



**REPORT OF THE  
TWENTY-FIFTH  
ANNUAL MEETING  
OF THE COUNCIL**

**Gijón, Spain**

**3 - 6 June 2008**

President: Dr Ken Whelan (European Union)

Vice President: Mr Arni Isaksson (Iceland)

Secretary: Dr Malcolm Windsor

**CNL(08)35**



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***Report of the Twenty-Fifth Annual Meeting of the Council  
of the North Atlantic Salmon Conservation Organization  
Tryp Rey Pelayo Hotel Melia, Gijón, Spain  
3 - 6 June, 2008***

**1. Opening Session**

- 1.1 The President, Dr Ken Whelan, opened the meeting. Welcoming addresses were made by Mr Fernando Curcio (General Director for Research and Aquaculture, Spanish Ministry of Environment and Rural and Marine Environment), Mr Jose Felix Garcia Gaona (Government of the Principado de Asturias), and Mr Jose Manuel Sariego (Deputy Mayor of Gijon). The President thanked the Spanish hosts for their welcoming addresses and then made an Opening Statement on the work of the Organization (Annex 1).
- 1.2 The representatives of Canada, Denmark (in respect of the Faroe Islands and Greenland), the European Union, Iceland, Norway, the Russian Federation and the United States of America made Opening Statements (Annex 2).
- 1.3 An Opening Statement was made by the representative of the European Inland Fisheries Advisory Commission (EIFAC) (Annex 3).
- 1.4 An Opening Statement was made on behalf of all the 13 Non-Government Organizations (NGOs) attending the Annual Meeting (Annex 4).
- 1.5 The President expressed appreciation to the Parties and to the observer organizations for their statements and closed the Opening Session.
- 1.6 A list of participants is given in Annex 5.

**2. Adoption of Agenda**

- 2.1 The Council adopted its agenda, CNL(08)38 (Annex 6).

**3. Election of Officers**

- 3.1 The Council unanimously elected Arni Isaksson (Iceland) as its President and Ms Mary Colligan (USA) as its Vice-President.
- 3.2 The Council offered to extend the appointment of the Secretary for three years. The Secretary accepted and thanked the Parties and all the delegations for their confidence in him and expressed his sincere thanks for the excellent work of the Assistant Secretary, Dr Peter Hutchinson, and to the team in the NASCO Secretariat.

## **4. Financial and Administrative Issues**

### **4.1 Report of the Finance and Administration Committee**

The Chairman of the Finance and Administration Committee, Dr Boris Prischepa (Russian Federation), presented the report of the Committee, CNL(08)5. On the recommendation of the Committee, the Council took the following decisions:

- (i) to accept the audited 2007 annual financial statement, FAC(08)2;
- (ii) to adopt a budget for 2009 and to note a forecast budget for 2010, CNL(08)27 (Annex 7);
- (iii) to appoint PricewaterhouseCoopers (PWC) of Edinburgh as auditors for the 2008 accounts, or such other company as may be agreed by the Secretary following consultation with the Chairman of the Finance and Administration Committee. The Council also agreed to review the desirability of changing auditors in the light of information to be provided by the Secretary at the next Annual Meeting on the cost and other implications of such a change;
- (iv) to adopt the report of the Finance and Administration Committee.

The President thanked Dr Prischepa for his work and for that of the Committee.

## **5. Scientific, Technical, Legal and Other Information**

### **5.1 Secretary's Report**

The Secretary made a report to the Council on: inter-sessional activities; observers at NASCO's meetings; fishing for salmon in international waters; relations with other inter-governmental organizations including information on a meeting of the North Atlantic Regional Fisheries Management Organizations (NARFMOs) and the planned 2011 'Salmon Summit' with NPAFC and ICES. He referred to the fact that Margaret Nicolson had left the organization after seventeen years excellent service for NASCO. He also indicated that the refurbishment of the Headquarters Property was almost complete. The income from the property had been the third biggest contributor to the organization's budget in recent years.

In accordance with Financial Rule 5.5, the Secretary reported on the receipt of contributions for 2008. The US contribution had been delayed but arrangements for payment had been made.

The Secretary reported (CNL(08)21) that since the last Annual Meeting of the Council, one new non-government organization, the Irish Seal Sanctuary, had applied for observer status. The Council agreed that it needed more information in order to make an assessment of whether the Irish Seal Sanctuary should be accredited as an observer to NASCO. The Council agreed that the Secretariat should ask the Irish Seal Sanctuary to describe how it sees its objectives being compatible with NASCO and how it might contribute to the work of the Organization. It was further agreed that when the

President and Secretary had completed their consultations, a recommendation would be made to the Heads of Delegations.

In total, NASCO currently has 33 accredited NGOs.

## **5.2 Report on the Activities of the Organization in 2007**

In accordance with Article 5, paragraph 6 of the Convention, the Council adopted a report to the Parties on the Activities of the Organization in 2007, CNL(08)6.

## **5.3 Announcement of the Tag Return Incentive Scheme Grand Prize**

The President announced that the winner of the \$2,500 Grand Prize was Mr Henning Øverås, Eresfjord, Norway. The Council offered its congratulations to the winner.

## **5.4 Scientific Advice from ICES**

The representative of ICES presented the report of the Advisory Committee (ACOM) to the Council, CNL(08)7 (Annex 8). The ICES presentations to the Council and Commissions were tabled, CNL(08)25.

## **5.5 Scientific Research Fishing in the Convention Area**

The Secretary advised the Council that there had been an application from the SALSEA-Merge project to conduct scientific research fishing. In accordance with the Resolution on Scientific Research Fishing this had been approved following consultations with the Parties.

## **5.6 Report of the International Atlantic Salmon Research Board**

The report of the meeting of the Board, CNL(08)8 (Annex 9), was presented by the Chairman of the Board, Dr Ken Whelan. He reported that the Board had: updated its inventory of research related to salmon mortality in the sea; received advice from its Scientific Advisory Group; and had received a progress report on implementing and promoting the SALSEA programme, including updates on the SALSEA-Merge, SALSEA-North America and SALSEA-Greenland initiatives. The Board had agreed a process for improving coordination of the SALSEA initiatives in the North-East and Northwest Atlantic. The Board had also agreed to fund:

- a continuation of a Canadian study funded in 2007/2008 to examine changes in trophic levels of Atlantic salmon through the marine phase of their life-cycle (approximately £20,000);
- the participation of two scientists in the proposed ICES Study Group to continue to identify and collate further information on biological characteristics of salmon from river populations and fisheries throughout the North Atlantic (up to £5,000).

The Board agreed that it should propose to NPAFC that the 'Salmon Summit' originally planned for 2010 should be postponed until spring 2011 when the SALSEA-

Merge project will be completed. The Board has appointed its Steering Group members for the 'Salmon Summit' and has established a group to review the inventory of research, identify areas where coordination of research might be improved and identify gaps where new research might benefit the SALSEA Programme.

A report on SALSEA-North America was tabled, CNL(08)28 (revised).

## **5.7 Report of the Standing Scientific Committee**

The Chairman of the Standing Scientific Committee, Dr Peter Hutchinson, presented a draft request to ICES for scientific advice. Upon the recommendation of the Committee, the Council adopted a request for scientific advice from ICES, CNL(08)9 (Annex 10).

## **6. Next Steps for NASCO**

### **6.1 Special Session: Progress with the Next Steps Strategy**

#### **(a) *Report of the First Ad Hoc Review Group on the Parties' Implementation Plans***

The final report of the First *Ad Hoc* Review Group, CNL(08)10, (Annex 11) was presented. The Review Group had previously presented the findings of its reviews of the Implementation Plans to the Council at its 2007 meeting. Following this the Parties and jurisdictions had been given an opportunity to revise their plans in the light of the Review Group's comments. At its second meeting, the Group had assessed the revised Implementation Plans and any new plans submitted had been assessed using the agreed format and criteria. Where necessary the Group had asked the President to write to jurisdictions with specific comments and invite them to make final amendments. These final Implementation Plans were then re-assessed. The final outcome of the review was that most of the sixteen plans reviewed were now considered to be satisfactory but for a small number of plans minor issues remained to be addressed in either the focus area or annual reports. The Group had noted that no plans had been received for EU-Portugal or EU-Spain.

A compilation of the final Implementation Plans was made available, CNL(08)11. The Group had considered that the process of developing and reviewing Implementation Plans had a number of benefits including:

- improving clarity on how jurisdictions are managing their salmon stocks;
- providing a basis for demonstrating progress with implementing NASCO's Agreements;
- providing a first step in peer-reviewing management approaches and facilitating an exchange of best practice;
- providing the basis for greater clarity in reporting on management activities.

#### **(b) *Questions to the Parties from the Second Ad Hoc Review Group on the Focus Area***



### *Reports on Management of Salmon Fisheries*

A compilation of Fisheries Management Focus Area Reports was tabled, CNL(08)12. These reports are intended to provide a more in-depth assessment of:

- the measures already in place that address the NASCO Agreements relating to fisheries management;
- further actions proposed within the Implementation Plans to meet these Agreements;
- progress with implementing these actions.

The interim report of the second *Ad Hoc* Review Group was presented, CNL(08)13, (Annex 12). The Group had been asked to: assess the extent to which the information provided in the Fisheries Management Focus Area Reports indicates that NASCO's goals are being, or will be, achieved; highlight issues to be raised and questions to the Parties and jurisdictions; and prepare a short report to be submitted to the President in the course of the 2008 Annual Meeting suggesting additional actions to ensure consistency of fisheries management efforts with NASCO Agreements. The Group had developed a list of issues and questions for the Parties and jurisdictions and these are contained in Annex 4 of its report. However, the Group felt that it would not be possible in the time available at the Annual Meeting to develop a fair and balanced assessment of any additional actions required to ensure consistency of fisheries management efforts with NASCO Agreements. It had, therefore, proposed that it develop its report by 31 October 2008.

(c) *Presentations by the Parties and Jurisdictions on their Focus Area Reports on Management of Salmon Fisheries and responses to Review Group questions*

Presentations on fisheries management focus area reports, were made by Canada, Denmark (Greenland), EU (Finland), EU (France), EU (Germany), EU (Ireland), EU (Sweden), EU – UK (England and Wales), EU - UK (Northern Ireland), EU – UK (Scotland), Iceland, Norway, the Russian Federation and the USA.

During the general discussion of the focus area reports it was recognised that while valuable information had been presented in the focus area reports it would be important to take the opportunity to develop a format from the review. While the original role of the *Ad Hoc* Review Group was to report to the President on the additional actions needed to ensure consistency with NASCO's Agreements on the management of salmon fisheries, it was recognised that it would also be useful to identify common challenges and approaches to addressing them and to compile information on best practice.

## **6.2 Decisions by the Council in the light of the 'Next Steps for NASCO' Special Session**

The Council decided that it would ask that the Parties provide responses to the second *Ad Hoc* Review Group's questions in writing to the Secretariat by 31 July 2008. It would be a matter for the Parties and jurisdictions to decide if they wished to submit a

revised focus area report at that time. The Group would complete its remit by providing a report on any additional actions needed by 31 October 2008. The Council encouraged jurisdictions that have not yet submitted focus area reports to do so by 31 July. The Council also wished to encourage those jurisdictions that had not submitted an Implementation Plan to do so at the earliest opportunity.

The Council decided that it would ask the *Ad Hoc* Review Group to undertake an additional task in the form of a comparative overview of the focus area reports highlighting best practice, and challenges and approaches to addressing these challenges in the management of salmon fisheries. The Group's overview would be presented to the Council prior to the next Annual Meeting.

The Council decided that the next stage of the 'Next Steps' process would be to focus on the area of habitat protection and restoration in the Implementation Plans. An *Ad Hoc* Review Group to review this focus area was set up with terms of reference, composition and a timeframe, CNL(08)33 (Annex 13).

The Council also agreed that the draft Terms of Reference, CNL(08)37, for the third focus area, aquaculture and related activities, should be made available to the Parties by 1 July 2008 and any comments forwarded to the Secretariat by 1 April 2009. Any revisions to the Terms of Reference would then be issued prior to the 2009 Annual Meeting.

### **6.3 Progress in implementing a Public Relations Strategy**

At its Twenty-Fourth Annual Meeting the Council had decided, in the light of the report of its Public Relations Group, that in the first instance it would upgrade and improve the website of NASCO and of the IASRB and that the Secretary would produce a model 'State of the Salmon Stocks' report using information from the Parties and from ICES. The Parties had been asked to provide details of educational programmes concerning Atlantic salmon for inclusion in a database of such programmes. The Secretary introduced a report on progress in implementing a Public Relations Strategy for NASCO, CNL(08)14 (Annex 14).

In order to progress this issue the Council established a PR Sub-Group that met during the Annual Meeting with the following objectives:

- propose a structure and contents for the 'State of Salmon Stocks' report on NASCO's website taking into account the elements recommended in CNL(08)14 and any additional components recommended;
- propose the 'Next Steps' on a Communications Strategy.

The report of the Sub-Group was presented, CNL(08)31. The Council recognised that there was a need to identify its target audiences and the products needed to assist NASCO in its outreach programme.

With regard to the 'State of Salmon Stocks' report and the website design the Council decided to proceed with the first four elements listed on page 2 of document

CNL(08)31.

With regard to the appointment of a Communications Officer it was agreed, in the first instance, to explore the possibility of using a consultant who was accustomed to such work. The representative of Canada offered to report back to the Secretary after contacting a PR consultant known to him. The Parties could also suggest other individuals or companies that might be suitable.

The Public Relations Group would remain in existence and work at subsequent Annual Meetings to prepare a communications plan for the following twelve months that would highlight the events taking place over that period indicating the jurisdiction that might take responsibility for a particular outreach activity and note dates for preparation of media releases. A network of key contacts within each jurisdiction (media professionals) would be identified by the Parties and information relative to that event would be circulated to them for drafting or revision with a local flavour as appropriate.

#### **6.4 Performance Review of the Work of NASCO**

At its last Annual Meeting the Council had considered proposals by the European Union, CNL(07)43, in line with those requested of the various RFMOs, and by the USA, CNL(07)48, for a Performance Review of NASCO. The Council had considered this matter in the light of the 'Next Steps for NASCO' review process, which has been carried out in an open and public fashion over the past three years, and the detailed nature of the decisions taken by the Council to implement broad-ranging changes in the manner in which NASCO operates and its relationship with its NGOs.

The Council recognised that the timing of any further review is critically important given that the Organization is in the midst of implementing the core elements of the 'Next Steps for NASCO' process. Therefore, the Parties committed to set up, at NASCO's 2010 Annual Meeting, a Review Group to assess the whole of the 'Next Steps' Process and any other NASCO-related topics that it deems relevant in accordance with the spirit of UNGA Resolution 61/105. That Group would be asked to report on what the process had delivered, where it had worked well, where it needed to be adjusted or changed and how the next cycle should operate. This Group would also advise the Council on the need for and format of a further performance review.

### **7. Conservation, Restoration, Enhancement and Rational Management of Atlantic Salmon under the Precautionary Approach**

#### **7.1 Annual Reports on Implementation Plans**

A report on the returns made on the Implementation Plans was presented, CNL(08)15. The primary purpose of the annual returns is to track progress in implementing the actions contained in the Implementation Plans. The Secretary referred to the need to keep the reporting burden to appropriate levels. The US and Canada tabled reports on their Implementation Plans, CNL(08)24 and CNL(08)29, respectively. The Council agreed to ask the Secretary to develop a simple reporting structure to be used in 2009 based on the guidelines for developing Implementation Plans and reporting on progress, that should include the reporting obligations under the Convention.

## 7.2 Aquaculture, Introductions and Transfers, and Transgenics

### (a) *The Williamsburg Resolution*

At its 2003 Annual Meeting the Council adopted the Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimise Impacts from Aquaculture, Introductions and Transfers and Transgenics on the Wild Salmon Stocks, the Williamsburg Resolution, CNL(03)57. It was recognized that the Williamsburg Resolution would evolve in the light of experience with its implementation, consultations, improved scientific understanding of the impacts of aquaculture and development in measures to minimise them. There had been no proposals from ISFA or the Parties for changes to the Resolution.

### (b) *Liaison with the Salmon Farming Industry*

At its last Annual Meeting the Council had considered a report from its Liaison Group with the North Atlantic salmon farming industry, CNL(07)18. Following the Liaison Group meeting a discussion document had been developed by the International Salmon Farmers Association (ISFA) entitled 'Incentivising the Industry', CNL(07)30. The Council had agreed to respond to ISFA indicating that there were proposals in their paper that would be acceptable, some that could be the subject of cooperation and others that would need further consideration. To advance this initiative the Council agreed to propose to ISFA that a joint Technical Task Force be set up with membership from the two Secretariats and two or three nominated experts from NASCO and ISFA.

A report on liaison with the North Atlantic Salmon Farming industry was presented, CNL(08)16 (Annex 15). In accordance with the Council's decision, the President of NASCO had written to the President of ISFA to express NASCO's concerns and to propose the establishment of the Task Force. Subsequently the Secretary had met with the President and Secretary of ISFA and following that meeting a letter had been received from the President of ISFA in which ISFA had indicated that it is eager to continue the relationship. However, they had not commented on the proposal for a Task Force but rather had proposed that a full Liaison Group meeting be held in Boston in March 2009.

The Council decided that while it wished to continue dialogue with the industry it was not ready to reconvene the Liaison Group until it had identified and agreed on a series of best practice recommendations to address continuing impacts of salmon farming on wild salmon stocks. The outcome of the NASCO/ICES Bergen Symposium and other recent work would seem a good basis. To this end, the Council decided to proceed with a Task Force comprising representatives of the Parties and an NGO representative and to which ISFA experts would be invited to participate. The Terms of Reference for the Task Force would be to develop a series of best practice recommendations to address the continuing impacts of salmon farming on wild salmon stocks designed to achieve impact targets. The Secretary was asked to liaise with the Parties, the NGOs and ISFA on arrangements for the meeting. Recognising the importance of a close relationship with the industry in addressing documented and potential impacts of aquaculture on the wild stocks the Council agreed to consider the timing for the next

Liaison Group meeting in the light of the findings of the Task Force.

The NGO representative indicated that proceeding with the Liaison Group meeting as proposed by ISFA would be a waste of time but that they agreed with the proposal for a Task Force meeting. He suggested that as the industry now comprises a small number of large Norwegian companies there might also be merit in approaching them direct. The President proposed that this suggestion be considered in the light of the Task Force meeting.

### **7.3 New or Emerging Opportunities for, or Threats to, Salmon Conservation and Management**

In accordance with the 'Strategic Approach for NASCO's Next Steps', this item had been included on the Council's agenda and ICES had been requested to provide relevant information, which is contained in document CNL(08)7. The US tabled document CNL(08)23 (Annex 16). Reference was made to the detection of resistance of sea lice to treatments at farm sites in Norway (see CNL(08)15).

### **7.4 Report of the Working Group on Socio-Economics**

Under the Strategic Approach for NASCO's 'Next Step', CNL(05)49, the key issues identified in relation to the social and economic aspects of the wild Atlantic salmon are:

- ensuring that appropriate emphasis is given to the social and economic aspects of the wild Atlantic salmon;
- strengthening the socio-economic data as a basis for managing salmon;
- integrating socio-economic aspects in decision-making processes; and
- disseminating socio-economic information to ensure due weight is given to the salmon compared to other important commercial and public interests.

To progress these aspects the Council had established a Working Group on Socio-Economics which had met in Reykjavik, Iceland during 4-6 March 2008. The interim report of the meeting, CNL(08)17 (Annex 17) was presented by the Secretary who had chaired the meeting. The Group had noted that the collection, analysis and integration of socio-economic information to aid management is far behind the collection, analysis and integration of biological information. The main task for the Group had been to develop an international collation of available social and economic information on the wild Atlantic salmon so as to allow the wild Atlantic salmon to be assessed at its rightful social, cultural and economic levels. The Group had urged those countries that had not yet provided information to contribute to this important new data resource. The Group had also reviewed progress in developing a bio-economic model which will now be tested using data from Scotland and/or Norway. He reported that a new study of the "existence" value of salmon in England and Wales indicated a willingness to pay of £350 million per year when aggregated across all households. Thus consideration only of the values associated with use of the resource greatly under-estimate the salmon's full value. A more comprehensive report of the group's work will be presented in 2009.

The Council agreed to allocate some time at that meeting to a Special Session on socio-

economics.

All delegations recognised the importance of developing more knowledge on socio-economic values relating to wild salmon. It was recognised that the Group had further work to undertake in developing appropriate methodologies and approaches for incorporating socio-economic factors into management decisions in a balanced manner.

The representative of the European Union urged the Working Group to focus more on the objective of examining the use of socio-economic information in fisheries management.

The NGO representative suggested that the salmon is not only an iconic species but is also an indicator of healthy aquatic environments.

A summary of the findings of a survey of the recreational fishery in Canada was circulated, CNL(08)30.

#### **7.5 Progress with the Development of the Database of Salmon Rivers**

A report on progress with development of the database of salmon rivers was tabled, CNL(08)18. The progress report indicated that the Parties have updated the rivers database information and some Parties have gone further and have entered habitat and habitat impacts information and salmon production data. The Council encouraged the Parties to complete the first task of validating the basic river data at the earliest opportunity as it is now publicly available on the Organization's website. The President suggested that there had been considerable interest in the database from geneticists carrying out baseline studies for the SALSEA Programme.

