L0

Chief Everett Martin
Eel River Bar First Nation
P.O. Box 1660
Dalhousie, N.B.
EOK IB0

Chief Edwin Bernard
Tobique First Nation
R.R. #3
Perth Andover, N.B.
EOJ IV0

Chief Arthur Bear
St. Mary's First Nation
247 Paul Street
Fredericton, N.B.
E3A 2V7

APPENDIX 1.2

Chief Leonard Tomah
Woodstock First Nation
P.O. Box 8, Site 1
R.R. #I
Woodstock, N.B.
EOJ 2B0

Chief Lawrence Toney
Annapolis First Nation
P.O. Box 89
Cambridge Station
BOP IGO

Chief Deborah Robinson
Acadia First Nation
R.R. #4
P.O. Box 5893
Yarmouth, N.S.
B5A 4A8

Charlie Dennis, Director
Mi'Kma'Ki Aboriginal Fisheries Service
R.R.#2, East Bay, N.S.
BOA IHO

Chief Lawrence Paul
Millbrook First Nation
P.O. Box 634
Truro, N.S.
B2N 5E5

Chief Kerry Prosper
Afton First Nation
R.R. #I, Afton, N.S.
BOH IAO

Chief Noel Doucette
Chapel Island First Nation
R.R. #1, St. Peter's
Richmond Co., N.S.
BOE 3BO

Chief Reg Maloney
Shubenacadie First Nation
P.O. Box 350
Shubenacadie, N.S.
BON 2HO

APPENDIX 1.2

Chief Terrance Paul
Membertou First Nation
112 Membertou St.
Sydney, N.S.
BIS 2M9

Chief Frank Meuse Jr.
Bear River First Nation
Box 210
Bear River, N.S.
BOS IBO

Chief Alden Francis
Pictou Landing First Nation
P.O. Box 249
Trenton, N.S.
BOK IXO

Chief Shirley Clarke
Horton (Hantsport) First Nation
P.O. Box 449
Hansport, N.S.
BOP IPO

Chief Morley Googoo
Whycocomagh First Nation
P.O. Box 149
Whycocomagh, N.S.
BOE 3MO

Chief Allison Bernard
Eskasoni First Nation
Eskasoni Post Office
Cape Breton, N.S.
B0A 1J0

Chief Mary Louise Bernard
Wagmatcook First Nation
P.O. Box 237
Baddeck, N.S.
BOE IBO

Chief James Sark
Abegweit Band
P.O. Box 220
Cornwall, P.E.I.
COA IHO

APPENDIX 1.2

Chief Jack Sark
Lennox Island Band Council
P.O. Box 134
Lennox Island, P.E.I.
COB IPO

APPENDIX 1.2

NATIVE FISHERIES

Mr. Roger Hunka, Executive Director
Native Council of Nova Scotia
P.O. Box 1320
Truro, N.S. B2N 5N2

Frank Palmater, President
New Brunswick Aboriginal Peoples Council
320 St. Mary's St.
Fredericton, N.B.
E3A 2S4

Graham Tuplin, President
Native Council of Prince Edward Island
33 Allen St.
Charlottetown, P.E.I.
CIA 2V6

APPENDIX 1.2

GOVERNMENT

Mr. John Kearney
R.E. #2
Lower Hainesville, N.B.
E0H 1J0

M. François Caron, Biologiste
Gouvernement du Québec
Ministère du Loisir, de la Chasse et de la Pêche,
150, boul. René-Levesque Est
Québec, Québec
G1G 1X4

Bernie Dubee
Regional Biologist
80 Pleasant Street
Newcastle, N.B.
EIV IX7

Arnold Boer, Executive Director
New Brunswick Department of Natural
Resources & Energy
Fish & Wildlife Branch
P.O. Box 6000, Fredericton, N.B.
E3B 5HI

Gilles Babin, Park Biologist
Kouchibougouac National Park
Kouchibougouac
Kent County, N.B.
EOA 2A0

Bill Hooper
New Brunswick Department of Natural,
Resources & Energy
Fish & Wildlife Branch
P.O. Box 6000
Fredericton, N.B. E3B 5HI