#### **7.6 St Pierre and Miquelon Salmon Fishery**

At its last Annual Meeting the Council had asked the President to write to the French authorities to invite France (in respect of St Pierre and Miquelon) to accede to the Convention. A report on consultations with France (in respect of St Pierre and Miquelon) was presented, CNL(08)19. A second report from France providing information on the management of the fishery, details of catches and of the number of licences issued, and details of the scientific sampling programme was also tabled, CNL(08)39, (Annex 18). This report was introduced by the representative of France (in respect of St Pierre and Miquelon). The representative of France (in respect of St Pierre and Miquelon) indicated that, a process of consultation has commenced with regard to France (in respect of St Pierre and Miquelon) acceding to the NASCO Convention. The representative of France (in respect of St Pierre and Miquelon) indicated that there had been some concerns that results of any genetics sampling of the fishery could be used to support closure of the fishery. However, having participated in the NASCO meeting, she could better appreciate the Organization's work, its approach to subsistence fisheries and the value of information to inform management. She expressed openness to more cooperation with the US and Canada.

The Council welcomed the cooperation of France (in respect of St Pierre and

Miquelon).

The representative of Canada indicated that at the most recent Canada/France bilateral fisheries meeting he had described to his French counterpart the objectives of NASCO and how France (in respect of St Pierre and Miquelon) could contribute to its work.

#### **7.7 Impacts of Acid Rain on Atlantic Salmon**

The Council noted that the next Focus Area Report would address habitat protection and restoration and that it would be useful if the *Ad Hoc* Review Group on this focus area could provide information on best practice with regard to mitigating impacts of acid rain.

#### **7.8 Reports on the Work of the Three Regional Commissions**

The Chairman of each of the three regional Commissions reported to the Council on the activities of their Commission.

The representative of the NGOs referred to the fact that 38% of the catch in the NEAC area is from mixed stock coastal fisheries. He referred to the powerful tools available to the Parties to address these mixed stock fisheries. He noted that the Habitats' Directive had been a significant factor in ending the Irish drift net fishery and he suggested to the EU delegation that this Directive should be used to protect other designated rivers from the effect of mixed stock fisheries. He also referred to the fact that under Article 8 of the NASCO Convention, a Commission could propose regulatory measures for fishing in the area of fisheries jurisdiction of a member of salmon originating in the rivers of others Parties. This Article could, therefore, be used by the North-East Atlantic Commission, for example, in relation to harvest of Russian or Finnish salmon in the Norwegian mixed stock fishery. He stressed the need for more rapid action to address the remaining mixed stock fisheries.

The representative of Denmark (in respect of the Faroe Islands and Greenland) agreed with the statement made by the NGOs. He indicated that the Faroe Islands had refrained from salmon fishing but noted that the actions taken by the other Parties would be taken into consideration in deciding on the future management of their fishery.

The representative of the EU felt that the NGO statement was unfair and did not reflect the considerable efforts made to manage homewater fisheries as highlighted in the focus area reports. He stressed that his delegation was committed to working with all the means at their disposal to conserve salmon.

The representative of Norway indicated that the NGO statement did not reflect recent developments in Norway where new and stronger regulations are already in place for 2008 which will lead to considerable reductions in salmon harvests. Norway is considering the need to take further measures in 2009 and is developing a licensing system for sea fisheries.

The Canadian representative stated that there is always a need for pressure from the

NGOs for further progress but there is no quick solution to conserving salmon and efforts need to be focused and coordinated.

The President stated that NASCO provided a vitally important forum that is saving salmon now and will do so in the future. He referred to the enormous reductions in netting effort and other measures that have been taken in recent years, in part reflecting the international obligations under NASCO. There is a need to focus on long-lasting results rather than short-term solutions.

The representative of the NGOs indicated that he was a passionate supporter of NASCO. NGOs only wished to urge an increase in the pace of work so as to make further progress in delivering practical results on the ground. The role of NGOs was to encourage governments, and NGOs had been disappointed with the weakness of some commitments in the focus area reports; in pointing out some of the tools at the Parties' disposal, NGOs were attempting to make constructive suggestions to assist the Parties in dealing with the often difficult problems associated with the closure of mixed stock fisheries.

## **8. Other Business**

- 8.1 At the Twenty-Fourth Annual Meeting, in response to a request from the NGOs, the European Union had agreed to provide information on the stock status and management of Baltic salmon. The representative of the European Union tabled paper CNL(08)26 (Annex 19) on salmon management in the Baltic Sea. The Council noted that in the past it had had close cooperation with the International Baltic Sea Fishery Commission. Future management of Baltic salmon would be through community legislation or bilateral agreements with Russia. The Council agreed to seek close cooperation on matters concerning Baltic salmon through the European Union and Russia.

## **9. Date and Place of Next Meeting**

- 9.1 The Council had previously accepted an invitation from Norway to hold its Twenty-Sixth Annual Meeting at a venue to be decided in Norway during 1 - 5 June 2009.
- 9.2 The Council agreed to hold its Twenty-Seventh Annual Meeting during 1 – 4 June 2010 at a place to be decided.

## **10. Report of the Meeting**

- 10.1 The Council agreed the report of the meeting.

## **11. Press Release**

- 11.1 A press release was produced following the meeting, CNL(08)36 (Annex 20).

Note: The annexes mentioned above begin on page 27, following the French translation of the report of the meeting. A list of Council papers is included in Annex 21.



***Compte rendu de la Vingt-cinquième réunion annuelle du Conseil de  
l'Organisation pour la Conservation du Saumon de l'Atlantique Nord  
Hôtel Melia Tryp Rey Pelayo, Gijón, Espagne  
3-6 juin, 2008***

**1. Séance d'ouverture**

- 1.1 Le Président, le Dr Ken Whelan, a ouvert la réunion. M. Fernando Curcio (Directeur Général chargé de la recherche et de l'aquaculture au ministère de l'environnement et du milieu rural et marin du gouvernement espagnol), M. Jose Felix Garcia Gaona (Gouvernement de la Principauté des Asturies), et M. Jose Manuel Sariego (Député-maire de Gijón) ont chacun prononcé une allocution de bienvenue. Le Président a remercié les hôtes espagnols pour leurs allocutions et a ensuite prononcé une allocution d'ouverture portant sur le travail de l'Organisation (annexe 1).
- 1.2 Les représentants du Canada, du Danemark (pour les Iles Féroé et le Groenland), de l'Union européenne, de l'Islande, de la Norvège, de la Fédération de Russie et des États-Unis d'Amérique ont chacun prononcé une allocution d'ouverture (annexe 2).
- 1.3 Le représentant de la Commission Européenne Consultative pour les Pêches dans les eaux Intérieures (CECPI) a également prononcé une allocution d'ouverture (annexe 3).
- 1.4 Une allocution d'ouverture a été prononcée conjointement, au nom des 13 organisations non gouvernementales (ONG) présentes à la Réunion annuelle (annexe 4).
- 1.5 Le Président a exprimé sa reconnaissance aux Parties et aux organisations, présentes à titre d'observateur, pour leurs allocutions et a clos la séance d'ouverture.
- 1.6 Une liste des participants figure à l'annexe 5.

**2. Adoption de l'ordre du jour**

- 2.1 Le Conseil a adopté l'ordre du jour, CNL(08) 38 (annexe 6).

**3. Élection des membres du Comité directeur**

- 3.1 À l'unanimité, le Conseil a élu, Président, M. Arni Isaksson (Islande) et, Vice-présidente, Mme Mary Colligan (États-Unis).
- 3.2 Le Conseil a proposé de prolonger de trois ans le mandat du Secrétaire, qui a accepté la proposition et a remercié l'ensemble des Parties et des délégations pour leur confiance en ses capacités. Il a par ailleurs adressé ses sincères remerciements au Dr. Peter Hutchinson, Secrétaire adjoint, et à l'équipe du Secrétariat de l'OCSAN pour leur excellent travail.

## **4. Questions administratives et d'ordre financier**

### **4.1 Rapport de la Commission financière et administrative**

Le Président de la Commission financière et administrative, le Dr Boris Prischepa (Fédération de Russie), a présenté le rapport de la Commission, CNL(08)5. Fort des recommandations de la Commission, le Conseil a pris les décisions suivantes :

- (i) accepter la déclaration financière révisée de 2007, FAC(08)2 ;
- (ii) adopter un budget pour 2009 et prendre acte du budget prévisionnel pour 2010, CNL(08)27 (annexe 7) ;
- (iii) nommer soit PricewaterhouseCoopers (PWC) d'Édimbourg, Commissaire aux comptes pour l'an 2008, ou toute autre société recevant l'approbation du Secrétaire après consultation auprès du Président de la Commission financière administrative. À ce sujet, le Conseil a également convenu d'examiner le bien-fondé d'un changement de Commissaire aux comptes et ce, à la lumière des informations que le Secrétaire fournira lors de la prochaine Réunion annuelle sur les frais et autres implications que cette opération entraînerait ;
- (iv) adopter le rapport de la Commission financière et administrative.

Le Président a remercié le Dr Prischepa et la Commission pour leur précieux travail.

## **5. Questions scientifiques, techniques, juridiques et autres**

### **5.1 Rapport du Secrétaire**

Le Secrétaire a rendu compte au Conseil des questions suivantes : activités intersessionnelles ; observateurs aux réunions de l'OCSAN ; pêche au saumon dans les eaux internationales ; relations avec, et informations concernant d'autres organismes intergouvernementaux, dont une réunion des organisations régionales de gestion des pêches dans l'Atlantique Nord (NARFMOs) et le sommet prévu en 2011 entre le CIEM et la CPAPN, intitulé « Sommet saumon ». Il a par ailleurs mentionné que Margaret Nicolson avait quitté l'organisation après dix-sept ans d'excellents et loyaux services. Il a également indiqué que le siège social était presque entièrement rénové. Au cours de ces dernières années, le revenu généré par la propriété a représenté la troisième plus importante contribution au budget de l'organisation.

Conformément au règlement financier 5.5, le Secrétaire a dressé un rapport sur les contributions de 2008. Un accord avait été convenu avec les Etats-Unis qui étaient en retard dans le paiement de leur participation.

Le Secrétaire a indiqué que, depuis la dernière réunion du Conseil, une nouvelle organisation non gouvernementale, l'*Irish Seal Sanctuary*, avait fait une demande de statut d'observateur (CNL(08)21). Le Conseil a avoué qu'il avait besoin de plus de renseignements avant de pouvoir se prononcer sur cette demande de statut

d'observateur auprès de l'OCSAN. Le Conseil a convenu de charger le Secrétariat de demander à l'*Irish Seal Sanctuary* de décrire comment ils pensaient que leurs objectifs cadraient avec ceux de l'OCSAN et comment ils envisageaient de participer au travail de l'Organisation. Il a également été décidé que les consultations du Président et du Secrétaire seraient suivies d'une recommandation auprès des Chefs de Délégation.

L'OCSAN compte, en tout, 33 ONG accréditées.

## **5.2 Rapport sur les activités de l'Organisation de 2007**

Le Conseil a adopté le rapport d'activités 2007 de l'Organisation, CNL (08)6, adressé aux Parties conformément à l'article 5, paragraphe 6 de la Convention.

## **5.3 Annonce du gagnant du Grand Prix du Programme d'encouragement au renvoi des marques**

Le Président a annoncé que le gagnant du Grand Prix de 2 500 \$ était M. Henning Øverås, de Eresfjord en Norvège. Le Conseil a présenté ses félicitations au gagnant.

## **5.4 Recommandations scientifiques du CIEM**

Le représentant du CIEM a présenté au Conseil le rapport du Comité consultatif (ACOM), CNL(08)7 (annexe 8). Les présentations du CIEM s'adressant au Conseil et aux réunions des Commissions figurent dans le document CNL(08)25.

## **5.5 Pêche menée à des fins de recherche scientifique dans la zone de la Convention**

Le Secrétaire a informé le Conseil que le projet *SALSEA-Merge* avait présenté une demande d'autorisation de pêche à mener dans le cadre de la recherche scientifique. Conformément à la Résolution concernant la Pêche menée à des fins de recherche scientifique, et suite aux consultations auprès des Parties, cette demande avait été acceptée.

## **5.6 Rapport de la Commission internationale de recherche sur le saumon atlantique**

Le Dr Ken Whelan, Président de la Commission internationale de recherche sur le saumon atlantique, a présenté le rapport de la réunion de ladite Commission CNL(08)12 (annexe 9). Il a indiqué que la Commission avait : mis à jour l'inventaire des recherches concernant la mortalité du saumon en mer ; obtenu des recommandations du Groupe consultatif scientifique ; et reçu un rapport décrivant les progrès effectués quant à la mise en application et la promotion du programme SALSEA. Ce rapport contenait des mises à jour des initiatives *SALSEA-Merge*, *SALSEA-North America* et *SALSEA-Greenland*. La Commission avait convenu d'une procédure afin d'améliorer la coordination des initiatives SALSEA dans l'Atlantique du Nord-est et du Nord-ouest. La Commission avait également accepté de financer :

- la continuation d'une étude canadienne qui avait été financée en 2007/2008 afin d'examiner les modifications des niveaux trophiques du saumon atlantique au cours de la phase marine de leur cycle de vie (£20,000 environ) ;

- la participation de deux scientifiques au groupe d'étude du CIEM qui avait été proposé afin de continuer d'identifier et de rassembler des informations supplémentaires sur les caractéristiques biologiques du saumon provenant des populations de rivières et des pêcheries, sur l'ensemble de l'Atlantique du Nord (£5,000 maximum).

La Commission a convenu qu'elle proposerait à la CPAPN de repousser le « Sommet Saumon », planifié à l'origine pour 2010, au printemps 2011, lorsque le projet *SALSEA-Merge* serait achevé. La Commission a nommé ses membres au Comité directeur du « Sommet Saumon » et a établi un autre groupe chargé de passer en revue l'inventaire de recherche, d'identifier les domaines où l'on pourrait améliorer la coordination des recherches et de déterminer les lacunes où de nouvelles recherches pourraient bénéficier le programme SALSEA.

Un rapport sur *SALSEA-North America* a été présenté, CNL(08)28 (révision).

## 5.7 **Compte rendu du Comité scientifique permanent**

Le Dr Peter Hutchinson, Président du Comité scientifique permanent, a présenté une demande provisoire de recommandations scientifiques adressée au CIEM. Fort de l'avis du Comité, le Conseil a adopté la demande de recommandations scientifiques CNL(08)9 (annexe 10), adressée au CIEM.

## 6. **Décisions à prendre à l'avenir par l'OCSAN**

### 6.1 **Séance spéciale : État d'avancement de la stratégie à appliquer dans le cadre des « décisions à prendre à l'avenir par l'OCSAN »**

#### (a) *Rapport du premier Comité temporaire de révision sur les Programmes de mise en application des Parties*

Une présentation a été faite du tout dernier rapport du premier Comité temporaire de révision, CNL(08)10, (annexe 11). Ce dernier avait en effet déjà présenté les conclusions de son examen des programmes de mise en application au Conseil, lors de la Réunion annuelle de 2007. Suite à cette réunion, on avait offert aux Parties et aux juridictions la possibilité de revoir leur programme à la lumière des commentaires du Comité de révision. Lors de sa seconde réunion, le Comité a ainsi passé en revue les programmes révisés de mise en application ainsi que toute nouvelle proposition de programme, et ce, tout en tenant compte du format et des critères adoptés. Lorsqu'il s'était avéré nécessaire, le Comité avait prié le Président d'écrire aux juridictions concernées afin de leur faire part de remarques spécifiques et de les inviter à effectuer par écrit les toutes dernières modifications. Ces tous derniers programmes de mise en application ont enfin été soumis à un nouvel examen qui a révélé que la plupart des seize programmes étudiés étaient satisfaisants. Toutefois, dans le cas d'une petite minorité, des questions de moindre importance nécessitaient toujours d'être résolues, soit en ce qui concernait le volet spécifique de la gestion de la pêche, soit en ce qui concernait les rapports annuels. Le Comité avait noté que ni l'UE-Portugal, ni l'UE-Espagne n'avait envoyé de programmes.

Une compilation des programmes définitifs de mise en application a été mise à la disposition des Parties, CNL(08)11. Selon le Comité, le processus de mise au point et de révision des programmes de mise en application, présentait plusieurs avantages, dont notamment :

- une plus grande transparence quant à la manière dont les juridictions gèrent leurs stocks de saumons ;
- l'établissement d'un cadre permettant de démontrer les progrès réalisés quant à la mise en application des accords de l'OCSAN ;
- une première étape dans la pratique d'un examen du processus de gestion par les pairs, ce qui par ailleurs facilite un échange des meilleures pratiques ;
- l'établissement d'une base favorisant une méthode de compte rendu plus précis des activités de gestion.

(b) *Questions du second Comité temporaire de révision, adressées aux Parties, concernant les rapports sur le sujet spécifique de la gestion des pêcheries*

Une compilation des rapports concernant le volet spécifique de la gestion des pêcheries a été présentée, CNL(08)12. Ces rapports étaient censés fournir une évaluation plus approfondie :

- des mesures, déjà en place, qui respectent les accords de l'OCSAN concernant la gestion des pêcheries ;
- des initiatives supplémentaires proposées dans le cadre des programmes de mise en application afin de respecter ces accords ;
- des progrès réalisés dans l'exécution de ces initiatives.
- Le rapport du second Comité temporaire de révision a été présenté, CNL(08)13, (annexe 12). Le Comité avait été chargé : d'établir jusqu'à quel point l'information fournie dans les rapports<sup>1</sup> indiquait que les objectifs de l'OCSAN étaient, ou seraient, atteints ; de souligner les questions à soulever et celles à poser aux Parties et juridictions ; et de proposer, en un rapport court, des suggestions de mesures supplémentaires à prendre pour garantir une cohérence entre les efforts de gestion des pêcheries et les accords de l'OCSAN. Ce compte rendu devait être soumis au Président lors de la Réunion annuelle de 2008. Le Comité avait mis au point une liste des points et des questions qui s'adressaient aux Parties et juridictions. Cette liste figure à l'annexe 4 dudit rapport. Le Comité était d'avis qu'il ne serait toutefois pas possible d'effectuer, dans les temps disponibles au cours de la Réunion annuelle, un examen objectif et équitable des mesures supplémentaires nécessaires<sup>2</sup>. Aussi a-t-il proposé d'étoffer son rapport d'ici le 31 Octobre 2008.

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<sup>1</sup> concernant le volet spécifique de la gestion des pêcheries

<sup>2</sup> à la cohérence entre les efforts de gestion de pêche et les accords de l'OCSAN

(c) *Présentations par les Parties et Juridictions des rapports concernant le volet spécifique de la gestion des saumons et réponses aux questions posées par le Comité de révision*

Le Canada, le Danemark (Groenland), l'UE (Finlande), l'UE (France), l'UE (Allemagne), l'UE (Irlande), l'UE (Suède), l'UE – Royaume-Uni (Angleterre et Pays de Galles), l'UE – Royaume-Uni (Irlande du Nord), l'UE – Royaume-Uni (Écosse), l'Islande, la Norvège, la Fédération de la Russie et les États-Unis ont présentés leur rapport respectif sur le sujet spécifique de la gestion des pêcheries.

L'information présentée dans ces rapports s'avérait précieuse. Cependant, il a été reconnu au cours du débat qui a suivi qu'il importait de profiter de cette étude pour définir un format de meilleure pratique. Certes, le rôle principal du Comité temporaire de révision était de rendre compte au Président des mesures supplémentaires nécessaires à la garantie d'une cohérence avec les accords de l'OCSAN en matière de gestion des pêcheries de saumons. Toutefois, il serait également utile d'identifier les défis communs ainsi que les méthodes sélectionnées pour les surmonter et de réunir les informations en une synthèse précisant la meilleure pratique à adopter.

**6.2 Décisions prises par le Conseil à la lumière des conclusions émises lors de la Séance spéciale sur « les décisions à prendre à l'avenir par l'OCSAN »**

Le Conseil a décidé de demander aux Parties d'envoyer leurs réponses aux questions posées par le second Comité temporaire de révision par écrit au Secrétariat avant le 31 juillet 2008. Il en revenait aux Parties et juridictions de décider si elles désiraient soumettre à ce moment là une révision de leurs rapports concernant le volet spécifique de la gestion des pêcheries. Le Comité achèverait son mandat par la rédaction d'un compte rendu qui couvrirait l'ensemble des initiatives supplémentaires à prendre, avant le 31 Octobre 2008. Le Conseil a, de ce fait, incité les juridictions qui n'avaient pas encore soumis de rapport sur ce sujet particulier de le faire avant le 31 juillet. Le Conseil désirait également encourager les juridictions qui n'avaient pas encore soumis de programme de mise en application de le faire aussi rapidement que possible.

Le Conseil a décrété qu'il demanderait au Comité temporaire de révision d'entreprendre une tâche supplémentaire, à savoir une étude comparative des rapports concernant le volet spécifique de gestion des pêcheries. Cette étude signalerait la meilleure pratique adoptée, les défis présentés par la gestion des pêcheries de saumon ainsi que les méthodes employées pour y faire face. Elle serait soumise au Conseil avant la prochaine Réunion annuelle.

Le Conseil a déterminé que la prochaine étape des « décisions à prendre à l'avenir » serait de se pencher sur le volet « protection et restauration de l'habitat » des programmes de mise en application. Pour ce faire, un Comité temporaire de révision chargé d'étudier ce sujet particulier a été constitué. Le mandat, la composition et le calendrier de ce comité figurent au document CNL(08)33 (annexe 13).

Le Conseil a également convenu de diffuser le projet de mandat, CNL(08)36, concernant le troisième volet, à savoir « aquaculture et activités connexes », auprès des Parties avant le 1<sup>er</sup> juillet 2008. Et ce, afin de garantir que le Secrétariat puisse recevoir tout commentaire qui soit avant le 1<sup>er</sup> avril 2009. Toutes révisions éventuelles du

mandat seraient alors diffusées avant la Réunion annuelle de 2009.

### 6.3 Progrès réalisés dans l'exécution d'une stratégie de Relations publiques

Lors de sa Vingt-quatrième réunion annuelle, le Conseil avait décidé, à la lumière des conclusions du rapport de son Groupe chargé des Relations publiques, que, dans un premier temps, il mettrait à niveau et améliorerait le site de l'OCSAN et de la CIRSA. Le Secrétaire avait également été prié de rédiger une première ébauche du document « État des stocks de saumons », s'appuyant sur les informations obtenues auprès des Parties et du CIEM. On avait par ailleurs demandé aux Parties de fournir des renseignements sur les programmes éducatifs concernant le saumon atlantique sauvage de façon à ce que ceux-ci puissent être inclus dans la base de données conçue à cet effet. Le Secrétaire a présenté le rapport CNL(08)14 (annexe 14) décrivant les progrès réalisés dans l'exécution d'une stratégie de relations publique pour l'OCSAN.

Afin de faire progresser cette question, le Conseil a établi un sous-groupe RP. Ce groupe s'était réuni lors de la Réunion annuelle en vue de :

- proposer comment le rapport « État des stocks de saumons » devait être structuré et ce qu'il devait couvrir pour être diffusé sur le site de l'OCSAN. Cette proposition tenait compte des recommandations figurant dans CNL(08)14 ainsi que de toutes autres suggestions d'informations ;
- proposer les « prochaines étapes » à envisager dans la réalisation de la stratégie de communications.

À la suite de la présentation du rapport du Sous-groupe, CNL(08)31, le Conseil a reconnu qu'il importait d'identifier les audiences ciblées et les produits nécessaires pour assister l'OCSAN dans son programme de sensibilisation du grand public (*outreach*).

Concernant la question du rapport sur « l'État des stocks de saumon » et de sa présentation sur le site Internet, le Conseil a décidé de traiter les quatre premiers éléments, tels qu'ils apparaissaient à la page 2 du document CNL(08)31.

Quant à la nomination d'un Préposé à la Communication, il a été convenu, dans un premier temps, d'explorer la possibilité d'employer un consultant expert en la matière. Le représentant du Canada a ainsi offert de contacter un consultant expert en RP dont il avait entendu parler, puis de rendre compte du résultat de cette démarche au Secrétaire. Ceci n'empêchait pas les autres Parties de proposer d'autres individus ou d'autres entreprises appropriées.

Le Groupe de Relations Publiques continuera d'exister et s'attachera, dès les prochaines réunions à préparer un programme de communications pour l'année suivante. Ce programme détaillera les événements qui auront lieu au cours de cette période et indiquera la juridiction qui devrait se charger de telle ou telle autre activité de sensibilisation destinée au grand public (*outreach*). Il signalera également les dates où les communiqués de presse devraient être préparés. De leur côté, les Parties identifieront un réseau de contacts clés (professionnels des médias) dans chacune des

juridictions. Aussi, les informations concernant une manifestation particulière leur seront-elles adressées afin qu'ils rédigent ou adaptent le communiqué de presse ou tout autre texte médiatique en y apportant ce qui est propre à la localité.

#### **6.4 Examen des résultats obtenus par l'OCSAN dans son travail**

Lors de sa dernière Réunion annuelle, le Conseil avait étudié des propositions émises par l'Union européenne, CNL(07)43 et par les États-Unis, CNL(07)48, demandant un examen des performances de l'OCSAN, en accord avec ceux qui avaient été requis des différents Organismes régionaux de gestion des pêcheries (ORGP/*RFMO*). Le Conseil avait étudié cette requête dans le cadre du processus d'étude qui avait lieu au sujet des « Décisions à prendre à l'avenir par l'OCSAN ». Ce processus avait été public. Il avait été entrepris dans un esprit d'ouverture au cours des trois dernières années. Le Conseil avait également examiné cette question à la lumière de la spécificité des décisions qu'il avait prises pour rendre effectives les modifications apportées à la manière dont l'OCSAN opérait ainsi que pour modifier ses rapports avec les ONG.

Cependant, étant donné que l'Organisation était en train de mettre en oeuvre les éléments centraux du processus « Décisions à prendre à l'avenir par l'OCSAN », le choix du moment auquel cet examen devait avoir lieu était, selon le Conseil, capital. Les Parties se sont ainsi engagées à établir un Groupe de révision au cours de la Réunion annuelle de 2010, dans le but d'examiner le processus de « Décisions à prendre à l'avenir par l'OCSAN » dans son ensemble. Ce groupe de révision étudierait également tout autre sujet pertinent à l'OCSAN qui lui semblerait approprié et conforme à l'esprit de la Résolution des NU GA 61/105. Il serait chargé de rendre compte de ce que le processus avait accompli, d'en exposer les points forts et d'indiquer où il nécessitait d'être ajusté ou modifié et comment le prochain cycle devrait être organisé. Il incomberait également à ce groupe de conseiller le Conseil sur la nécessité d'un examen supplémentaire des performances et, le cas échéant, sur le format de cet examen.

### **7. Conservation, restauration, mise en valeur et gestion rationnelle des stocks de saumons dans le cadre de l'approche préventive**

#### **7.1 Rapports annuels portant sur les programmes de mise en application**

Un rapport sur les informations reçues à propos des programmes de mise en application a été présenté, CNL(08)15. L'objectif principal de cet exercice annuel était de suivre la progression de l'exécution des actions mentionnées dans les programmes de mise en application. Le Secrétaire a fait remarquer qu'il était primordial de maintenir la charge de travail impliqué dans l'exercice de compte rendu à un niveau approprié. Les États-Unis et le Canada ont soumis des comptes rendus sur leur programme de mise en application, CNL(08)24 et CNL(08)29 respectivement. Le Conseil a convenu de demander au Secrétaire de mettre au point un simple schéma de compte rendu à utiliser en 2009. Ce modèle serait basé sur les orientations concernant l'élaboration des programmes de mise en application et les comptes rendus de suivi. Aussi cette structure inclurait-elle les obligations de compte rendu aux termes de la Convention.



## 7.2 Aquaculture, introductions et transferts, et transgéniques

### (a) *La Résolution de Williamsburg*

Lors de sa Réunion annuelle de 2003, le Conseil avait adopté la Résolution, prise par les Parties, dans le cadre de la Convention pour la conservation du saumon de l'Atlantique nord, afin de minimiser les effets nuisibles de l'aquaculture, des introductions et transferts et des transgéniques sur les stocks de saumons sauvages, à savoir la Résolution de Williamsburg, CNL(03)57. Il avait été reconnu que la Résolution de Williamsburg évoluerait en fonction de ce qui découlerait de sa mise en application, ainsi que des diverses consultations qui auraient lieu. L'amélioration des connaissances scientifiques sur les effets de l'aquaculture et la mise en place de mesures permettant de les minimiser entraîneraient également une modification de cette Résolution. Ni l'Association Internationale des Éleveurs de Saumons (AIES), ni les Parties n'avaient proposé de modifications à la Résolution.

### (b) *Liaison avec le secteur salmonicole*

Lors de sa dernière Réunion annuelle, le Conseil avait étudié un rapport provenant de son Groupe de liaison oeuvrant avec le secteur salmonicole de l'Atlantique Nord, CNL(07)18. À la suite de la réunion du Groupe de liaison, l'Association Internationale des Éleveurs de Saumons (AIES) avait rédigé un avant-projet, intitulé *Incentivising the Industry* (« Comment motiver le secteur salmonicole »), CNL(07)30. Le Conseil avait convenu de répondre à l'AIES et d'indiquer que certaines des propositions faites étaient acceptables, d'autres nécessitaient un travail de coopération, et d'autres, enfin, une étude plus approfondie. Le Conseil avait décidé de proposer à l'AIES de former une Force Opérationnelle (*Task Force*) technique afin de faire avancer cette initiative. Cette *Task Force* serait composée de représentants des deux Secrétariats ainsi que de deux ou trois experts nommés parmi les membres de l'OCSAN et de l'AIES.

Un rapport traitant des relations avec le secteur des éleveurs de saumons de l'Atlantique Nord a été présenté, CNL(08)16 (annexe 15). Selon la décision du Conseil, le Président de l'OCSAN avait écrit au Président de l'AIES pour exprimer les préoccupations de l'OCSAN et pour proposer l'établissement de la *Task Force*. Le Secrétaire avait, ensuite, rencontré le Président et le Secrétaire de l'AIES. À la suite de cette réunion, le Président de l'AIES avait envoyé un courrier dans lequel il indiquait que l'AIES désirait poursuivre les relations. Ils n'avaient toutefois offert aucun commentaire sur la proposition d'une *Task Force*. À la place, ils avaient proposé qu'une réunion de l'ensemble du groupe de liaison soit organisée à Boston au mois de mars 2009.

Le Conseil a accepté qu'il désirait continuer le dialogue avec le secteur salmonicole. Cependant, il n'était pas prêt à fixer une nouvelle réunion du Groupe de liaison tant qu'il n'avait pas identifié et approuvé une série de recommandations de meilleure pratique pour lutter contre la persistance des effets nuisibles du saumon d'élevage sur les stocks de saumons sauvage. Les conclusions du Symposium OCSAN/CIEM de Bergen et autres travaux récents semblaient constituer un bon point de départ pour atteindre ce but. Le Conseil a par conséquent décidé de donner suite à l'idée de la *Task*

*Force*, constituée de représentants des Parties et d'un représentant d'une ONG et à laquelle seraient également conviés des experts de l'AIES. Le mandat de la *Task Force* serait de mettre au point une série de recommandations de meilleure pratique afin de combattre la persistance des effets nuisibles des saumons d'élevage sur les stocks de saumons sauvages. Ces recommandations étaient censées atteindre les objectifs fixés par les Parties de l'OCSAN dans ce domaine. On pria le Secrétaire de se mettre en rapport avec les Parties, les ONG et l'AIES à propos des dispositifs de la réunion. Reconnaisant l'importance d'une relation étroite avec le secteur salmonicole dans la lutte contre les effets nuisibles (établis ou potentiels) de l'aquaculture sur les stocks sauvages, le Conseil a également convenu de fixer la date d'une autre réunion du Groupe de liaison en fonction des conclusions de la *Task Force*.

Selon le représentant des ONG, une réunion du Groupe de liaison, telle que le proposait l'AIES serait toutefois une perte de temps. En revanche, il appuyait la proposition d'une réunion de la *Task Force*. Il a également suggéré que, puisque le secteur comprenait désormais un petit nombre de grandes entreprises norvégiennes, il y aurait également mérite à les contacter directement. Le Président a proposé que cette suggestion soit considérée dans le cadre de la réunion de la *Task Force*.

### **7.3 Nouvelles opportunités ou opportunités naissantes pour, ou menaces contre, la conservation et la gestion du saumon**

Conformément à l'Approche stratégique prise dans le cadre des « décisions à prendre à l'avenir par l'OCSAN », ce point avait été inclus à l'ordre du jour du Conseil et le CIEM avait été prié de fournir les renseignements appropriés. Ces données d'information figurent au document CNL(08)7. Les États-Unis ont présenté le document CNL(08)23 (annexe 16). Une résistance des poux de mer aux traitements avait été détecté dans des sites d'élevage en Norvège (voir CNL(08)15).

### **7.4 Rapport du Groupe de travail chargé de la question des aspects socio-économiques**

Dans le cadre de l'approche stratégique qui sous-tend les « décisions à prendre à l'avenir » par l'OCSAN, CNL(05)49, les points clés qui concernent les aspects socio-économiques liés au saumon Atlantique sauvage sont les suivants :

- garantir que l'on accorde l'attention qui leur est due aux facteurs socio-économiques liés au saumon atlantique ;
- consolider les données socio-économiques afin qu'elles puissent servir de base à la gestion du saumon atlantique ;
- intégrer les considérations socio-économiques dans le processus de prise de décision de l'OCSAN ;
- et disséminer l'information concernant les aspects socio-économiques associés au saumon atlantique sauvage afin qu'ils reçoivent la considération dont ils sont dignes par rapport à d'autres importants sujets d'intérêts public et commercial.

De façon à faire avancer la tâche dans ce domaine, le Conseil avait établi un Groupe de travail. Ce groupe s'était réuni à Reykjavik, en Islande du 4 au 6 mars 2008. Le Secrétaire, qui avait présidé la réunion, en a présenté le rapport provisoire, CNL(08)17

(annexe 17). Le Groupe avait noté que les travaux de collecte, d'analyse et d'incorporation des informations concernant les facteurs socio-économiques et qui serviraient à faciliter la gestion étaient fort devancées par ceux concernant les aspects biologiques du saumon. La tâche principale du Groupe avait été d'entreprendre au niveau international et selon un format donné, une collecte des données socio-économiques liés au saumon sauvage de l'Atlantique. Et ce, de façon à ce que le saumon sauvage Atlantique soit évalué correctement selon des considérations sociales, culturelles et économiques. Le Groupe avait incité les pays qui n'avaient pas encore fourni de renseignements de contribuer à cette importante nouvelle ressource de données. Le Groupe avait également passé en revue les progrès réalisés dans l'élaboration d'un modèle bioéconomique que l'on testera grâce aux données provenant de l'Écosse et/ou de la Norvège. Le Secrétaire a signalé qu'une nouvelle étude portant sur la valeur de « l'existence » du saumon en Angleterre et au Pays de Galles avait révélé que l'ensemble des ménages regroupés étaient prêts à payer £350 million par an. Par conséquent, ne considérer que les valeurs associées à l'utilisation de la ressource sous estimait grandement la valeur véritable du saumon. Un rapport plus étendu sur le travail du groupe sera présenté en 2009. Le Conseil a convenu d'allouer une période de temps pendant cette réunion à une séance spéciale portant sur le sujet des aspects socio-économiques liés au saumon.

Les délégations ont toutes reconnu l'importance d'obtenir une connaissance plus approfondie des valeurs socio-économiques que représente le saumon sauvage. Le groupe n'avait, certes, pas encore entièrement accompli sa tâche et devait élaborer des méthodes appropriées pour incorporer équitablement les facteurs socio-économiques dans les décisions de gestion.

Le représentant de l'Union européenne a incité le Groupe de travail à se concentrer plus particulièrement sur l'examen de l'utilité des données socio-économiques pour la gestion des pêcheries.

Le représentant des ONG a émis la suggestion que le saumon n'était pas uniquement une espèce symbole mais indiquait également un milieu aquatique sain.

Le résumé des conclusions d'une étude qui portait sur la pêche récréative au Canada a été distribué, CNL(08)30.

## **7.5 Progrès réalisés dans l'élaboration de la base de données des rivières à saumons**

Une présentation a été faite des progrès réalisés dans l'élaboration de la base de données des rivières à saumons, CNL(08)18. Le rapport sur l'évolution du projet indiquait que les Parties avaient mis l'information contenue dans la base de données à jour. Certaines d'entre elles avaient même saisi des informations sur les habitats, les effets nuisibles à l'habitat du saumon et des données sur la production de saumons. Le Conseil a encouragé les Parties à achever la première tâche de cet exercice, à savoir la validation des données de base des rivières, et ce le plus rapidement possible puisque ces données étaient désormais disponibles à tous à partir du site Internet de l'Organisation. Le Président a constaté que la base de données suscitait un très grand intérêt auprès des généticiens qui entreprenaient des études de base pour le programme SALSEA.

## **7.6 Pêcherie de saumons à Saint Pierre et Miquelon**

Au cours de la dernière Réunion annuelle, le Conseil avait demandé au Président d'écrire aux autorités françaises dans le but d'inviter la France (pour Saint Pierre et Miquelon) à devenir membre à la Convention. Un rapport décrivant les consultations qui ont eu lieu avec la France (pour Saint Pierre et Miquelon) a été présenté, CNL(08)19. La représentante de la France (pour Saint Pierre et Miquelon) a également soumis un second rapport, rédigé par les autorités françaises et qui traitait de la gestion de la pêche, donnait des détails des captures et du nombre de permis alloués, CNL(08)39, (annexe 18). Ce rapport contenait également des informations sur le programme d'échantillonnage mené à des fins scientifiques. La représentante de la France (pour Saint Pierre et Miquelon) a confirmé que le processus de consultation à propos de l'accession de la France (pour Saint Pierre et Miquelon) à la Convention de l'OCSAN avait été amorcé. Elle a signalé par ailleurs que l'utilisation potentielle des résultats des échantillonnages génétiques pour fermer la pêche suscitait des inquiétudes. Cependant, sa participation à la réunion de l'OCSAN lui avait permis de mieux apprécier le travail de l'Organisation, de mieux comprendre son approche envers les pêcheries de subsistance et de mieux saisir le rôle de l'information dans une gestion avertie. Elle s'est montrée ouverte à une plus grande coopération avec les Etats-Unis et le Canada.

Le Conseil a accueilli favorablement la coopération de la France (pour Saint Pierre et Miquelon).

Le représentant du Canada a indiqué qu'au cours de la plus récente réunion bilatérale sur les pêches – Canada/France, il avait décrit les objectifs de l'OCSAN à son homologue français et comment la France (pour Saint Pierre et Miquelon) pourrait contribuer à ce travail.

## **7.7 Effets nuisibles des pluies acides sur le saumon atlantique**

Le Conseil a fait remarquer que le rapport du prochain volet d'étude concernerait l'élément « protection et restauration de l'habitat ». Aussi serait-il bon que le Groupe de révision temporaire chargé de cette question puisse contribuer des informations sur la meilleure pratique à adopter afin de mitiger les effets nuisibles des pluies acides.

## **7.8 Comptes rendus sur les activités des trois Commissions régionales**

Les Présidents de chacune des trois Commissions régionales ont soumis au Conseil un compte rendu des activités de leur Commission respective.

Le représentant des ONG s'est reporté au fait que 38% des captures dans la zone de la NEAC provenaient de pêcheries côtières mixtes. Il a fait allusion aux outils efficaces auxquels les Parties pourraient avoir recours pour aborder la question des pêcheries de stocks mixtes. Il a fait remarquer que la Directive sur les Habitats avait été un facteur majeur dans la fermeture de la pêche au filet dérivant d'Irlande. Il a par conséquent suggéré à la délégation de l'UE d'utiliser cette Directive pour protéger d'autres cours

d'eau désignés contre les répercussions des pêcheries de stocks mixtes. Il a également rappelé que, dans le cadre de l'Article 8 de la Convention de l'OCSAN, une Commission pouvait proposer des mesures de réglementation de la pêche (effectuée dans la zone de juridiction de pêche d'un membre donné) sur les saumons provenant de cours d'eau d'autres Parties.. Par conséquent, la Commission de l'Atlantique du Nord-est pouvait, par exemple, arguer de cet article dans le contexte de la récolte de saumons en provenance de la Russie ou de la Finlande dans la pêche à stock mixte norvégienne. Il a souligné la nécessité d'agir plus rapidement pour résoudre la question des autres pêcheries de stock mixte.

Le représentant du Danemark (pour les Iles Féroé et le Groenland) a appuyé l'allocution faite au nom des ONG. Il a indiqué que les Iles Féroé s'étaient abstenues de pêcher le saumon, mais a fait remarquer qu'elles tiendraient compte des initiatives prises par les autres Parties dans leur décision de gestion future de cette pêche.

Selon le représentant de l'UE la déclaration du représentant des ONG n'était pas équitable dans le sens qu'elle ne reflétait pas les efforts considérables déployés pour gérer les pêcheries d'eaux territoriales tels qu'ils avaient été décrits dans les rapports concernant spécifiquement la question de gestion des pêcheries. Il a souligné que sa délégation était engagée à se servir de tous les moyens à leur disposition pour préserver le saumon.

Le représentant de la Norvège a indiqué que la déclaration des ONG ne traduisait pas les développements récents en Norvège où de nouvelles et plus strictes réglementations avaient déjà été mises en place, ce qui aboutira à une grande réduction des récoltes de saumons. Si nécessaire, la Norvège envisageait également de prendre des mesures supplémentaires en 2009. De plus, un système de permis pour les pêches en mer était en cours d'élaboration.

Le représentant du Canada a déclaré qu'une pression continue des ONG était nécessaire pour que les progrès persistent. Il n'y avait toutefois pas de solution rapide pour préserver le saumon. Les efforts devaient être bien ciblés et coordonnés.

Le Président a déclaré que l'OCSAN représentait un forum extrêmement important dans la sauvegarde du saumon, aujourd'hui comme à l'avenir. Il s'est reporté aux réductions massives de l'effort de pêche au filet et aux autres mesures prises ces dernières années qui reflétaient en partie les obligations aux termes de la Convention de l'OCSAN. Il importait de se concentrer sur les résultats à long terme plutôt que sur des solutions à court terme.

Le représentant des ONG a indiqué qu'il était un supporter passionné de l'OCSAN. Les ONG ne désiraient qu'une chose : encourager une accélération du travail de façon à faire progresser plus rapidement les résultats pratiques, sur le terrain. Le rôle des ONG était d'encourager les autorités gouvernementales, mais les ONG avaient été déçues par la faiblesse de certains engagements à propos des rapports sur le volet « Gestion des pêcheries » ; en attirant l'attention sur certains outils qui étaient à la disposition des Parties, les ONG n'essayaient que d'apporter des suggestions constructives ; et ce faisant d'aider les Parties à résoudre les problèmes souvent difficiles associés à la fermeture des pêcheries à stock mixte.

## **8. Divers**

- 8.1 Lors de la Vingt-quatrième réunion annuelle, l'Union européenne avait convenu de fournir des informations sur la gestion du saumon en mer Baltique et sur l'état du stock, en réponse à la demande faite par les ONG. Le représentant de l'Union européenne a présenté le document CNL(08)25 (annexe 19) qui rendait compte de cette gestion en mer Baltique. Le Conseil a fait remarquer qu'il y avait quelques temps de cela, des liens étroits avec la Commission Internationale des Pêches de la Mer Baltique (CIPMB) s'étaient instaurés. La gestion future du saumon de la mer Baltique s'effectuerait par l'intermédiaire de législation communautaire ou d'accords bilatéraux avec la Russie. Le Conseil a, par conséquent, accepté d'encourager une coopération étroite avec la Russie sur tout ce qui concernait le saumon de la mer Baltique, par l'intermédiaire de la Commission Européenne et des autorités appropriées de la Russie.