Alan Madden
Regional Biologist
P.O. Box 277
Campbellton, N.B.
E3N 3G4

APPENDIX 1.2

Peter Cronin
Regional Biologist
R.R. #6
Fredericton, N.B.
E3B 4X7

Tom Pettigrew
Regional Biologist
Hampton, N.B.
EOG 1Z0

Murray Hill, Director of Inland Fisheries
Nova Scotia Department of Fisheries
Box 700, Pictou, N.S.
BOK IHO

Arthur Smith, Director
P.E.I. Department of Environmental Resources
Fisheries & Wildlife Branch
P.O. Box 2000,
Charlottetown, P.E.I.
CIA 7N8

Bruce Smith
P.E.I. Watershed Improvement/Recreational
Fisheries Program
P.O. Box 2000
Charlottetown, P.E.I.
CIA-7N8

Mr. Ed LeBlanc
NB Department of Natural Resources and Energy
Northwest Regional Office
21 Costigan
Edmundston, N.B.
E3V 1W7

Mr. Doug Clay
Fundy National Park
P.O. Box 40
Alma, N.B.
EOA 1B0

APPENDIX 1.3

PEER REVIEW ATTENDANCE
MONCTON - FEBRUARY 5-8, 1996

Attendees:

Ritter, John		Chair	
Adams, Nancy		NS DOF	Monday, Thursday
Amiro, Peter	(R)	DFO - Halifax	
Atkinson, Gary	(R)	DFO - Moncton	
Bielak, Alex	(R)	NBDNRE	(Monday, Tuesday & Wednesday)
Bradford, Rod	(R)	NB Wildlife Federation	
Cairns, David	(R)	DFO - Moncton	
Caissie, Daniel	(R)	DFO - Moncton	
Chaput, Gérald	(R)	DFO - Moncton	
Chiasson, Alyre	(R)	University of Moncton	
Clay, Doug		Parks Canada	Part-time
Claytor, Ross		DFO - Moncton	Part-time
Currie, Allen	(R)	Fisheries Co-op Univ. of NB	
Cutting, Dick	(R)	DFO - Halifax	
Davidson, Kevin	(R)	DFO - Moncton	
Drinkwater, Ken	(R)	DFO - Halifax	
Flagg, Lewis	(R)	Maine Dept Marine Resources	Tuesday & Wednesday
Griffin, Gary		NB Wildlife Federation	Thursday
Guignion, Daryl		University PEI	Wednesday
Harvie, Carolyn	(R)	DFO - Halifax	
Holland, Philip (Mrs.)		Elver Fisher	Tuesday (a.m.)
Hooper, Bill		DNRE	Monday and Tuesday
Hunka, Roger		Native Council of N.S.	Thursday
Jessop, Brian	(R)	DFO - Halifax	
Jones, Ross		DFO - Moncton	
Lacroix, Gilles	(R)	DFO - St. Andrews	
LeBlanc, Paul		DFO - Moncton	
Locke, Andrea	(R)	DFO - Moncton	
Lutzac, Tim	(R)	DFO - Moncton	
Marshall, Larry		DFO - Halifax	
Martin, Tim	(R)	NS Native Council	
Meerburg, Dave	(R)	DFO Ottawa	Monday and Tuesday
Moore, Dave		DFO - Moncton	
Mowbray, Fran		DFO - Moncton	
O'Neil, Shane	(R)	DFO - Halifax	
Pickard, Russell		DFO - Moncton	
Swan, Perry		DFO - Moncton	Part-time
Watt, Walton	(R)	DFO - Halifax	Monday (pm) and Tuesday
Wheaton, Fred		MB Wildlife Federation	Patt-time
Whoriskey, Fred	(R)	Atlantic Salmon Federation	
Wyatt, Jason		Restigouche First Nation	Wednesday

(R) Referee

APPENDIX 1.4

AMENDED JANUARY 26, 1996

AGENDA FOR 1995 DIADROMOUS FISH STOCK ASSESSMENT PEER REVIEW
FEBRUARY 5-9, 1996

Monday, February 5

AM 9:00 - Introduction and Orientation
- Atlantic salmon Northumberland St/N Scotia
- Coffee
- Atlantic salmon Boutouche
- Lunch