## **9. Date et lieu de la prochaine réunion**

- 9.1 Le Conseil avait déjà accepté l'invitation offerte par la Norvège de tenir sa Vingt-sixième réunion annuelle dans un lieu à décider par la Norvège du 1 au 5 juin 2009.
- 9.2 Le Conseil a convenu de tenir sa Vingt-septième réunion annuelle du 1 au 4 juin 2010 (lieu à déterminer).

## **10. Compte rendu de la réunion**

- 10.1 Le Conseil a adopté le compte rendu de la réunion

## **11. Communiqué de presse**

- 11.1 Le communiqué de presse CNL(08)37 (annexe 20) a été rédigé après la réunion,.

Note: La liste intégrale des documents du Conseil figure à l'annexe 21.

***Opening Statement made by the President of NASCO***

A cháirde uilligh, fáilte roibh go leir chuig on fiche is a cuigiu crinniu don Aontas an Atlantaigh Thuaidh um Chaomhnu an Bhradain. Mr Curcio, Mr Garcia-Gaona, Deputy Mayor, ladies and gentlemen, welcome to NASCO's Twenty-Fifth Annual Meeting here in this beautiful coastal area of Asturias.

It is indeed a great pleasure to celebrate NASCO's silver jubilee in northern Spain, with its lush and green countryside and rugged coastline, framed by the Picos de Europa and home to some of the world's most beautiful Atlantic salmon rivers. The Secretary and I were in Oviedo several years ago to speak at one of the first major scientific meetings on Spanish salmon stocks and I look forward, with great anticipation, to revisiting later this week some of the most beautiful nursery and spawning areas I have yet encountered. The water in the upper reaches of these fine rivers is as clear as a Slovenian trout stream but as majestic in character as the Royal Dee in Scotland. During my previous visit I was fascinated to learn that the coast running from the French border in the east to the Portuguese border in the south, through the Provinces of Asturias and Galicia, at one time boasted over 50 of Europe's finest Atlantic salmon rivers. Not alone were many of these substantial rivers in their own right but their productivity was immense. This area of Cantabria has been home to man for at least some 15,000 years and during that time the salmon was in turn a major source of both nutrition and commerce, to those living in these beautiful valleys. We are told by the historians that the prehistoric Iberians and Celts, the Phoenicians and Greeks who followed them, barley exploited the rich fisheries of the area but the Romans used the riches of the rivers more extensively. Indeed it is said that it was a Roman general who commented that: "... while in Spain a man will abandon his work, his cattle and even his woman for an opportunity to catch a salmon"!

This year's meeting will bring to fruition several major NASCO initiatives including presentations on the first Focus Area Reports on Management of Salmon Fisheries. This time last year we were busy reviewing the structure and format of the Implementation Plans. May I congratulate all concerned on the positive and professional manner in which parties responded to last year's review of the draft plans and the determined effort that was made to improve on the original formats, in order to ensure that the structure of such plans met the agreed criteria. I was particularly pleased to note that countries such as France and Germany provided detailed Implementation Plans which hopefully will ensure even greater prioritisation of salmon conservation and management throughout mainland Europe. I should also like to thank the two Ad Hoc Groups who meticulously reviewed the various Implementation Plans and the Focus Area Reports for us. Your reports have laid the basis for what I trust will be a very interesting and lively debate during this afternoon's special session.

This, our 25<sup>th</sup> anniversary, also marks the formal launch of the long awaited SALSEA Merge programme and the initiation of the two sister programmes in North America and Greenland. What was only a pipe dream four or five years ago is now a reality and we must now redouble our efforts to ensure that the ambitious targets we have set ourselves are met in full. During the course of our meeting you will be briefed on the research programmes and the results so far but I would like at this point in our meeting to acknowledge the large number of individuals who have worked tirelessly to ensure that our SALSEA vision became a reality.

Ladies and gentlemen we have before us an extensive agenda and three very full days of intensive discussion and debate. I trust we will be in position to make full use of the brief time we have available to us and that you will have an opportunity to contribute fully to the various debates. The *Next Steps for NASCO Process* was agreed in order to ensure that all of our partners played a full and active role in the work of NASCO and this afternoon's Special Session provides just such an opportunity.

Thank you.



***Opening Statements made by the Parties***

## *Opening Statement made by Canada*

Mr. President, Distinguished Delegates, Observers, Ladies and Gentlemen:

First, I would like to thank the Spanish authorities and the Secretariat for bringing the 25<sup>th</sup> annual meeting of NASCO to this beautiful city of Gijon, allowing us to enjoy once again the rich culture of Asturias. And of course we find ourselves near another important Spanish salmon river, the Piles.

Mr. President, despite numerous management actions at various levels there is still little evidence of success – salmon returns remain extremely low. In fact, Canada experienced a major setback in 2007: the catch of Atlantic salmon was 112 tonnes. The returns of large salmon in 2007 remained unchanged from the recent ten years and are the third lowest on record. Returns of small salmon declined sharply (-17%) from 2006 and this is attributed to reduced marine survival. In 2007, conservation limits were met in 36% of the 64 assessed rivers, down from 54% just a few years before. Returns have continued to decline in the southern areas and many populations are threatened with extirpation. In short, the overall situation remains a major concern.

Canada of course is not the only country around this table experiencing bleak results on salmon returns and not fully understanding why. In this context it was encouraging to see the reports of the Irish Marine Institute's research vessel RV *Celtic Explorer* sailing May 16<sup>th</sup> as a first segment of the scientific mission to investigate the migration and distribution of salmon in the Northeast Atlantic. Norwegian and Faroese vessels will also be involved later.

Mr. President, as we all know, the work of the International Atlantic Salmon Research Board and SALSEA are important. Once again, Canada was able to participate in various SALSEA projects relating to salmon mortality such as tracking, tagging, and sampling. To further Canada's commitment to research on understanding mortality at sea, the Minister of Fisheries and Oceans Canada announced a contribution of Can\$800,000 in-kind to a SALSEA program for a 23-day marine survey. A research vessel will be engaged in a marine survey this August. I should note the CCGS *Wilfred Templeman*, is named after a director of research that undertook the first Canadian program in 1965 to catch salmon at sea. This is part of a three-step approach that will look at salmon life history monitoring, tracking salmon migrations, and marine capture surveys to sample the upper column pelagic ecosystem during the early post-smolt phase of Atlantic salmon. Government is also being assisted on some of these endeavours by the Atlantic Salmon Federation with its sonic tracking project. In the future we expect involvement of our First Nations and Aboriginal groups in complementary ventures.

I am also pleased to inform you that Canada will be overhauling its *Fisheries Act*. It is the key authority for managing all fish in Canada and protecting fish habitat. While this legal authority has worked well for several decades it is in need of some changes to address emerging challenges of a modern era. The new Act, once it is approved, contains strong commitments to the precautionary approach to conserve aquatic resources and to ensure a science-based ecosystem approach to fisheries management.

Other initiatives underway in Canada include the development of a Wild Atlantic Salmon Conservation Policy. This will guide governments and stakeholders on initiatives to conserve wild Atlantic salmon. Another initiative is a \$30 million dollar investment by the

federal government, the Atlantic Salmon Endowment Fund, which will be administered by the Atlantic Salmon Conservation Foundation. The income earned on the investment will be used to fund projects that contribute to healthy wild Atlantic salmon and their habitat.

This brings me to the Next Steps Process. I believe that the work that was done to complete the Implementation Plans proved to be a successful endeavour. In Canada, the plan is now seen and used as a reference document. With the focus area report now being reviewed, we hope the final version will become another useful document. Mr. President, Parties have put significant effort into developing these documents but it is turning out to be a most valuable initiative that helps us meet our obligations towards UNGA Resolution 61/105.

In closing, Mr. President, we are looking forward to a very productive week of work and discussions with our NASCO partners.

Thank you

***Opening Statement made by Denmark  
(in respect of the Faroe Islands and Greenland)***

Mr President, Distinguished Delegates and Observers:

The Faroe Islands and Greenland are pleased to participate in the 25<sup>th</sup> Annual Meeting of NASCO, which has brought us here to the beautiful location of Gijón in Asturias in Spain.

I would like to emphasize that the objective of the NASCO Convention is to promote rational management of salmon stocks in the North Atlantic through international co-operation. In essence this provides equal access and exploitation rights to host nations as well as to river nations.

The commercial salmon fishery at sea was once very important to Greenland and to the Faroe Islands. It was imperative for a particular part of our fishing fleet.

Although the salmon still migrate to and feed in our waters, today no commercial fishing takes place. The Faroe Islands and Greenland have agreed to temporarily refrain from commercial exploitation of the salmon stocks in our fisheries zones in order to contribute to the rebuilding of the salmon stocks. We have acted responsibly to the scientific advice for years. But we continue to maintain our full rights to harvest salmon at sea in Faroese and Greenlandic waters in a responsible manner while temporarily refraining from exercising ours rights in the interests of salmon conservation.

The decisions to refrain from fishing are taken based on the conclusions reached by ICES on the status of the salmon stocks. Likewise we expect the home water Parties to take into account the advice from ICES in their management of the salmon fishery.

In view of our continuing restraint, however, we would urge all river states to adopt policies that are fully supportive of our efforts to rebuild the salmon stocks, which depend on the feeding grounds in our waters. Unfortunately some do not. A considerable part of the salmon catches are taken in mixed stock fisheries in coastal areas. This information has been truly documented in the ICES reports for years.

This reveals, that so-called ‘interception fisheries’, for which both the Faroe Islands and Greenland have received so much blame ever since the inception of NASCO, are still conducted in other parts of the NASCO Convention Area.

With this irresponsible approach some Contracting Parties undermine the decisions taken by the Faroe Islands and Greenland to refrain from commercial salmon fishing.

Consequently the Faroe Islands and Greenland are keeping an eye on what is going on elsewhere in the NASCO area as we evaluate the fairness in refraining from fishing within our own fisheries jurisdiction.

We therefore welcome the information reported to NASCO in the review processes. With this information we are able to assess how Contracting Parties accomplish their obligations in respect of the Convention, and to assess the balance in management measures in salmon fisheries in the North Atlantic.

This Annual Meeting marks an important step in the scientific co-operation to clarify the mystery of the salmon at sea. I am here referring to the SALSEA-Merge project. We would like to thank everybody involved and the funding organisations. In this respect I am very pleased with the support from the Total Foundation, which will be used to support the Faroese research cruises.

The Faroe Islands and Greenland look forward to working with the other Contracting Parties during the 25<sup>th</sup> Annual Meeting of NASCO.

Thank you.

## *Opening Statement made by the European Union*

Mr President, Ladies and Gentlemen.

On behalf of the European Union and particularly our hosts, the Government of Spain, I would like to welcome you to Gijón for this Twenty-Fifth Annual Meeting of NASCO. I would like to thank our hosts for the excellent arrangements made for our meeting.

It is of concern to the European Union that the catch of wild Atlantic salmon in the North Atlantic in 2007 of 1500 tonnes was the lowest in the time series, was 20% lower than in 2006 and almost 90% lower than the peak catch of 12,500 tonnes in 1973. This reduction in catches reflects declining abundance and the European Union therefore welcomes the launch by the International Atlantic Salmon Research Board of the ambitious and innovative SALSEA Programme. The European Commission is delighted to be associated with this Programme and through the Seventh Research Framework Programme is funding a major element of it, the SALSEA-Merge Project, to the tune of Euro 3.5million out of a total project cost of Euro 5.5million. The Commission is, therefore, the largest contributor to this important research in the North-East Atlantic which was launched in Killybegs, Ireland on 16 May when the Irish Research Vessel, Celtic Explorer, set out on the first of three research surveys to be conducted in both 2008 and 2009. These research cruises aim to increase our understanding of how Atlantic salmon use the ocean; where they go; how they use ocean currents and the ocean's food resources; and what factors influence their migration and distribution at sea.

The European Union also welcomes the Special Session to discuss the focus area reports on management of salmon fisheries developed under the Parties' and jurisdictions' Implementation Plans. We note that not all members have been in a position to provide these reports at the appropriate time but those concerned will provide more information during the Special Session.

We would also like to return to the issue of a Performance Review of NASCO which we proposed last year and which the Council agreed to revisit during this Twenty-Fifth Annual Meeting with a firm commitment, in our view, to undertake such a review. We would simply note at this time that there is an international obligation that has been taken by our governments at the United Nations that all Regional Fisheries Management Organizations, such as NASCO, should as a matter of urgency undertake performance reviews with outside expertise. We trust that the Council will agree here in Spain to proceed with such a review.

Mr President, in closing I would like again to thank our hosts and the Secretariat for the arrangements made for this meeting which we hope will be productive and build on the important work carried out by NASCO over the last quarter of a century. We wish all delegates an enjoyable stay in Gijón.

Thank you.

## *Opening Statement made by Iceland*

Mr. President, Distinguished Delegates, Ladies and Gentlemen

It gives us great pleasure to attend this annual meeting in the picturesque setting of Asturias, where the sun seems to shine in appropriate amounts but the rain also pours to provide lush vegetation and enough water in the rivers for migrating salmonids. We also thank our Spanish host for these fine facilities and for the chance to see the beautiful coast of Asturias.

Turning to our agenda we have some very important issues in front of us. We have the final review on the implementation plans and the first review and presentation of the focus area reports related to fisheries management. As we welcome the change in transparency and openness that coincides with these tasks, I would like to add a word of caution as these reports are getting highly diversified and technical, which may endanger their capacity to be informative for ourselves as well as the NGOs. We are also very happy about the progress with the SALSEA-merge program, which is a special credit to your leadership, Mr. President.

On January 1 2008 the Icelandic Ministries of Agriculture and Fisheries were merged into a single Ministerial unit, which has led to a number of reorganizational activities. The “Icelandic Agricultural Authority”, e.g., which has been responsible for the management of salmon fisheries has been transformed into a “Food and Veterinary Authority” through a merger of various food related management issues. Subsequently the management of salmon and trout fisheries has been transferred to a separate salmonid division within the “Directorate of Fisheries” as of July 1 of this year. This brings the management of all fish into a single management organization, although salmonids are handled within a separate management unit.

The Icelandic angling catch in 2007 was about 53,500 salmon, which is a 15% increase from the previous year. A substantial part of this angling catch (28%), however, comes from rivers, which maintain their angling through smolt releases such as the Rangá rivers. Catches from rivers with natural propagation were thus 6 % under the 30 year annual average. The low catches were partly due to an exceptionally dry salmon season in July and August, which interfered with salmon catches during peak migration periods due to delayed migration into tributaries from mainstem rivers. As experienced in recent years the catches of 2SW salmon were precariously low and anglers were strongly urged to release salmon in that size category.

Although salmon marine cage-culture is no longer practiced to any extent in Iceland, there has been an increase in the cage culture of marine species, mostly onward rearing of wild captured cod. Coinciding with the transfer of salmon management responsibilities to the Directorate of Fisheries a new “Fish Farming Act” has just been passed by the Icelandic Parliament, which places the responsibility for the management of farming of all salmonids as well as all marine species within the Directorate of Fisheries.

Once more ICES has warned us that Southern European MSW stocks should not be fished in mixed stock fisheries due to their poor status. This is more or less confirmed by the apparent decline in Icelandic MSW salmon and all NASCO Parties are sincerely urged to adhere closely to the advice of ICES with respect to this stock component.

Finally, Mr. President, I want to thank you and the NASCO Secretariat for the efficient preparation of the meeting and our Spanish hosts for their excellent hospitality.

## ***Opening statement made by Norway***

Mr President, Distinguished Delegates, Ladies and Gentlemen

It is a great pleasure for the Norwegian delegation to attend this Twenty- Fifth Annual Meeting of NASCO, here in beautiful Asturias.

The wild salmon has historically been, and still is, important to Norwegian and Sami culture.

Social and cultural reasons and values seem in some cases to be more important for this fishery than economic reasons. Only a small proportion of the sea fishermen in Norway are likely to have an economic surplus of their activity.

However, incorporating socio-economic factors in fisheries management in a transparent and informed way, is still suffering from lack of relevant information. We are therefore very pleased with the efforts from the Socio-economics Working Group to develop a comprehensive overview of the values of salmon, and that such data can be incorporated in the State of Salmon report.

Spawning targets have recently been introduced in Norway as an approach to setting management targets as reference points for the fisheries. In 2007 spawning targets were set for 180 rivers representing about 90 % of the yearly salmon catches in Norwegian rivers

Last year, the salmon catch in Norway was one of the lowest recorded. The stock complex also consisted of a remarkably low proportion of 1SW-fish. This is considered to be a serious warning signal, which is reflected in the regulations for the salmon fishery in 2008.

Substantial reductions of the fishing season are adopted for mixed stock fisheries, and in rivers where management targets were not achieved. The main goals for fisheries regulations are to meet spawning targets in all salmon rivers consistently, and to contribute to the reduction of escaped farmed salmon in spawning stocks.

In Finnmark County less strict regulations for the sea fishery were introduced due to viewpoints expressed by the Sami Parliament concerning the special cultural and economic importance of salmon fisheries in the sea to Sami people.

We are very pleased with the follow-up on the next steps process in NASCO. We look forward to this year's focus area reports and Special Session on fisheries management, which will give an indication on the success of the process.

Finally I would like to express my gratitude to our hosts and the Secretariat for having prepared for this meeting.

Thank you!



## ***Opening Statement made by the Russian Federation***

Mr President, Distinguished Delegates, Observers, Ladies and Gentlemen

I have great pleasure in being here in Asturias heading the delegation of the Russian Federation at the 25<sup>th</sup> Annual Meeting of NASCO. It is not the first time that NASCO holds its meeting in Spain. And I take this opportunity now to thank the EU and the Spanish Government for hosting this meeting in this picturesque province, again next to the wild salmon community, an extensive community that spans the whole North Atlantic Ocean. I am very pleased by the splendid arrangements made for us in the City of Gijón!

In this opening statement, I would like to draw your attention to some of the main priorities for the Russian Federation in conservation and management of Atlantic salmon.

Atlantic salmon is a national treasure in Russia. The challenges we all face today in conservation of this species are significant. We fully realize that without international cooperation, without combined efforts in developing the approaches and strategy for future actions no nation could expect to be successful at home.

Atlantic salmon stocks in many rivers in Russia continue to please us with their healthy state. We link this to the Precautionary Approach applied in management of salmon fisheries over a number of years. The use of the Decision Structure developed by NASCO allowed us, in the first place, to optimize the schemes applied for managing the fisheries. The focus was moved from commercial fisheries to recreational fisheries, thereby increasing the benefits from exploitation of the wild Atlantic salmon stocks and reducing the fishing pressure on mixed stocks exploited by net fisheries in coastal waters.

The coastal fisheries are still a significant contributor to catches taken in the North-East Atlantic. It is, therefore, important that all relevant Parties take further restrictive measures for their homewater fisheries, particularly, for those intercepting salmon from neighbouring countries. The Russian Federation is addressing in earnest the situation with mixed stock fisheries in its coastal waters. It is phasing out fisheries in the White Sea, with allocated quotas having gone down from 95 t to 51 t over the last three years.

NASCO has now come to a very important point in its work. After having invested significant effort in the Next Steps process, which we, in fact, view as a part of the performance review of NASCO, the major test for us now is an objective evaluation through our Focus Area Reports of how successful we are in meeting the commitments published in our Implementation Plans and to what extent we are implementing the requirements of NASCO's agreements. This will be a difficult test, but this will also be a much welcomed process of learning from each other, exchanging information and experiences and, furthermore, filling the gaps in our knowledge and rectifying mistakes to better manage and conserve salmon at home.

In Russia we are continuing the restructuring of our fisheries management. Important work has already been done, in particular, a basic law "On fisheries and conservation of aquatic biological resources" was adopted a few years ago and new amendments and additions to it were introduced from 2008, including those relating to the management of salmon fisheries. New territorial directorates of the Federal Agency for Fisheries were established in the regions with much of the Agency's power delegated to them to make the management more flexible

and bring it closer to the users and resources. However, much still remains to be accomplished and, in the first place, in developing the byelaws for implementing the fundamental elements of the Law.

And lastly, I wish to thank most sincerely all those who contributed their hard work and dedication to make the SALSEA, with SALSEA-Merge launched last month, an operative programme, that, I am sure, will advance our understanding of salmon's life in the ocean and factors behind increased marine mortality. Though so far modest, our contribution to this end, we hope, will soon be complemented by studies of the timing and routes of post-smolt migration along the coast of the White Sea, in addition to studies of salmon by-catch in pelagic fisheries in the Norwegian Sea undertaken by Russia in previous years. I would also like to highlight the importance of public-private partnership in implementing the SALSEA Programme and projects aiming at improving our knowledge of such a unique species as Atlantic salmon, in general. In this light I use this opportunity to mention the agreement between the Atlantic Salmon Federation and Polar Research Institute (Murmansk, Russia) to cooperate in fundamental and applied scientific research, which will permit a better understanding and management of wild Atlantic salmon of the Ponoï River, and world-wide.

Mr. President, the delegation of the Russian Federation is looking forward to a very productive meeting and to working closely with you and all the Parties during this week. I am confident that this Annual Meeting will contribute further to the preservation of this unique species for the generations to come.

Thank you.

## ***Opening Statement made by the United States of America***

Mr. President, Distinguished Delegates, Observers, Ladies and Gentlemen:

On behalf of the United States, I would like to thank the European Union and Spain for organizing this Twenty-Fifth Annual Meeting of NASCO in this very beautiful location.

Attention and concern for the future of Atlantic salmon in the United States has intensified over the past year. This year the U.S. Government contributed \$10 million to a collaborative effort to remove two main stem dams on the Penobscot River and create a natural bypass at a third dam. In addition, we are currently considering expanding the existing listing under the Endangered Species Act to include additional Atlantic salmon populations and are in the process of designating critical habitat to bring further attention to those habitats that are essential to the recovery of this species. Our approach to Atlantic salmon recovery is a comprehensive one with a goal of recovering the ecosystems – freshwater, estuarine and marine – upon which salmon depend.

The participation of the U.S. in NASCO is an important component of our comprehensive strategy for Atlantic salmon recovery. In facing the challenge of international conservation and management of Atlantic salmon, NASCO should be proud that it has proven to be not just an Organization that uses the best available scientific information, but one that seeks funding, partnerships and opportunities to collect and analyze data in order to address critical information needs.

I would like to thank you, Mr. President, for your enthusiasm and leadership that has moved SALSEA from a vision to a reality. The manner in which Parties and Jurisdictions have contributed to implement unprecedented research programs is impressive and an excellent example of the power of international collaboration. The investment the U.S. has made in juvenile assessments, smolt trapping and tracking and post smolt cruises will be complemented by SALSEA North America which holds promise of providing insight into the critical marine portion of the life cycle. The U.S. looks forward to further involvement and leadership in SALSEA West Greenland in order to obtain as much information as possible from the fish in the internal use fishery

In 2003 at the Twentieth Anniversary of the Organization, NASCO initiated a Performance Review of the Organization through the Next Steps Process. We are now five years into the process and have completed a comprehensive review of the fitness, efficiency and effectiveness of the Organization with active involvement of our NGO partners and the involvement of a wide range and variety of stakeholders. The review culminated in a suite of recommendations, some of which were implemented immediately and others are still underway. Parties and Jurisdictions have invested a great deal of time and energy to create Implementation Plans in order to increase transparency and accountability and we are undertaking our first Focus Area Review. After the next two Focus Area Reviews are completed, we will have finished the full implementation cycle and will be well positioned to re-assess the Next Steps process to see if our objectives have been achieved.

The United States looks forward to a productive and constructive meeting this week with opportunities to learn from each other through the Focus Area Review Special Session and to plan for the next Focus Area Review. NASCO continues to be a leader in international

fisheries management, demonstrating leadership in its commitment to tangible implementation of the Precautionary Approach, initiative in undertaking a critical review and implementing change, increased transparency and accountability, and collaborative scientific research.

On behalf of the United States, I would like to thank you, Mr. President, the NASCO Secretariat and our hosts for the excellent preparations for this meeting.

***Opening Statement made by the representative of European Inland Fisheries  
Advisory Commission (EIFAC)***

It gives me great pleasure to attend this meeting of NASCO as an observer from the European Inland Fisheries Advisory Commission.

For those that might be unaware, EIFAC is a body of the Food and Agriculture Organization of the United Nations. Established in 1957, it is an inter-governmental forum for collaboration and information exchange on inland fisheries and aquaculture among all European countries. Organizations, institutions and agencies that are involved in managing inland fisheries occasionally need to seek guidance, and EIFAC serves as a network, linking policy-makers, managers, scientists and others working on inland fisheries and aquaculture issues. The scientific work is undertaken in Working Parties by specialists from member countries.

An awareness of European fisheries initiatives and some degree of international consistency in the resolution of fisheries management issues are of increasing importance at the present time. The profile of the pressures on ecosystems and the services that humanity obtains from them is being raised by considerations of Water Framework Directive, climate change and over-fishing, to name but a few. Promoting best practice to the inland fisheries sector and its stakeholders is where EIFAC can help.

If EIFAC is to fulfil its role, and is to function effectively, keeping up to date with all aspects of inland fisheries is vital. Many recreational fisheries are dependent upon the sustainable exploitation of salmon and it is important to safeguard the enduring social, economic and conservation values of such fisheries. It is, therefore, very much appreciated that NASCO extended to EIFAC the invitation to observe this meeting.

I wish you all a productive meeting.

Thank you!



***Opening Statement made by Non-Government Organizations***

Mr President, Colleagues

I am pleased to present the joint opening statement on behalf of the NGO Group. We're delighted to be here in Gijon, not least because this Region of Asturias hosted one of the key working meetings early in the Next Steps process, so some of us are familiar with your excellent organisational skills and hospitality.

The Next Steps process has now been underway for two years, and already NASCO can claim to be the most open and transparent intergovernmental treaty organisation. This year, for example, NGOs have played a full part in the review of Implementation Plans and Focus Area Reports, as well as participating in workshops on *Gyrodactylus* and the socio-economic impacts of salmon management.

We note the comments from the EU to couple a performance review with the review of the Next Steps process; as mere observers we noted the huge amounts of time the debate on that subject wasted last year, when we could have been dealing with more productive topics aimed at conserving Atlantic salmon; the Next Steps process should be completed and, as a comprehensive review process itself, assessed in detail before any additional performance review is undertaken

The production of Implementation Plans was a first key step in making Parties publicly accountable for their salmon management plans, and we would like to applaud the positive way that individual jurisdictions have responded to our constructive criticism by making significant revisions and improvements. We now look forward to drilling down, via the Focus Area Reports on fisheries management, into the detail of those plans. Atlantic salmon stocks remain at historically low levels and ICES have once again highlighted the danger posed by mixed stock fisheries, yet we note from their report that 38% of the catch in the NEAC Region is of coastal origin. Despite considerable progress in reducing such fisheries in recent years, the fact that more than a third of the catch in home waters still comes from mixed stock fisheries is not acceptable, and we will be drawing attention to particular culprits later in the meeting.

Here, towards the southern limits of the salmon's range, it is regrettable that our hosts and their Iberian neighbours, have not yet been able to complete national Implementation Plans of their own. While we appreciate some of the difficulties, it is in precisely these areas where salmon struggle to survive, that application of NASCO agreements and guidelines can greatly assist in the conservation of the species.

We would also like to acknowledge the launch of the SALSEA-Merge programme, and all those who have supported and in particular, funded it: the EU 7<sup>th</sup> Framework Programme, Atlantic Salmon Trust, Atlantic Salmon Federation, FondationTotal, and of course the Parties, especially the recent contribution by Canada. This has been a tremendous team effort, with more than 20 contracting organisations now involved in a public-private partnership, ably led by our President.

One area we will be returning to where we think there is continuing room for improvement is media relations. NGOs from both sides of the Atlantic played a full part in the PR Group meetings held in December 2006, and some progress has been made since then, but on an intermittent basis. We will be calling for better planning and a more consistent approach in future.

Another area of concern is our relationship with the International Fish Farming Community. Last year, NASCO suggested a Task Force approach to target areas of concern and clarify the threat and impacts on wild salmon. The ISFA have responded with a proposal to re-instate full Liaison Group meetings which will simply maintain the status quo; we believe this is a backward step and should be rejected.

Mr President, in looking forward to the coming week, I want to finish by remarking that during the annual meeting, we naturally tend to concentrate on the organisational processes of NASCO; it's most important we remember the basic objectives of this organisation, so that when we go home we can focus our efforts and translate the Next Steps process into practical outcomes that fulfil the primary aim we all share: the conservation of wild Atlantic salmon.



***List of Participants***

\* Denotes Head of Delegation

**CANADA**

|                      |   |
|----------------------|---|
| *Mr Guy Beaupré      | <u>Representative</u><br>Department of Fisheries and Oceans, Ottawa, Ontario                  |
| Mr Bud Bird          | <u>Representative</u><br>Fredericton, New Brunswick   |
| Mr Serge Tremblay    | <u>Representative</u><br>Ministère des Ressources Naturelles et de la Faune du Québec, Québec |
| Mr Robert Allain     | Department of Fisheries and Oceans, Moncton, New Brunswick                                    |
| Mr Tony Blanchard    | Department of Fisheries and Oceans, St Johns, Newfoundland                                    |
| Mr Dani Bussièrès    | Ministère des Ressources Naturelles et de la Faune du Québec, Québec                          |
| Mr Gerald Chaput     | Department of Fisheries and Oceans, Moncton, New Brunswick                                    |
| Mr Stephen A Chase   | The Atlantic Salmon Conservation Foundation, Fredericton, NB, Canada                          |
| Mr Peter Cronin      | New Brunswick Department of Natural Resources, Fredericton, New Brunswick                     |
| Mr Murray Hill       | Department of Fisheries and Aquaculture, Pictou, Nova Scotia                                  |
| Mr David Reddin      | Department of Fisheries and Oceans, St John's, Newfoundland                                   |
| Mrs Susan Rocque     | Department of Fisheries and Oceans, Ottawa, Ontario   |
| Miss Tanya Schlossek | Nunatsiavut Government, Happy Valley-Goose Bay, Newfoundland                                  |
| Mr Tim Young         | Department of Fisheries and Oceans, Ottawa, Ontario   |

## **DENMARK (IN RESPECT OF THE FAROE ISLANDS AND GREENLAND)**

|                         |  |
|-------------------------|--|
| * Mr Andras Kristiansen | <u>Representative</u><br>Ministry of Fisheries and Maritime Affairs, Torshavn, Faroe Islands |
| Dr Jan Arge Jacobsen    | Faroese Fisheries Laboratory, Torshavn, Faroe Islands  |
| Mr Torsteen Overgaard   | Department of Fisheries, Hunting and Agriculture, Nuuk, Greenland                            |

## **EUROPEAN UNION**

|                        |  |
|------------------------|--|
| * Mr Staffan Ekwall    | <u>Representative</u><br>European Commission, Brussels, Belgium              |
| Ms Aleksandra Kordecka | <u>Representative</u><br>European Commission, Brussels, Belgium              |
| Ms Carmen Beraldi      | Secretaria General de Pesca, Madrid, Spain                                   |
| Mr Magnus Bergstrom    | Swedish Board of Fisheries, Gothenburg, Sweden                               |
| Mr Martin Brennan      | Marine and Natural Resources, Dublin, Ireland                                |
| Dr Ciaran Byrne        | Central Fisheries Board, Swords, Dublin, Ireland                             |
| Mr Richard Cowan       | Department of Environment, Food and Rural Affairs, London, England, UK       |
| Mr David Dunkley       | Scottish Executive, Marine Directorate, Edinburgh, Scotland, UK              |
| Ms Ylva Engwall        | Swedish Board of Fisheries, Gothenburg, Sweden                               |
| Dr Jaakko Erkinaro     | Finnish Game and Fisheries Research Institute, Oulu, Finland                 |
| Mr Lal Faherty         | Western Regional Fisheries Board, Galway, Ireland                            |
| Dr Ulrich Fassbender   | Federal Ministry of Consumer Protection, Food and Agriculture, Bonn, Germany |
| Dr Cathal Gallagher    | Central Fisheries Board, Swords, Dublin, Ireland                             |
| Dr Paddy Gargan        | Central Fisheries Board, Swords, Dublin, Ireland                             |

|  |  |
|--|--|
| Dr Trevor Hastings<br>Ms Heather Jones | Fisheries Research Services, Pitlochry, Scotland, UK<br>Scottish Executive, Marine Directorate, Edinburgh,<br>Scotland, UK |
| Mr Richard Kennedy                     | River Bush Salmon Station, Co. Antrim, Ireland   |
| Ms Eija Kirjavainen                    | Ministry of Agriculture and Forestry, Department of<br>Fisheries and Game, Helsinki, Finland                               |
| Mr Marcus McAuley                      | Department of Culture, Arts and Leisure, Belfast, Northern<br>Ireland, UK  |
| Mr John McCartney                      | Loughs Agency, Londonderry, Northern Ireland, UK   |
| Mr Julian C MacLean                    | Fisheries Research Services, Montrose, Scotland, UK  |
| Dr Niall Ó Maoileidigh                 | Marine Institute, Newport, Ireland   |
| Mr Ted Potter                          | Centre for Environment, Fisheries and Aquaculture Science,<br>Lowestoft, England, UK                                       |
| Mr Frank Sheridan                      | Department of Communications, Marine and Natural<br>Resources, Dublin, Ireland   |
| Dr Petri Suuronen                      | Finnish Game and Fisheries Research Institution, Helsinki,<br>Finland  |
| Mr Jouni Tammi                         | Ministry of Agriculture and Forestry, Helsinki, Finland  |
| Dr Luis Teixeira da Costa              | General Secretariat of the Council of the European Union,<br>Brussels  |
| Mrs Benedicte Valadou                  | ONEMA, Délégation Interrégionale Centre, Poitou-<br>Charentes, Orleans, France   |
| Mr Vincent Vauclin                     | ONEMA, Délégation Générale, Fontenay-sous-Bois, France   |
| Dr Ken Whelan                          | <u>President of NASCO</u><br>Marine Institute, Newport, Ireland  |
| Mr Godfrey Williams                    | Environment Agency, Darlington, England, UK  |

## **ICELAND**

|                         |   |
|-------------------------|---|
| * Mr Ingimar Johannsson | <u>Representative</u><br>Ministry of Fisheries and Agriculture, Reykjavik |
|-------------------------|---|

|                      |   |
|----------------------|---|
| Mr Arni Isaksson     | <u>Representative</u><br>Agricultural Authority of Iceland, Selfoss |
| Mr Gudni Gudbergsson | Institute of Freshwater Fisheries, Reykjavik                        |

## **NORWAY**

|                       |   |
|-----------------------|---|
| * Mr Arne Eggereide   | <u>Representative</u><br>Directorate for Nature Management, Trondheim |
| Mr Raoul Bierach      | <u>Representative</u><br>Directorate for Nature Management, Trondheim |
| Mr Vidar Baarøy       | Directorate of Fisheries, Bergen                                      |
| Dr Lars Petter Hansen | Norwegian Institute for Nature Research, Oslo                         |
| Mr Øyvind Walsø       | Directorate for Nature Management, Trondheim                          |

## **RUSSIAN FEDERATION**

|                         |  |
|-------------------------|--|
| *Dr Boris Prischepa     | <u>Representative</u><br>PINRO, Murmansk   |
| Mr Alexey Grushko       | Federal Agency for Fisheries, Moscow   |
| Ms Svetlana Krylova     | Murmanrybvod, Murmansk   |
| Mr Dmitry S Lipatov     | Karelrybvod  |
| Ms Darya Pedich         | Territorial Department of State Committee on Fisheries of the Russian Federation (Goskometbolovstvo) |
| Mr Viacheslav A Movchan | Director, Karelrybvod  |
| Ms Elena Samoylova      | PINRO, Murmansk  |
| Dr Igor Studenov        | SevPINRO, Archangel  |
| Ms Elena N Suslenkova   | Murmanrybvod, Murmansk   |

## **USA**

|                        |  |
|------------------------|--|
| * Ms Patricia A Kurkul | <u>Representative</u><br>NOAA Fisheries, Gloucester, USA |
|------------------------|--|

|                          |  |
|--------------------------|--|
| Mr Stephen Gephard       | <u>Representative</u><br>Department of Environmental Protection, Inland Fisheries<br>Division, Old Lyme, Connecticut |
| Mr George Lapointe       | <u>Representative</u><br>Maine Department of Marine Resources, Augusta,<br>Maine                                     |
| Ms Kimberly Blankenbeker | National Marine Fisheries Service, Silver Spring, Maryland   |
| Ms Mary Colligan         | National Marine Fisheries Service, Gloucester,<br>Massachusetts  |
| Ms Jessica Pruden        | National Marine Fisheries Service, Gloucester,<br>Massachusetts  |

### **STATES NOT PARTIES TO THE CONVENTION**

#### **France (in respect of St Pierre and Miquelon)**

|                                   |   |
|-----------------------------------|---|
| Dr Christiane<br>Laurent-Monpetit | Ministere de l'Intérieur et de l'Outre-Mer, Paris |
|-----------------------------------|---|

### **INTER-GOVERNMENTAL ORGANIZATIONS**

|                 |  |
|-----------------|--|
| Mr Øyvind Walsø | European Inland Fisheries Advisory Commission  |
| Mr Tim Sheehan  | Chairman, ICES Working Group on North Atlantic Salmon,<br>Woods Hole, Massachusetts, USA |

### **NON-GOVERNMENT ORGANIZATIONS**

|   |  |
|---|--|
| Mr Chris Poupard                              | Chairman of NASCO's Accredited NGOs<br>European Anglers' Alliance, Belgium |
| Dr Frederic Mazeaud<br>Mr Christian Vernes    | Association Internationale de Défense du Saumon<br>Atlantique, France      |
| Mr Hugh Campbell Adamson<br>Mr Andrew Wallace | Association of Salmon Fishery Boards, UK                                   |
| Ms Sue Scott                                  | Atlantic Salmon Federation (Canada)  |
| Mr Anthony Andrews<br>Dr Richard Shelton      | Atlantic Salmon Trust, UK  |
| Mr Patrick Martin                             | Conservatoire National du Saumon Sauvage, France                           |

|                   |   |
|-------------------|---|
| Mr Noel Carr      | Federation of Irish Salmon and Sea-Trout Anglers, Ireland |
| Mr John Gregory   | Institute of Fisheries Management, UK                     |
| Mr Patrick Byrne  | National Anglers Representative Association, Ireland      |
| Mr Aage Wold      | Norskelakseelver (Norwegian Salmon Rivers), Norway        |
| Mr Paul Knight    | Salmon and Trout Association, UK                          |
| Mr Niall Greene   | Salmon Watch Ireland (SWIRL), Ireland                     |
| Mr Ian Calcott    | Scottish Anglers National Association, UK                 |
| Mr Martin Arnould | World Wide Fund for Nature, France                        |

### **SECRETARIAT**

|                     |                     |
|---------------------|---------------------|
| Dr Malcolm Windsor  | Secretary           |
| Dr Peter Hutchinson | Assistant Secretary |
| Ms Mairi Ferguson   | PA to the Secretary |
| Miss Louise Erwin   | PA                  |

### **Support Staff**

Miss Rocio Manso Fernández  
Miss Jair González Fernández  
Ms Tatiana Geue  
Mr Claude Eisen  
Mr Pelayo Menéndez de Luarda

**CNL(08)38**

**Twenty-Fifth Annual Meeting of the Council  
Tryp Rey Pelayo Hotel Melia, Gijón, Spain**

**3-6 June, 2008**

***Agenda***

|  | <b>Paper No</b>                              |
|--|--|
| <b>1. Opening Session</b>  |  |
| <b>2. Adoption of Agenda</b>   | CNL(08)1<br>CNL(08)2<br>CNL(08)3<br>CNL(08)4 |
| <b>3. Election of Officers</b>   |  |
| <b>4. Financial and Administrative Issues</b>  |  |
| 4.1 Report of the Finance and Administration Committee   | CNL(08)5                                     |
| <b>5. Scientific, Technical, Legal and Other Information</b>   |  |
| 5.1 Secretary's Report   |  |
| 5.2 Report on the Activities of the Organization in 2007   | CNL(08)6                                     |
| 5.3 Announcement of the Tag Return Incentive Scheme Grand Prize  |  |
| 5.4 Scientific Advice from ICES  | CNL(08)7                                     |
| 5.5 Scientific Research Fishing in the Convention Area   |  |
| 5.6 Report of the International Atlantic Salmon Research Board   | CNL(08)8                                     |
| 5.7 Report of the Standing Scientific Committee  | CNL(08)9                                     |
| <b>6. Next Steps for NASCO</b>   |  |
| 6.1 Special Session: Progress with the Next Steps Strategy   |  |
| (a) Report of the First <i>Ad Hoc</i> Review Group on the Parties Implementation Plans   | CNL(08)10<br>CNL(08)11                       |
| (b) Questions to the Parties from the Second <i>Ad Hoc</i> Review Group on the Focus Area Reports on Management of Salmon Fisheries                      | CNL(08)12<br>CNL(08)13                       |
| (a) Presentations by the Parties and Jurisdictions on their Focus Area Reports on Management of Salmon Fisheries and responses to Review Group questions |  |

- 6.2 Decisions by the Council in the light of the 'Next Steps for NASCO's Special Session
- 6.3 Progress in implementing a Public Relations Strategy CNL(08)14
- 6.4 Performance Review of the Work of NASCO
- 7. Conservation, Restoration, Enhancement and Rational Management of Atlantic Salmon under the Precautionary Approach**
  - 7.1 Annual Reports on Implementation Plans CNL(08)15
  - 7.2 Aquaculture, Introductions and Transfers, and Transgenics
    - (a) The Williamsburg Resolution
    - (b) Liaison with the Salmon Farming Industry CNL(08)16
  - 7.3 New or Emerging Opportunities for, or Threats to, Salmon Conservation and Management
  - 7.4 Report of the Working Group on Socio-Economics CNL(08)17
  - 7.5 Progress with the Development of the Database of Salmon Rivers CNL(08)18
  - 7.6 St Pierre and Miquelon Salmon Fishery CNL(08)19
  - 7.7 Impacts of Acid Rain on Atlantic Salmon
  - 7.8 Reports on the Work of the Three Regional Commissions
- 8. Other Business**
- 9. Date and Place of Next Meeting**
- 10. Report of the Meeting**
- 11. Press Release**



**CNL(08)27**  
***North Atlantic Salmon Conservation Organization***  
***2009 Budget and 2010 Forecast Budget (Pounds Sterling)***

| Section | Description                                 | Expenditure    |                  |
|---------|---|----------------|------------------|
|         |   | Budget<br>2009 | Forecast<br>2010 |
| 1       | Staff-related costs                         | 351,840        | 362,200          |
| 2       | Travel and subsistence                      | 44,500         | 45,400           |
| 3       | Research and advice                         | 53,440         | 55,000           |
| 4       | Contribution to Working Capital Fund        | 40,000         | 40,000           |
| 5       | Meetings                                    | 8,000          | 8,000            |
| 6       | Office supplies, printing and translation   | 25,250         | 25,900           |
| 7       | Communications                              | 28,000         | 28,640           |
| 8       | Headquarters Property                       | 37,300         | 38,400           |
| 9       | Office furniture and equipment              | 6,500          | 6,500            |
| 10      | Audit and other expenses                    | 10,000         | 10,210           |
| 11      | Tag Return Incentive Scheme                 | 4,200          | 4,500            |
| 12      | International Atlantic Salmon Research Fund | 0              | 0                |
| 13      | Contribution to Contractual Obligation Fund | 36,000         | 37,000           |
|         | Total                                       | 645,030        | 661,750          |
|         |   | Income         |                  |
|         |   | Budget<br>2009 | Forecast<br>2010 |
| 14      | Contributions - Contracting Parties         | 580,030        | 598,750          |
| 15      | General Fund - Interest                     | 8,000          | 8,000            |
| 16      | Income from Headquarters Property           | 57,000         | 55,000           |
| 17      | Surplus or Deficit (-) from 2007            | 0              | 0                |
|         | Total                                       | 645,030        | 661,750          |

**Adjustments to 2008 contributions (Pounds Sterling)**

**to take into account confirmed 2006 Catch Statistics**

| Party                                 | 2006<br>Provisional<br>catch | 2006<br>Confirmed<br>catch | 2008<br>Contribution<br>based on<br>provisional<br>catch | 2008<br>Contribution<br>based on<br>confirmed<br>catch | Adjustment<br>to 2008<br>contribution |
|---------------------------------------|------------------------------|----------------------------|--|--|---------------------------------------|
| Canada                                | 132                          | 137                        | 51,942   | 52,521   | +580                                  |
| Denmark (Faroe Islands and Greenland) | 23                           | 23                         | 29,654   | 29,579   | -74                                   |
| European Union                        | 703                          | 729                        | 168,699  | 171,660  | +2,961                                |
| Iceland                               | 113                          | 114                        | 48,057   | 47,893   | -164                                  |
| Norway                                | 931                          | 931                        | 215,320  | 212,312  | -3,008                                |
| Russian Federation                    | 91                           | 91                         | 43,558   | 43,264   | -294                                  |
| USA                                   | 0                            | 0                          | 24,951   | 24,951   | 0                                     |
| <b>TOTAL</b>                          | <b>1,993</b>                 | <b>2,025</b>               | <b>582,180</b>   | <b>582,180</b>   | <b>0</b>                              |

Note: A positive adjustment represents an underpayment in 2008.