PM - Atlantic salmon Miramichi
- Coffee
- Atlantic salmon Southwest NB/St. John

Tuesday, February 6

AM 8:30 - Housekeeping Remarks
- Freshwater Environmental Conditions
- Coffee
- Acid rain Environmental Conditions
- Eels Elvers/Maritimes
- Lunch

PM - Atlantic salmon Restigouche
- Coffee
- Atlantic salmon Nepisiquit
- Atlantic Salmon SFA 15 Overview

Wednesday, February 7

AM 8:30 - Housekeeping Remarks
- Atlantic salmon Cape Breton
- Coffee
- Smelt Miramichi
- Atlantic salmon Inner Fundy
- Lunch

PM - Striped Bass Gulf NB
- Coffee
- Atlantic salmon PEI/Morell
- Marine Environmental Conditions

Thursday, February 8

AM 8:30 - Housekeeping Remarks

APPENDIX 1.4 (Cont'd)...

- Eels/Scotia Fundy
- Coffee
- Atlantic salmon Southern Shore/Lahave
- Silversides PEI
- Lunch
- Atlantic salmon Eastern Shore
- Closing Remarks

APPENDIX 1.5

Maritimes Region
Science Branch
Diadromous Fish Division
343 Archibald Street
Moncton, N.B.
E1C 9B6

January 22, 1996

Dear

Enclosed is a copy of the 1995 document you have been assigned to referee at the diadromous fish stock peer review to be held February 5-9 in Moncton.

For those requiring accommodations, a reservation has been made for you at the Comfort Inn East (Champlain Circle), in a non-smoking room, from February 4-8 (Sunday through Thursday). If you prefer a smoking room or require a shorter reservation, Comfort Inn's telephone numbers are (506) 859-6868 / 1-800-424-6423.

I look forward to seeing you at the peer review.

Sincerely,

John A. Ritter

Attachment

APPENDIX 1.6

1995 DIADROMOUS FISH STOCK ASSESSMENT PEER REVIEW SCHEDULE

SPECIES	ASSESSMENT STOCK	LEAD	REFEREE #1	REFEREE #2
ATLANTIC SALMON	Restigouche	Locke	Fred Whoriskey	Shane O'Neil
	Nepisiguit	Locke	Allen Currie	Kevin Davidson
	SFA 15 Overview	Locke	Fred Whoriskey	Rod Bradford
	Miramichi	Chaput	Dave Meerburg	Carolyn Harvie
	Boutouche	Atkinson	Allen Currie	Tim Lutzac
	PEI/Morell	Cairns	Daryl Guignion	Tim Lutzac
	Northumberland St/Nova Scotia	O'Neil	Dick Cutting	Nancy Adams
	Southwest NB/St. John	Marshall	Alex Bielak	Kevin Davidson
	Inner Fundy	Amiro	Tim Martin	Gerald Chaput
	Cape Breton	Marshall	Dave Meerburg	Alyre Chaisson
	Eastern Shore	O'Neil	Nancy Adams	Gary Atkinson
	Southern Shore/ Lahave	Amiro	Fred Whoriskey	Gilles Lacroix
EELS	Elvers/ Maritimes	Jessop & Chaput	Lewis Flagg	Dick Cutting
	Eels/Scotia Fundy	Jessop	Lewis Flagg	David Cairns
STRIPED BASS	Gulf NB	Bradford & Chaput	Alyre Chaisson	Alex Bielak
SMELT	Miramichi	Chaput	Lewis Flagg	Andrea Locke
SILVERSIDES	PEI	Cairns	Rod Bradford	Brian Jessop
ENVIRONMENTAL CONDITIONS	Freshwater	Caissie (Chaput)	Ken Drinkwater	Walton Watt
	Acid rain	Watt	Gilles Lacroix	Daniel Caissie
	Marine	Drinkwater (Locke)	Peter Amiro	Daniel Caissie