**NASCO Budget Contributions for 2009 and Forecast  
Budget Contributions for 2010 (Pounds Sterling)**

| Party                                 | 2007<br>Provisional<br>catch<br>(tonnes) | Contribution<br>for 2009 | Adjustment<br>from 2008 | Adjusted<br>contribution<br>for 2009 | Forecast<br>contribution<br>for 2010 |
|---------------------------------------|--|--------------------------|-------------------------|--------------------------------------|--------------------------------------|
| Canada                                | 112                                      | 54,580                   | +580                    | 55,160                               | 56,342                               |
| Denmark (Faroe Islands and Greenland) | 25                                       | 31,493                   | -74                     | 31,418                               | 32,509                               |
| European Union                        | 441                                      | 141,888                  | +2,961                  | 144,849                              | 146,467                              |
| Iceland                               | 122                                      | 57,234                   | -164                    | 57,070                               | 59,081                               |
| Norway                                | 767                                      | 228,400                  | -3,008                  | 225,391                              | 235,771                              |
| Russian Federation                    | 63                                       | 41,577                   | -294                    | 41,283                               | 42,919                               |
| USA                                   | 0  | 24,858                   | 0                       | 24,858                               | 25,661                               |
| <b>TOTAL</b>                          | <b>1,530</b>                             | <b>580,030</b>           | <b>0</b>                | <b>580,030</b>                       | <b>598,750</b>                       |

Column totals can be in error by a few pounds due to rounding.

**Council**

**CNL(08)7**

***Report of the ICES Advisory Committee***

*(Sections 1, 2 and 6 only)*

Only the advice concerning general issues of relevance to the North Atlantic is given in this report. The detailed advice on a Commission area basis is annexed to the report of the Commissions.



## 1 Introduction

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### 1.1 Main tasks

At its 2007 Statutory Meeting, ICES resolved (C. Res. 2007/2/ACOM18) that the Working Group on North Atlantic Salmon [WGNAS] (Chair: T. Sheehan, USA) will meet in Galway, Ireland, from the 1st–10th April 2008 to consider questions posed to ICES by the North Atlantic Salmon Conservation Organisation (NASCO). The terms of reference were met and the sections of the report which provide the answers are identified below:

| <b>With respect to Atlantic salmon in the North Atlantic Area:</b>   | <b>Section 2</b>  |
|--|-------------------|
| provide an overview of salmon catches and landings, including unreported catches by country and catch-and-release, and production of farmed and ranched Atlantic salmon in 2007;   | 2.1 and 2.2       |
| report on significant new or emerging threats to, or opportunities for, salmon conservation and management;  | 2.3 and 2.7       |
| examine and report on associations between changes in biological characteristics of all life stages of Atlantic salmon, environmental changes and variations in marine survival with a view to identifying predictors of abundance; <sup>1</sup>   | 2.4               |
| describe the natural range of variability in marine survival with particular emphasis on partitioning mortality to the narrowest geographic scale possible (estuarine, near-shore, offshore, etc.); <sup>2</sup>   | 2.5               |
| compile information on the marine migration and dispersal of escaped farmed salmon with particular emphasis on movements between countries; <sup>3</sup>   | 2.6               |
| provide a compilation of tag releases by country in 2007 and advise on progress with compiling historical tag recovery data from oceanic areas; <sup>4</sup>   | 2.8               |
| identify relevant data deficiencies, monitoring needs and research requirements; <sup>5</sup>  | Sec 6             |
| <b>With respect to Atlantic salmon in the North-East Atlantic Commission area:</b>   | <b>Section 3</b>  |
| 1 ) describe the key events of the 2007 fisheries; <sup>6</sup>  | 3.8               |
| provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;  | 3.9               |
| review and report on the development of age-specific stock conservation limits, where possible based upon individual river stocks;   | 3.3               |
| describe the status of the stocks and provide annual catch options or alternative management advice for 2009-2011, if possible based on forecasts of PFA for northern and southern stocks, with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding; <sup>7</sup> | 3.4, 3.6, and 3.8 |
| further develop methods to forecast PFA for northern and southern stocks with measures of uncertainty.   | 2.3.2 and 2.3.3   |

|  |                  |
|--|------------------|
| <b>With respect to Atlantic salmon in the North American Commission area:</b>  | <b>Section 4</b> |
| 2 ) describe the key events of the 2007 fisheries (including the fishery at St Pierre and Miquelon); <sup>6</sup>  | 4.2              |
| report on the biological characteristics (size, age, origin) of the catch in coastal fisheries and potential impacts on non-local salmon stocks;   | 4.2.4            |
| provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;  | 4.3              |
| update age-specific stock conservation limits based on new information as available;   | 4.1              |
| In the event that NASCO informs ICES that the framework (FWI) indicates that re-assessment is required*: describe the status of the stocks and provide annual catch options or alternative management advice for 2008-2011 with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding; <sup>7</sup> | na               |

|  |                  |
|--|------------------|
| <b>With respect to Atlantic salmon in the West Greenland Commission area:</b>  | <b>Section 5</b> |
| 3 ) describe the key events of the 2007 fisheries; <sup>6</sup>  | 5.1              |
| provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;  | 5.2              |
| In the event that NASCO informs ICES that the framework (FWI) indicates that re-assessment is required: describe the status of stocks and provide annual catch options or alternative management advice for 2008-2010 with an assessment of risk relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding. <sup>7,8</sup> | na               |

**Notes:**

1. *With regard to question 1.3, there is interest in determining whether declines in marine survival coincide with changes in the biological characteristics of juveniles in fresh water or whether they are modifying characteristics of adult fish (size at age, age at maturity, condition, sex ratio, growth rates, etc.) and with environmental changes. In the event that an annual measure is agreed for the West Greenland fishery, this question should be considered a lower priority than the other questions.*
2. *With regard to question 1.4, there is interest in determining the extent to which marine survival regimes are driven by factors in estuarine, nearshore, or offshore environments. To the extent possible, this assessment should focus on discrete stock complexes corresponding to NASCO management objectives. Characterizing these losses could provide regional and stock-specific context for ongoing research and upcoming research initiatives such as SALSEA.*
3. *A number of implementation plans presented by NASCO Parties raised concern about the occurrence in their marine fisheries and rivers of farmed salmon originating in other countries.*
4. *With regard to question 1.6 the data on tag recovery information should be compiled according to the format developed by the ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas.*
5. *NASCO's International Atlantic Salmon Research Board's inventory of on-going research relating to salmon mortality in the sea will be provided to ICES to assist it in this task.*

6. *In the responses to questions 2.1, 3.1 and 4.1 ICES is asked to provide details of catch, gear, effort, composition and origin of the catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Any new information on non-catch fishing mortality, of the salmon gear used, and on the bycatch of other species in salmon gear, and on the bycatch of salmon in any existing and new fisheries for other species is also requested.*
7. *In response to questions 2.4, 3.5 and 4.3 provide a detailed explanation and critical examination of any changes to the models used to provide catch advice.*
8. *In response to question 4.3, ICES is requested to provide a brief summary of the status of North American and North-East Atlantic salmon stocks. The detailed information on the status of these stocks should be provided in response to questions 2.4 and 3.5.*

**\* NASCO should inform ICES by 31 January 2008 of the outcome of utilising the Framework of Indicators (FWI).**

At the 2006 Annual Meeting of NASCO, conditional multi-annual regulatory measures were agreed to in the West Greenland Commission and for the Faroe Islands in the Northeast Atlantic Commission. The measures were conditional on a Framework of Indicators (FWI) being provided by ICES and the acceptance of the FWI by the various parties of each commission (WGC(06)06, NEA(06)06). The FWI was delivered by ICES (ICES, 2007c) and was accepted by the Parties to the West Greenland Commission. As such, the multi-annual regulatory measures for the WGC continued and the decision to request that ICES undertake a full stock assessment and provide multi-annual catch advice for the 2008 fishing season was dependant on the outcome of the FWI. Denmark (in respect of the Faroe Islands and Greenland) opted out of the multi-annual regulatory measures as a FWI was not provided by ICES for the fishery in the Faroes (ICES, 2007c).

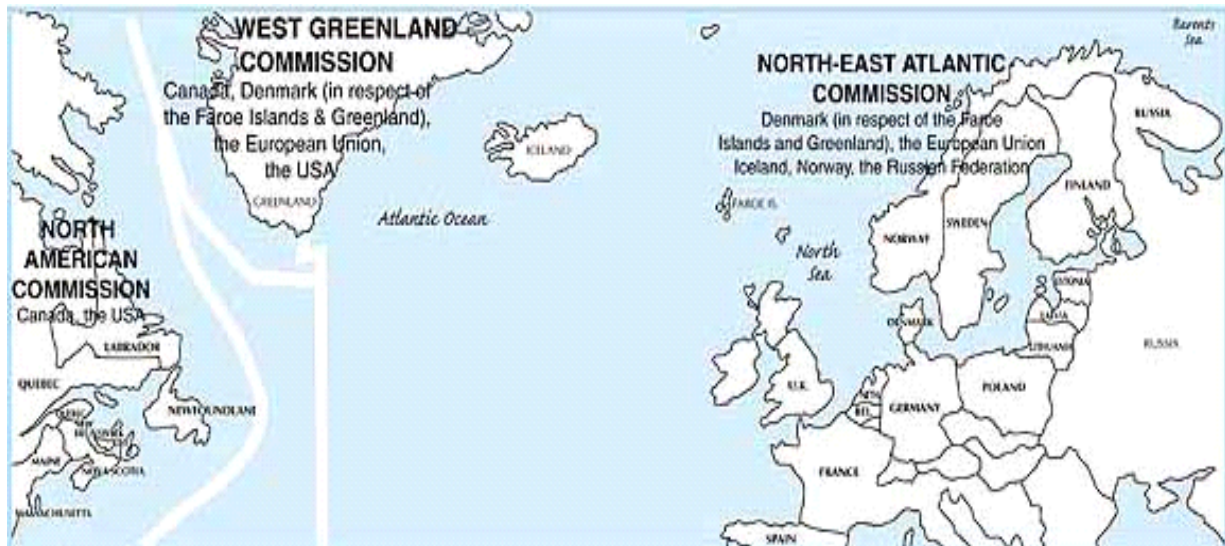
NASCO formed the West Greenland Framework of Indicators Coordination Group which applied the FWI and communicated the results that no change to the management advice previously provided by ICES is required for the 2008 fishery at West Greenland. NASCO communicated this outcome to ICES on February 1, 2008 via email with a copy to the Chair of the WGNAS. As a result, terms of reference c5 and d3 were not undertaken by the WGNAS.

A complete list of acronyms used in this document is provided in Annex 1. References are cited in Annex 2.

## **1.2 Management framework for salmon in the North Atlantic**

The advice generated by ICES is in response to terms of reference posed by the North Atlantic Salmon Conservation Organisation (NASCO), pursuant to its role in international management of salmon. NASCO was set up in 1984 by international convention (the Convention for the Conservation of Salmon in the North Atlantic Ocean), with a responsibility for the conservation, restoration, enhancement, and rational management of wild salmon in the North Atlantic. While sovereign states retain their role in the regulation of salmon fisheries for salmon originating from their own rivers, distant water salmon fisheries, such as those at Greenland and Faroes, taking salmon originating from rivers of another Party, are regulated by NASCO under the terms of the Convention. NASCO now has seven Parties that are signatories to the Convention, including the EU which represents its Member States.

**NASCO discharges these responsibilities via the three Commission areas shown below:**



### 1.3 Management objectives

NASCO has identified the primary management objective of that organisation as:

“To contribute through consultation and co-operation to the conservation, restoration, enhancement and rational management of salmon stocks taking into account the best scientific advice available”.

NASCO further stated that “the Agreement on the Adoption of a Precautionary Approach states that an objective for the management of salmon fisheries is to provide the diversity and abundance of salmon stocks” and NASCO’s Standing Committee on the Precautionary Approach interpreted this as being “to maintain both the productive capacity and diversity of salmon stocks” (NASCO, 1998).

NASCO’s Action Plan for Application of the Precautionary Approach (NASCO, 1999) provides interpretation of how this is to be achieved, as follows:

“Management measures should be aimed at maintaining all stocks above their conservation limits by the use of management targets”.

Socio-economic factors could be taken into account in applying the Precautionary Approach to fisheries management issues”:

“The precautionary approach is an integrated approach that requires, inter alia, that stock rebuilding programmes (including as appropriate, habitat improvements, stock enhancement, and fishery management actions) be developed for stocks that are below conservation limits”.

### 1.4 Reference points and application of precaution

Conservation limits (CLs) for North Atlantic salmon stock complexes have been defined by ICES as the level of stock (number of spawners) that will achieve long-term average maximum sustainable yield (MSY). In many regions of North America, the CLs are calculated as the number of spawners required to fully seed the wetted area of the river. In some regions of Europe, pseudo stock–recruitment observations are used to calculate a hockey stick relationship, with the inflection point defining the CLs. In the remaining regions, the CLs are calculated as the number of spawners that will achieve long-term average maximum sustainable yield (MSY), as derived from the adult-to-adult



stock and recruitment relationship (Ricker, 1975; ICES, 1993). NASCO has adopted the region-specific CLs (NASCO, 1998). These CLs are limit reference points ( $S_{lim}$ ); having populations fall below these limits should be avoided with high probability.

Management targets have not yet been defined for all North Atlantic salmon stocks. When these have been defined they will play an important role in ICES advice.

For the assessment of the status of stocks and advice on management of national components and geographical groupings of the stock complexes in the NEAC area, where there are no specific management objectives:

ICES requires that the lower boundary of the 95% confidence interval of the current estimate of spawners is above the CL for the stock to be considered at full reproductive capacity.

When the lower boundary of the confidence limit is below the CL, but the midpoint is above, then ICES considers the stock to be at risk of suffering reduced reproductive capacity.

Finally, when the midpoint is below the CL, ICES considers the stock to suffer reduced reproductive capacity.

It should be noted that this is equivalent to the ICES precautionary target reference points ( $S_{pa}$ ). Therefore, stocks are regarded by ICES as being at full reproductive capacity only if they are above the precautionary target reference point. This approach parallels the use of precautionary reference points used for the provision of catch advice for other fish stocks in the ICES area.

For catch advice on fish exploited at West Greenland (non-maturing 1SW fish from North America and non-maturing 1SW fish from Southern NEAC), ICES has adopted a risk level of 75% (ICES, 2003) as part of an agreed management plan. ICES applies the same level of risk aversion for catch advice for homewater fisheries on the North American stock complex.

## 2 Atlantic salmon in the North Atlantic area

### 2.1 Catches of North Atlantic salmon

#### 2.1.1 Nominal catches of salmon

Nominal catches of salmon reported for countries in the North Atlantic are given in Table 2.1.1.1 for the years 1960 to 2007. These catches (in tonnes) are illustrated in Figure 2.1.1.1 for four North Atlantic regions. Catch statistics in the North Atlantic also include fish farm escapees and in some Northeast Atlantic countries also included ranched fish.

A significant change occurred in 2007 with the reporting of Icelandic catches. Traditionally, they have been split into two separate categories, wild and ranched, reflecting the fact that Iceland has been the only North Atlantic country where large-scale ranching has been undertaken with the specific intention of harvesting all returns at the release site. The release of smolts for commercial ranching purposes ceased in Iceland in 1998, but stocking specifically for rod fisheries in two Icelandic rivers is considered as “ranching” as there are no wild salmon in the target river. This continued in 2007 (Table 2.1.1.1). While ranching does occur in some other countries, this is on a much smaller scale. Some of these operations are experimental and at others harvesting does not occur solely at the release site. The ranched component in these countries has therefore been included in the nominal catch.

Reported catches in tonnes for the three NASCO Commission Areas for 1996–2007 are provided below.

| AREA  | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------|------|------|------|------|------|------|------|------|------|------|
| NEAC  | 2225 | 2073 | 2736 | 2876 | 2495 | 2303 | 1977 | 1999 | 1878 | 1394 |
| NAC   | 159  | 154  | 155  | 150  | 150  | 144  | 164  | 142  | 140  | 114  |
| WGC   | 11   | 19   | 21   | 43   | 9    | 9    | 15   | 15   | 22   | 25   |
| Total | 2396 | 2246 | 2913 | 3069 | 2654 | 2456 | 2156 | 2155 | 2040 | 1533 |

The provisional total nominal catch for 2007 was 1533 t, 507 t below the updated catch for 2006 (2040 t) and the lowest in the period 1960–2007. Catches were below the previous five- and ten-year averages in most countries, and were the lowest recorded in the time-series in six countries, four of these in Southern NEAC.

ICES recognises that mixed-stock fisheries present particular threats to stock status. These fisheries predominantly operate in coastal areas and NASCO specifically requests that the nominal catches in homewater fisheries be partitioned according to whether the catch is taken in coastal, estuarine, or riverine areas. The 2007 nominal catch (in tonnes) was partitioned accordingly and is shown below for the NEAC and NAC Commission Areas. It was not possible to apportion the small Danish catches in 2007 and therefore these have been excluded from the calculation. The catch accounted for by each fishery varied considerably between countries. In total, coastal fisheries accounted for 38% of the catches in Northeast Atlantic countries compared to 7% in North America, whereas in-river fisheries took 58% of the catches in Northeast Atlantic countries and 62% in North America. In most countries the majority of the catch is now taken in fresh water and the coastal catch has declined markedly.

| AREA | COAST  |    | ESTUARY |    | RIVER  |    | TOTAL  |
|------|--------|----|---------|----|--------|----|--------|
|      | Weight | %  | Weight  | %  | Weight | %  | Weight |
| NEAC | 533    | 38 | 56      | 4  | 802    | 58 | 1391   |
| NAC  | 8      | 7  | 36      | 31 | 70     | 62 | 114    |

In the NEAC Northern area, catches since 1995 have fluctuated with no apparent trend (Figure 2.1.1.2). Typically about half the catch has been taken in rivers and half in coastal waters (although there are no coastal fisheries in Iceland and Finland), with estuarine catches representing a negligible component of the catch in this area. In Southern Europe, catches in all fishery areas have declined over the period and, while coastal fisheries have historically made up the largest component of the catch, these fisheries have declined substantially, reflecting widespread measures to reduce exploitation in a number of countries. In 2007, the majority of the catch in this area was taken in fresh water. In North America, the total catch over the period 2000–2007 has been relatively constant. The majority of the catch in this area has been taken in riverine fisheries, while the catch in coastal fisheries has been relatively small in any year (11 t or less).

### 2.1.2 Catch-and-release

The practice of catch-and-release in rod fisheries has become increasingly common as a salmon management/conservation measure in light of the widespread decline in salmon abundance in the North Atlantic. In some areas of North America, catch-and-release has been practiced since 1984, and in more recent years it has also been widely used in many European countries both as a result of statutory regulation and through voluntary practice. There are large differences in the percentage of the total rod catch that is released: in 2007 this ranged from 19% in UK (N. Ireland) to 90% in Russia, reflecting varying management practices and angler attitudes. Within countries, the percentage of fish released has tended to increase over time. Overall, over 178 500 salmon were reported to have been released around the North Atlantic in 2007, almost 11 000 more than in 2006. There is also evidence from some countries that larger MSW fish are released in higher proportions than smaller MSW fish.

### 2.1.3 Unreported catches

The total unreported catch in NASCO areas in 2007 was estimated to be 475 t. The unreported catch in the North East Atlantic Commission Area in 2007 was estimated at 465 t and that for the West Greenland Commission Area at 10 t. There was no estimate for the North American Commission Area (Table 2.1.1.1). The unreported catch, expressed as a percentage of the total North Atlantic catch (nominal and unreported), has fluctuated since 1987 (range 23–34%), but has remained fairly constant in the last three years at about 25%. Over recent years, efforts have been made to reduce the level of unreporting in a number of countries (e.g. through improved reporting procedures, carcase tagging, and logbook schemes). After 1994 there are no available data on the extent of possible salmon catches in international waters. Limited surveillance flights, which formed the basis of past estimates of catches in international waters, have not reported any such salmon fishing in recent years. Estimates (in tonnes) of unreported catches for the three Commission Areas for the period 1996–2007 are given below:

| AREA          | 1998          | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---------------|---------------|------|------|------|------|------|------|------|------|------|
| NEAC          | 1108          | 887  | 1135 | 1089 | 946  | 719  | 575  | 605  | 604  | 465  |
| NAC           | 91            | 133  | 124  | 81   | 83   | 118  | 101  | 85   | 56   | -    |
| WGC           | 11            | 13   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   |
| Int'l. waters | Not available |      |      |      |      |      |      |      |      |      |

Expressed as a percentage of the total North Atlantic catch, unreported catch estimates range from 0% to 15% for individual countries. However, it should be noted that methods of estimating unreported

catch vary both within and among countries. The non-reporting rates range from 1% to 50% of the total national catch in individual countries.

## **2.2 Farming and sea ranching of Atlantic salmon**

The provisional estimate of farmed Atlantic salmon production in the North Atlantic area for 2007 is 947 000 t. This represents an increase from 2006 (839 912 t) and is the highest in the time-series. Most of the North Atlantic production took place in Norway (73%) and UK (Scotland) (17%).

World-wide production of farmed Atlantic salmon has been in excess of one million tonnes since 2002. It is difficult to source reliable production figures for all countries outside the North Atlantic area and it has been necessary to use 2006 estimates for some countries in deriving a world-wide estimate for 2007. Noting this caveat, total production in 2007 is provisionally estimated at around 1 400 000 t (Figure 2.2.1) a 7% increase on 2006 and the highest in the time-series. Production outside the North Atlantic is dominated by Chile and is estimated to have accounted for 32% of the total in 2007. World-wide production of farmed Atlantic salmon in 2007 was over 900 times the reported nominal catch of Atlantic salmon in the North Atlantic.

The total harvest of ranched Atlantic salmon in countries bordering the North Atlantic in 2007 was 39 t, the majority of which (35 t) was taken in Icelandic “ranched” rod fisheries (Figure 2.2.2). Small catches of ranched fish were also recorded in three other countries (Ireland, UK (N. Ireland), and Norway); the data includes catches in net, trap, and rod fisheries.

## **2.3 NASCO has asked ICES to report on significant, new or emerging threats to, or opportunities for, salmon conservation and management**

### **2.3.1 Stock–recruitment models and developing conservation limits for Atlantic salmon populations in Norway**

Conservation limits (CLs) have been developed for Atlantic salmon stocks in nine rivers in Norway which have sufficient data to fit stock–recruitment (SR) models. In these models, spawning stock and recruitment were measured as the number of eggs ( $S$ ) and the density of juveniles ( $R$ ), respectively. Based on the SR-relationships in these nine rivers, CLs for salmon populations in Norway were grouped into four categories of egg densities from  $<1.5$  eggs  $m^{-2}$  to  $>5$  eggs  $m^{-2}$  (group averages being, respectively, 1, 2, 4, and 6 eggs  $m^{-2}$ ). Eighty major Norwegian rivers were then grouped into these four categories.

Wetted area was estimated by GIS methods from digital geographic data to a 1:50 000 scale, calculated from the river mouth to migratory barriers mapped by Norwegian management authorities. For most rivers productivity (i.e. category of egg density) was assessed based on catch statistics converted to catch per area, smolt age distribution, and other available information on the characteristics of each river. The number of eggs necessary to seed the whole river was estimated from the CL (eggs/ $m^2$ ) and the number of females needed to meet that number. For some large watercourses, CLs were estimated by considering the tributaries separately. This must be considered *first-generation* CLs for the populations in question. The two major limitations to setting precise CLs are believed to be the estimation of productive area (as part of the wetted area) and estimation of the number of spawners extrapolated from catch statistics. CLs have been estimated for an additional 100 Norwegian rivers, but have as yet not been published.

### 2.3.2 Standardization of run-reconstruction models for NAC and NEAC areas

Run-reconstruction models are used in both the NAC and NEAC areas to estimate the pre-fishery abundance of 1SW salmon (Potter *et al.*, 1998; Rago *et al.*, 1993). The models work backwards from catches in homewaters or returns to rivers and progressively add in catches in the ocean at earlier periods of time, with adjustments for natural mortality, to develop estimates of abundance at a given point in the life cycle at sea prior to fisheries exploitation. In the interest of exploring Bayesian models for forecasting and for development of catch advice, the assumptions and data inputs of the run-reconstruction models were reviewed and differences in assumptions and data inputs between Commission areas were identified. The development of a standardized approach for the run-reconstruction models for each Commission will be pursued.

### 2.3.3 Modelling dynamics of Atlantic salmon in the NAC and NEAC areas

Forecast models and catch advice frameworks have not been developed for three of the four NEAC stock complexes, all of which were exploited in the Faroes fishery. For the provision of the catch advice for West Greenland, two forecast models are used in the risk analysis; one for the non-maturing 1SW salmon of North American origin, the other for 1SW non-maturing salmon from the southern NEAC complex. Both models are based on similar data, including a lagged spawner (LS) variable to define the spawning stock, and a recruitment variable termed the PFA (Pre-Fishery Abundance) with a function relating the spawning component to the recruitment.

The estimation of abundance prior to the fishery (PFA) is done using the run-reconstruction model developed by Rago *et al.* (1993) and Potter *et al.* (1998). A preliminary plot of the annual midpoint estimates of PFA relative to the LS for the southern NEAC non-maturing complex suggests two periods of productivity as noted for NAC: a high productivity period during 1979 to 1989 and a low productivity period during 1978 and 1990 to the present (Figure 2.3.3.1). For NAC, a series of models have been used to relate PFA to LS and to assess the presence of two phases of productivity. For the southern NEAC non-maturing 1SW complex, the WGNAS considered the development of a non-phase shift model to forecast the PFA (ICES, 2002, 2003).

#### Alternate models for NAC and NEAC

A number of functional relationships between PFA and spawners were explored:

- a) a simple random walk through time (dynamic model of Prévost *et al.*, 2005);
- b) a random shift with 2 production levels, but with autocorrelation regarding the probability of being in a high state or a lower state.

The phase shift model is slightly more optimistic for future PFA abundance for both NAC and NEAC, with no chance of further declines, whereas the dynamic model forecasts have greater uncertainty over the 4 years of forecast with increasing chance of further declines in the future.

The parallel declines in productivity for both the NAC and NEAC stock complexes during 1988 to 1993 are striking (Figure 2.3.3.1). The productivity parameter in the models explored does not allow a determination of whether the change in productivity has occurred in fresh water, in the first year at sea survival, or both.

Modelling under a Bayesian framework can include observation errors and should be considered as a next step. This will take into consideration the fact that both PFA and LS are estimated from a number of other data sources, each of which has associated uncertainties. To use these models in a catch

advice framework, disaggregated data for PFA reconstruction must be used. Examples of such model structures were considered by ICES and will be further explored in the future.

#### **2.3.4 Thermal habitat and depths experienced by Atlantic salmon kelts migrating from Newfoundland**

In 2007, data storage tags (DSTs-LAT2510, manufactured by LOTEK Inc.) in a beta test format were applied to 26 Atlantic salmon kelts at an enumeration facility at Campbellton River, Newfoundland. The tags recorded date, time of day, internal and external temperatures, pressure, and light at four-minute intervals. The recording of light made estimation of geolocation possible. The time between release and recovery for 8 fish ranged from 45 to 81 days. Results from these eight recovered tags indicated considerable differences between external and internal temperatures. These differences occurred because the internally placed thermistor was insulated by the flesh of the fish surrounding the body cavity, whereas the external thermistor directly recorded the water temperature in the ocean where the fish was swimming. Depth profiles indicated that during the day salmon were frequently diving, possibly to feed on deeper occurring pelagic species, whereas at night they remained near the surface. Salmon in fresh water are visual feeders and if visual feeding carries over into the sea it would explain the observations of the frequent diving activities during the daylight hours, but little or no activity at night.

Light levels were used to determine daily times of sunrise, sunset, and day length, which were then used to determine latitude and longitude of the salmon. Preliminary results for the eight Campbellton River salmon indicate movement within Notre Dame Bay and in some cases out to 200 km into the Labrador Sea.

#### **2.3.5 Stock size, catch, and effort in the salmon fishery in the River Ellidaar, SW Iceland**

A study using fish counter information, rod catch data from logbooks, and effort data in the period 1935–2002 in River Ellidaar, Southwest Iceland showed high correlation between salmon run and catch ( $R^2=0.68$ ;  $p<0.001$ ). In the 68-year period, the catch varied from 414 to 2276 fish and the salmon run from 750 to 7184 fish (Figure 2.3.5.1) with an average exploitation rate of 40%. The fishing effort increased periodically from 180 rod/days in the beginning of the period to 520 in the latest years. There was a higher exploitation in the years when the run was low than when the run size was high as reflected in higher average number of fish caught per rod-day. With an increased number of rods, the catch per rod-day decreased, indicating that the rod catch reflected the salmon run at least within the observed effort range. There was no relationship between the number of rods used and the exploitation rate although the number of rods increased from 180 to 520 over the 68 years of the time-series. This suggests that within this range the exploitation rate is not sensitive to changes in number of rod-days. Based on this analysis, if the catch is to be reduced as a management measure, it would be necessary to decrease the numbers of rod-days to lower levels than the range already observed to reduce the exploitation rate significantly. However, other management measures such as shortening of the fishing season, closure of areas for fishing, or catch-and-release in the rod fishery may be more effective in this regard.

#### **2.3.6 The assessment of recent fishery management measures on salmon stocks in the River Bush and in UK (N. Ireland) with regard to adjacent regions**

The River Bush represents the main indicator stock for monitoring Atlantic salmon populations in UK (N. Ireland) and long-term assessment work includes a CWT (coded wire tag) programme to examine exploitation and marine survival levels. Commercial catch information and CWT data were used to investigate the impact of a recent fishery management measure (voluntary net buyout) implemented in the Fisheries Conservancy Board area (FCB) of UK (N. Ireland) in 2002. The buyout resulted in a

reduction in landings from a relatively stable mean of 10 263 salmon of all sea ages (1990–2001) to around 2826 fish (2002–07). This represents a mean reduction in landings of approximately 72.5%, or 7 437 fish. In addition, CWT data indicated reduced exploitation rates on 1SW R. Bush salmon in the FCB area following the buyout, with mean exploitation rates for the same period decreasing from around 43% to less than 17%. The potential impact of the FCB area buyout on the 1SW R. Bush stock was assessed by comparing the actual exploitation level as measured by annual microtag returns with the mean pre-buyout exploitation level for the fishery applied to the annual number of available R. Bush grilse returning to the coast. The estimated number of 1SW R. Bush salmon conserved by the measure averaged 460 fish per year (2002–2007) or approximately 42% of the R. Bush CL.

### **2.3.7 Red vent syndrome**

For some countries in the NEAC area, salmon have been returning to rivers with swollen and/or bleeding vents. The condition, referred to as red vent syndrome, appears to be restricted to wild Atlantic salmon populations and has been noted since 2005. However, the condition has become more prevalent and, in 2007, was reported from a number of NEAC countries including Ireland, Iceland, UK (Scotland), UK (England & Wales), and UK (N. Ireland). The cause of the condition has been linked to the presence of a nematode worm, *Anisakis simplex*. This is a common parasite of marine fish and is also found in anadromous species. Its life cycle may include more than one intermediary host with the final host being cetaceans. Man is reported as an accidental host, following ingestion of larvae in raw or undercooked fish (Gómez *et al.*, 2003) and press releases and information leaflets have been issued in a number of NEAC countries to advise anglers. The majority of fish showing symptoms are grilse, although smaller numbers of 2SW fish have also been found with the condition. In UK (N. Ireland), 50% to 60% of early run fish on the River Bush were affected. Both male and female adult salmon are affected; the problem has not been seen in parr or smolts. It is also unclear whether the condition affects the survival of the fish or their spawning success. However, there was no significant difference in the condition factor of affected and unaffected fish from monitored rivers in UK (England & Wales) and affected fish have also been successfully used as broodstock in a number of countries and stripped eggs have developed normally in hatcheries. In addition, an affected salmon tagged on the River Dee in UK (England & Wales) in 2006 was recaptured in spring 2007 as a kelt. The fish appeared to have spawned successfully.

### **2.3.8 Atlantic salmon stock assessment using DIDSON (Dual-Frequency Identification Sonar)**

Dual-Frequency Identification Sonar (DIDSON), which uses acoustic lens technology to form acoustic images of near video quality, is being employed on several north Atlantic rivers to count salmon. Two specific projects have recently been initiated in Ireland and Canada to examine the application of this technology for counting salmon particularly in large rivers where other counting technologies (resistivity, infra-red and split-beam acoustic) are not suitable or effective. The Deel River is the largest tributary of the Moy catchment (Co. Mayo, Ireland), a large catchment area of 2108 km<sup>2</sup>, with prolific salmon run (rod catches of 10 000 to 15 000 salmon/year) and good water quality. For similar reasons the Eagle River (Labrador, Canada) was chosen: catchment 10 824 km<sup>2</sup>; potential production 35 000 adults/year.

### **2.3.9 Smolt migration on the River Rhine**

The downstream migration of Atlantic salmon smolts was monitored in the River Rhine in 2007 using the NEDAP Trail system (Breukelaar *et al.*, 1998). The NEDAP trail system is based on inductive coupling between an antenna loop on the river bottom and a ferrite rod antenna within the transponder tags in the fish. When the fish passes each detection station the unique ID-number of the transponder is recorded. Overall, 78 tagged fish were released into one tributary of the River Rhine about 330 km from the sea. The tagged fish were detected by fixed antenna arrays when leaving the

tributary and during their migration through the Rhine Delta to the sea. By the end of the migration period, 60 of the tagged fish (77%) were detected leaving the tributary and 36 (46%) were recorded reaching the sea after passage through the Rhine Delta. The losses of tagged fish occurred in both the German part of the Rhine (14 fish, 18%) and in the Delta itself in the Netherlands (10 fish, 13%). The study will be repeated after the re-opening of the Haringvliet dam, which is scheduled to occur by the end of 2008, and which is intended to facilitate passage of diadromous migratory fish species.

#### **2.3.10 European regulations**

The EU data collection regulation (EU DCR) has been updated and expanded recently to include both salmon and eels. This will have impacts at Community level relating specifically to the requirement for a multi-annual Community programme for collection, management and use of biological, technical, environmental, and socio-economic data concerning:

commercial fisheries carried out by Community fishing vessels:

- within Community waters, including commercial fisheries for eels and salmon in inland waters,
- outside Community waters;

recreational fisheries carried out within Community waters including recreational fisheries for eels and salmon in inland waters;

aquaculture activities related to marine species, including eels and salmon, carried out within the Member States and the Community waters;

industries processing fisheries products; shall be defined in accordance with the procedure referred to in Article 27(2).



## **2.4 NASCO has asked ICES to examine and report on associations between changes in biological characteristics of all life stages of Atlantic salmon, environmental changes and variations in marine survival with a view to identifying predictors of abundance**

### **2.4.1 Biological characteristics of salmon across the North Atlantic area**

The purpose of examining these associations was to determine whether declines in marine survival coincide with changes in the biological characteristics of juveniles in fresh water or whether they are related to characteristics of adult fish (size-at-age, age-at-maturity, condition, sex ratio, growth rates, etc.). Data were made available for six rivers from the Northern NEAC, seven rivers from the Southern NEAC, and seven from the NAC area. The data set includes information on time-series of variations in mean smolt age, proportions of maiden sea age groups, repeat spawners, sexes, and size-at-age of adult salmon. Preliminary analyses suggest a tentative association between the productivity index (PFA/lagged eggs) and the size of 1SW salmon in the Northern NEAC area, whereas the relationship was less clear for the Southern NEAC area (Figure 2.4.1.2). These preliminary results further suggest that associations between variations in marine survival and biological characteristics of salmon should be examined in more detail.

### **2.4.2 Size of 1SW fish returning to Norway**

In 2007, the size of grilse from all parts of Norway was very small, and the number of grilse returning to Norwegian home waters was very low. The proportion of grilse among salmon smaller than 3 kg was the lowest in the time-series, thus the use of catch statistics to assess the grilse returns for 2007 may overestimate the returns of grilse and underestimate the number of MSW salmon. The mean weight of grilse in samples from Norwegian rivers decreased during the 1990s, increased around 2000, and has recently decreased again in more recent years (Figure 2.4.2.1). The mean grilse weight in 2007 was the lowest in the time-series. The pattern in the 1990s is mainly driven by data from river populations in the central and northern parts of Norway, while the decrease since 2000 is mainly driven by data from populations in the southern part. In all regions of Norway, the mean weight of grilse in 2007 was the lowest in the time-series. The mean standardized weights of grilse in 20 Norwegian rivers correlated positively with the estimated pre-fishery abundance (PFA) of the corresponding sea year class ( $r^2 = 0.72$ ,  $n = 19$  years,  $p < 0.001$ ), and the annual mean weight of salmon smaller than 3 kg from the River Drammen correlated positively with the estimated survival of hatchery-reared smolts released in the same river ( $r^2 = 0.26$ ,  $n = 23$  years,  $p = 0.013$ ). Growth of salmon during the first year at sea or grilse size provides an indirect measure of growth rate, and it may be that growth during the first period at sea is crucial for size-selective mortality. If the conditions that smolts experience during the first period in the sea are important for survival, measurements of circuli spacing on scales during this period may be better correlated with survival than growth during the whole period.

### **2.4.3 Decline in 2SW salmon in Iceland**

In Iceland, a decline in the two-sea-winter (2SW) stock component is of major concern. For rivers with continuous salmon catch records from 1970, and which account for almost 90% of the total national rod catch, it is evident that similar numbers of 1SW and 2SW salmon were caught in the 1970s. However, in the early 1980s a steep decline was observed for all Icelandic salmon stocks. The 1SW fish recovered in the mid-1980s but the 2SW decline still continues (Figure 2.4.3.1). In 2002, voluntary release of rod-caught 2SW salmon and other restrictions on fishing were promoted. As well as the decline in the number of 2SW salmon caught, the average weight of 2SW also shows a declining trend over the same period. No such trends are apparent for the 1SW salmon. The low weight of 2SW salmon suggests poor conditions in the ocean, and that the 1SW and the 2SW salmon are at different

feeding areas. While the 1SW salmon are returning at previous levels, many 2SW fish appear to be dying during their second year at sea. If the decline in the 2SW salmon stock component continues at the current rate, it is predicted that this will be down to very low levels by 2020.

#### **2.4.4 Ecosystem-driven variations in return rates to a second spawning for Atlantic salmon from the Miramichi River**

ICES reviewed an analysis of a 36-year time-series of salmon abundance, demographics and estimates of return rates of post-spawning salmon that explored a possible linkage between survival to a second spawning of Atlantic salmon and changes in the small fish community of the southern Gulf of St. Lawrence. An index of the catchability adjusted biomass of the small fish community (<20 cm length) in the southern Gulf of St. Lawrence was derived from the annual groundfish survey conducted since 1970. Since 1998, the small fish community index, which includes juveniles of many marine fish species such as capelin, smelt, shanny, and stickleback, has increased to the highest levels since the early 1970s.

The improved return rates of consecutive spawners is closely associated with the increase in the biomass index of small fish from the southern Gulf of St. Lawrence (Figure 2.4.4.1). Benoit and Swain (2008) attribute the increase in the small fish index to reduced predation pressure resulting from the collapse of the previously dominant groundfish stocks in this area (cod, skate, flatfish species). This increased biomass of small fish may have benefited salmon by providing a more abundant food source for reconditioning both for consecutive and alternate spawning strategies. The association between the variation in return rate of alternate spawners and the variations in the fish biomass index in either the first post-spawning year at sea or in the return year for alternates provides additional support that food supplies in the early period of return at sea may be beneficial to survival to a second spawning.

#### **2.4.5 West Greenland biological characteristics database, 1968–2007**

Assessment of the effects of the West Greenland salmon fishery on homewater stocks and fisheries requires biological characteristics data from the exploited population as well as estimation of the proportion of the catch that is North American and European in origin. Since about 1965, Canadian, Danish, American, and other researchers have been collecting biological data from catches in the Greenland commercial and local use fisheries at Greenland. The database now consists of 54 095 samples of individual fish with data on date, location of sample (NAFO Division or ICNAF squares), size (mainly fork length measured in cm with some gutted and whole weights in kg), river and sea ages, plus presence of spawning marks and origin. This database is available for use by researchers interested in ecological effects of salmon at sea as well as for modelling population parameters for prediction of numbers of salmon available for harvest.

- **2.5 NASCO has asked ICES to describe the natural range of variability in marine survival with particular emphasis on partitioning mortality to the narrowest geographic scale possible (estuarine, near-shore, offshore, etc.)**

##### **2.5.1 Variability in estuarine and early marine survival of smolts**

ICES reviewed information from studies that have used sonic telemetry to assess the migratory behaviour of smolts in estuaries and the coastal zone to derive estimates of the mortality of smolts and post smolts. These studies were concentrated in the southern portions of Europe and North America, utilized both wild and hatchery smolts, and have been replicated for up to 5 years depending on the individual river. All the investigations provided estimates of smolt survival through estuaries. However, none of the studies in the NEAC area extended beyond the estuary mouth. In contrast, some North American studies have extended into coastal areas and across the Gulf of St. Lawrence. A

summary of these studies, by region, is provided in Table 2.5.1.1. One of the investigations was conducted in an impounded estuary and this accounts for some of the lower observed values of survival through estuaries. Results from these studies suggest that smolt estuary mortality, although variable, is broadly similar in the NEAC and NAC regions, with no clear correlation with latitude (Figure 2.5.1.1). These studies also provided no evidence of either increasing or decreasing trends in survival to estuary exit over the time period in which they have been conducted and there was some indication that higher losses occurred in the longer estuaries (Figure 2.5.1.1), possibly a reflection of greater losses due to predation.

### **2.5.2 Ocean tracking network**

A major Canadian-based initiative, the Ocean Tracking Network (OTN), commenced in 2008 with the aim of deploying sonic receiver arrays at key points in the globe's oceans. Some of these arrays will provide opportunities for long-range tracking of salmon post smolts in the marine environment, and in some instances for quantifying the numbers of post smolts surviving to various stages in their marine migration. In North America, sonic arrays, which will run perpendicular to the coast across the continental shelf, are planned for: the Gulf of Maine (2009) and Halifax, Nova Scotia (starting in April 2008 with completion in 2009), with further arrays across the Cabot Strait in the Gulf of St. Lawrence (2009) and off Greenland (2010). A seasonal receiver line has been deployed since 2006 in the northern exit from the Gulf of St. Lawrence (the Strait of Belle Isle) in early summer to autumn, and funding has been requested for two additional seasonal coastal shelf lines off Labrador (2008). Attempts are currently underway to find support for the establishment of additional arrays in Europe. OTN also aims to foster research and development of innovative technologies and strategies for acoustic telemetry. This includes the development of "bioprobes", where large mobile animals such as sharks or rays will carry receivers capable of downloading information from passing tagged animals, and uploading this via satellite to data compilers when these large animals break the surface. The OTN infrastructure should be maintained for at least a ten-year period, providing a long-term platform for marine work on Atlantic salmon.

### **2.5.3 Sonic tracking of North American Atlantic salmon smolts to sea**

ICES reviewed the progress of one of the North American SALSEA initiatives, a multi-year programme of sonic telemetry of Atlantic salmon (*Salmo salar*) smolts from five Canadian rivers. This programme is documenting the migration patterns and survival of smolts from fresh-water release sites, through home river estuaries and across the Gulf of St. Lawrence to the Strait of Belle Isle (> 1000 km for some fish). The study rivers include four (Restigouche, Miramichi, Cascapedia, and St-Jean (North Shore)) which contain a high proportion of 2SW salmon expected to migrate to West Greenland, and one in Newfoundland (Western Arm Brook) where the vast majority of fish mature after one year at sea. The study rivers lie approximately on a 600 km latitudinal gradient. Survival patterns of smolts were similar among years for a given river, and differed consistently among these study rivers over time. Heavy losses (up to 54%) occurred in most river estuaries, although in the Miramichi and Restigouche estuaries the proportion of smolts surviving estuary transit increased as the smolt run size increased, possibly indicating predator swamping (Figure 2.5.3.1). Travel rates in the Gulf were estimated at 18–25 km d<sup>-1</sup>; survival rates to the Strait of Belle Isle and travel speeds were not associated with fish body size. Significant numbers of smolts from the Miramichi, Restigouche, and Cascapedia rivers passed through the Strait of Belle Isle, showing that this is an important migration pathway for fish from these rivers. The timing of the passage of fish from these rivers through the Strait was synchronized, despite different entry times into the Gulf of St. Lawrence. This may indicate that aggregation of smolts occurs from multiple populations within the first 30 days of entering the sea. These results will be informative when planning North American SALSEA research cruises scheduled for 2008.

## **2.6 NASCO has asked ICES to compile information on the marine migration and dispersal of escaped farmed salmon with particular emphasis on movements between countries**

### **2.6.1 Experimental tagging programme for investigating the behaviour of escaped farmed salmon from Norway and Scotland**

In 2006, Norway and Scotland carried out an experiment releasing individually tagged large farmed salmon from farms on the coast. Farmed Atlantic salmon reared at Ardmail near Ullapool in Scotland and at Rognaldsvåg outside Florø in Norway were individually tagged with external Lea tags and released from the fish farms in the spring of 2006 (Ardmail: 678 with mean length of 719 mm; Rognaldsvåg: 597 with mean length of 721 mm). Most of the salmon were expected to be sexually mature in the autumn of 2006. Five tags from the releases in Scotland (0.7% of the total number released) and 42 tags from the releases in Norway were recovered (7% of the number released). Salmon released from the Norwegian fish farm showed a much higher survival (or detection) rate than the fish released at the Scottish farm and their migration pattern was very local. The migration pattern of the salmon released in Scotland can be plausibly explained by transport with the prevailing west to east Atlantic currents. The study has shown that large salmon escaping from fish farms in Scotland in the spring are capable of reaching Norwegian waters and the west coast of Sweden.

## **2.7 Update on marine research initiatives in the North Atlantic**

### **2.7.1 Irish post-smolt survey in 2007**

In May 2007, the Marine Institute of Ireland, funded under Ireland's National Development Plan (NDP) and the Atlantic Salmon Trust, organised a short, directed exploratory research cruise using a pelagic trawl net designed by Norwegian scientists for post-smolt fishing. Tissue samples of post-smolts captured at sea were provided for genetic analysis. The samples were divided by location resulting in four groups; Galway Bay, Killalla Bay, West Isle of Mull, and North West Isle of Lewis.

A summary of the sample locations and dates is shown in Figure 2.7.1.1. Overall, the majority of captures originated from large river systems in the vicinity of the individual trawling stations or from rivers to the south. However, it should be noted that a number of captures did originate from rivers believed to have migration routes that would likely not take them through these surveyed areas. As an example, of the 8 samples taken in Galway Bay, 2 fish were identified as having originated from rivers that are a considerable distance to the north of the sampling locations, indicating that these smolts had travelled in the opposite direction to that which may have been expected for ocean migrating post-smolts. These post-smolts may possibly have been influenced by local currents or circumstances. These types of results highlight the importance of marine surveys for salmon towards defining migration routes and may prove critical when developing large-scale marine survey programmes under the SALSEA initiative.

### **2.7.2 SALSEA**

In 2006, NASCO adopted the Salmon at Sea ("SALSEA", An International Cooperative Research Programme on Salmon at Sea) conceptual programme of research into the causes of declines in marine survival of Atlantic salmon. The SALSEA programme contains a comprehensive mix of fresh water, estuarine, coastal, and offshore elements, ensuring a comprehensive overview of factors which may affect the marine mortality of Atlantic salmon. SALSEA offers a unique opportunity to increase understanding of how Atlantic salmon use the ocean: where they go; how they use ocean currents and the ocean's food resources; and what factors influence migration and distribution at sea.

In 2007, a significant element of the larger SALSEA project called “SALSEA Merge” (Advancing Understanding of Atlantic Salmon at Sea: Merging Genetics and Ecology to Resolve Stock-specific Migration and Distribution Patterns) was provided with funding support for 2008–2011 from the European Union 7th Framework (FP7), the Atlantic Salmon Trust, and the Total Fund. The overall objective of SALSEA-Merge is, by merging genetic and ecological investigations, to advance understanding of stock-specific migration and distribution patterns and overall ecology of the marine life of Atlantic salmon and to gain insight into the factors resulting in recent significant increases in marine mortality. The project will assemble and analyze data on the oceanographic and biological characteristics of the marine habitat of post-smolts in addition to obtaining biological material from three proposed annual cruises in 2008 and 2009. Significantly, material from marine salmon surveys carried out over the past two decades such as archived tissues for genetic stock identification to river/region of origin, salmon scales, and tag recovery information will form a major input to the project.

In 2008, Canada will make available a research vessel for 23 days, primarily in August, for the sampling of pelagic fishes including post smolts off the North American Coast. Objectives include documenting the distribution and abundance of salmon, and correlating these data with the abundance of other species including microplankton, and oceanographic conditions. Personnel from Canada and the USA will participate in the cruise, and sampling will be concentrated in the Labrador Sea. Survey transects are designed to document both nearshore and offshore distributions of post smolts, and any captured salmon will be extensively sampled for stomach contents, disease status, stable isotope content, etc. In addition, Canada and the USA will continue its life history monitoring on 16 index rivers. This work provides both short- and long-term information on the biological responses of salmon populations to changes in marine survival. Finally, North America is investing heavily in the development of electronic technologies for tracking the movements of salmon at sea. Descriptions of this work are provided in Sections 2.1.1 to 2.5.3 of this report.

SALSEA specifically identified an expanded sampling programme for the West Greenland fishery as one of its key goals. In total, 6 samplers would be required to be deployed across three sampling divisions over the course of the fishery. Prior arrangements will be made with fishers from these communities for the purchase and delivery of fresh whole Atlantic salmon throughout the sampling programme. These fish will be heavily sampled, including – but not limited to – various external characteristics, tags, tissue samples for genetic stock identification, age and growth, feeding, condition of fish through lipid content and RNA/DNA analysis, elemental analysis of otoliths, maturity status, trophic ecology through stable isotope signatures, heavy metal and pollutant loads, viral, bacterial, and parasite abundance. Paramount to the success of this programme is the genetic stock identification of all sampled fish to a scale finer than continent of origin to facilitate comparisons among and between various stock groupings. Annual operating costs (sampling supplies, purchase of fish, shipping costs, coordination...) for this programme will be supported by continued participation by the Parties and existing funds. External funding will need to be sought to support much of costs associated with sample processing. It is expected that some of the processing may be undertaken by the participating Parties as additional in-kind support. ICES supports the further development and implementation of an expanded West Greenland sampling programme in support of SALSEA as an extremely cost-effective means of sampling Atlantic salmon in the marine environment.

### **2.7.3 Update on marine research in the Barents Sea**

A collaborative research project (2007–2010) involving research institutions and universities from Norway, Finland, Russia, and Canada, co-funded by the Norwegian Research Council and other national institutions, aims at investigating various elements of the marine ecology of the northernmost European salmon populations in the Barents Sea area. The main goals of the project include assessment of long-term changes in the marine trophic ecology of salmon by analysis of stable

isotope signatures, determining marine distribution patterns and ocean feeding areas by the use of archival data storage tags (DST's) and satellite tags on kelts, developing a time-series of marine survival for one salmon stock, and examining long-term co-variation in abundance and survival of salmon stocks in different Barents Sea rivers.

A video monitoring site was established in a tributary of the River Teno (Finland) in 2002 for collection of data on the sea survival of salmon. This time-series will be continued in this project, at least until 2010. In 2007, 30 kelts were equipped with archival satellite "pop-up" tags and released in the River Teno, and more than 300 kelts tagged with DSTs were released in four different Barents Sea rivers in Norway, Finland, and Russia. Tagging with DSTs and conventional anchor tags will continue in 2008.

## **2.8 NASCO has asked ICES to provide a compilation of tag releases by country in 2007 and advise on progress with compiling historical tag recovery data from oceanic areas**

### **2.8.1 Compilation of tag releases and finclip data by ICES member countries in 2007**

Data on releases of tagged, fin-clipped, and otherwise marked salmon in 2007 were provided by ICES and are compiled as a separate report (ICES, 2007b). A summary of tag releases is provided in Table 2.8.1.1.

### **2.8.2 Workshop on Salmon Historical Information – New Investigations from Old Tagging Data (WKSHINI)**

At the 2007 ICES Annual Science Conference it was decided that a Workshop on Salmon Historical Information – New Investigations from Old Tagging Data [WKSHINI] (Chair: Lars Petter Hansen, Norway) will be established (2007/2/DFC02), and will meet in Halifax, Canada, from 18–20 September 2008 to:

- build on progress made in WKDUHSTI (2007);
- provide further information from historical oceanic tagging and recovery programmes in the format agreed at WKDUHSTI;
- update the database of tagging and tag recovery information which was established in WKDUHSTI;
- develop testable hypotheses of salmon migration and behaviour;
- test these hypotheses using information compiled in WKDUHSTI and any new information which becomes available;
- use the information to describe distribution of salmon of different river (stock) origins and sea age in time and space and assess changes in the distribution over time in relation to hydrographical factors.

WKSHINI will report by 1 November 2008 for the attention of the Diadromous Fish Committee and WGNAS.

Table 2.1.1.1 Reported total nominal catch of salmon by country (in tonnes round fresh weight), 1960–2007. (2007 figures include provisional data).

| Year | NAC Area      |     |         | NEAC (N. Area) |               |         |       |               |      |         | NEAC (S. Area)         |             |                         |                         |               |              | Faroes & Greenland |                       |                       |               | Total    | Unreported catches  |                              |
|------|---------------|-----|---------|----------------|---------------|---------|-------|---------------|------|---------|------------------------|-------------|-------------------------|-------------------------|---------------|--------------|--------------------|-----------------------|-----------------------|---------------|----------|---------------------|------------------------------|
|      | Canada<br>(1) | USA | St. P&M | Norway<br>(2)  | Russia<br>(3) | Iceland |       | (West)<br>(4) | Den. | Finland | UK<br>(E & W)<br>(5,6) |             | UK<br>(N.Irl.)<br>(6,7) | UK<br>(Scotl.)<br>(6,7) | France<br>(8) | Spain<br>(9) | Faroes<br>(10)     | East<br>Grld.<br>(11) | West<br>Grld.<br>(11) | Other<br>(12) | Reported | NASCO<br>Areas (13) | International<br>waters (14) |
|      |               |     |         |                |               | Wild    | Ranch |               |      |         | UK<br>(6,7)            | UK<br>(6,7) | Grld.<br>(11)           | Grld.<br>(11)           |               |              |                    | Nominal<br>Catch      |                       |               |          |                     |                              |
| 1960 | 1,636         | 1   | -       | 1,659          | 1,100         | 100     |       | 40            | -    | -       | 743                    | 283         | 139                     | 1,443                   | -             | 33           | -                  | -                     | 60                    | -             | 7,237    | -                   | -                            |
| 1961 | 1,583         | 1   | -       | 1,533          | 790           | 127     |       | 27            | -    | -       | 707                    | 232         | 132                     | 1,185                   | -             | 20           | -                  | -                     | 127                   | -             | 6,464    | -                   | -                            |
| 1962 | 1,719         | 1   | -       | 1,935          | 710           | 125     |       | 45            | -    | -       | 1,459                  | 318         | 356                     | 1,738                   | -             | 23           | -                  | -                     | 244                   | -             | 8,673    | -                   | -                            |
| 1963 | 1,861         | 1   | -       | 1,786          | 480           | 145     |       | 23            | -    | -       | 1,458                  | 325         | 306                     | 1,725                   | -             | 28           | -                  | -                     | 466                   | -             | 8,604    | -                   | -                            |
| 1964 | 2,069         | 1   | -       | 2,147          | 590           | 135     |       | 36            | -    | -       | 1,617                  | 307         | 377                     | 1,907                   | -             | 34           | -                  | -                     | 1,539                 | -             | 10,759   | -                   | -                            |
| 1965 | 2,116         | 1   | -       | 2,000          | 590           | 133     |       | 40            | -    | -       | 1,457                  | 320         | 281                     | 1,593                   | -             | 42           | -                  | -                     | 861                   | -             | 9,434    | -                   | -                            |
| 1966 | 2,369         | 1   | -       | 1,791          | 570           | 104     | 2     | 36            | -    | -       | 1,238                  | 387         | 287                     | 1,595                   | -             | 42           | -                  | -                     | 1,370                 | -             | 9,792    | -                   | -                            |
| 1967 | 2,863         | 1   | -       | 1,980          | 883           | 144     | 2     | 25            | -    | -       | 1,463                  | 420         | 449                     | 2,117                   | -             | 43           | -                  | -                     | 1,601                 | -             | 11,991   | -                   | -                            |
| 1968 | 2,111         | 1   | -       | 1,514          | 827           | 161     | 1     | 20            | -    | -       | 1,413                  | 282         | 312                     | 1,578                   | -             | 38           | 5                  | -                     | 1,127                 | 403           | 9,793    | -                   | -                            |
| 1969 | 2,202         | 1   | -       | 1,383          | 360           | 131     | 2     | 22            | -    | -       | 1,730                  | 377         | 267                     | 1,955                   | -             | 54           | 7                  | -                     | 2,210                 | 893           | 11,594   | -                   | -                            |
| 1970 | 2,323         | 1   | -       | 1,171          | 448           | 182     | 13    | 20            | -    | -       | 1,787                  | 527         | 297                     | 1,392                   | -             | 45           | 12                 | -                     | 2,146                 | 922           | 11,286   | -                   | -                            |
| 1971 | 1,992         | 1   | -       | 1,207          | 417           | 196     | 8     | 18            | -    | -       | 1,639                  | 426         | 234                     | 1,421                   | -             | 16           | -                  | -                     | 2,689                 | 471           | 10,735   | -                   | -                            |
| 1972 | 1,759         | 1   | -       | 1,578          | 462           | 245     | 5     | 18            | -    | 32      | 1,804                  | 442         | 210                     | 1,727                   | 34            | 40           | 9                  | -                     | 2,113                 | 486           | 10,965   | -                   | -                            |
| 1973 | 2,434         | 3   | -       | 1,726          | 772           | 148     | 8     | 23            | -    | 50      | 1,930                  | 450         | 182                     | 2,006                   | 12            | 24           | 28                 | -                     | 2,341                 | 533           | 12,670   | -                   | -                            |
| 1974 | 2,539         | 1   | -       | 1,633          | 709           | 215     | 10    | 32            | -    | 76      | 2,128                  | 383         | 184                     | 1,628                   | 13            | 16           | 20                 | -                     | 1,917                 | 373           | 11,877   | -                   | -                            |
| 1975 | 2,485         | 2   | -       | 1,537          | 811           | 145     | 21    | 26            | -    | 76      | 2,216                  | 447         | 164                     | 1,621                   | 25            | 27           | 28                 | -                     | 2,030                 | 475           | 12,136   | -                   | -                            |
| 1976 | 2,506         | 1   | 3       | 1,530          | 542           | 216     | 9     | 20            | -    | 66      | 1,561                  | 208         | 113                     | 1,019                   | 9             | 21           | 40                 | <1                    | 1,175                 | 289           | 9,327    | -                   | -                            |
| 1977 | 2,545         | 2   | -       | 1,488          | 497           | 123     | 7     | 10            | -    | 59      | 1,372                  | 345         | 110                     | 1,160                   | 19            | 19           | 40                 | 6                     | 1,420                 | 192           | 9,414    | -                   | -                            |
| 1978 | 1,545         | 4   | -       | 1,050          | 476           | 285     | 6     | 10            | -    | 37      | 1,230                  | 349         | 148                     | 1,323                   | 20            | 32           | 37                 | 8                     | 984                   | 138           | 7,682    | -                   | -                            |
| 1979 | 1,287         | 3   | -       | 1,831          | 455           | 219     | 6     | 12            | -    | 26      | 1,097                  | 261         | 99                      | 1,076                   | 10            | 29           | 119                | <0,5                  | 1,395                 | 193           | 8,118    | -                   | -                            |
| 1980 | 2,680         | 6   | -       | 1,830          | 664           | 241     | 8     | 17            | -    | 34      | 947                    | 360         | 122                     | 1,134                   | 30            | 47           | 536                | <0,5                  | 1,194                 | 277           | 10,127   | -                   | -                            |
| 1981 | 2,437         | 6   | -       | 1,656          | 463           | 147     | 16    | 26            | -    | 44      | 685                    | 493         | 101                     | 1,233                   | 20            | 25           | 1,025              | <0,5                  | 1,264                 | 313           | 9,954    | -                   | -                            |
| 1982 | 1,798         | 6   | -       | 1,348          | 364           | 130     | 17    | 25            | -    | 54      | 993                    | 286         | 132                     | 1,092                   | 20            | 10           | 606                | <0,5                  | 1,077                 | 437           | 8,395    | -                   | -                            |
| 1983 | 1,424         | 1   | 3       | 1,550          | 507           | 166     | 32    | 28            | -    | 58      | 1,656                  | 429         | 187                     | 1,221                   | 16            | 23           | 678                | <0,5                  | 310                   | 466           | 8,755    | -                   | -                            |
| 1984 | 1,112         | 2   | 3       | 1,623          | 593           | 139     | 20    | 40            | -    | 46      | 829                    | 345         | 78                      | 1,013                   | 25            | 18           | 628                | <0,5                  | 297                   | 101           | 6,912    | -                   | -                            |
| 1985 | 1,133         | 2   | 3       | 1,561          | 659           | 162     | 55    | 45            | -    | 49      | 1,595                  | 361         | 98                      | 913                     | 22            | 13           | 566                | 7                     | 864                   | -             | 8,108    | -                   | -                            |
| 1986 | 1,559         | 2   | 3       | 1,598          | 608           | 232     | 59    | 54            | -    | 37      | 1,730                  | 430         | 109                     | 1,271                   | 28            | 27           | 530                | 19                    | 960                   | -             | 9,255    | 315                 | -                            |
| 1987 | 1,784         | 1   | 2       | 1,385          | 564           | 181     | 40    | 47            | -    | 49      | 1,239                  | 302         | 56                      | 922                     | 27            | 18           | 576                | <0,5                  | 966                   | -             | 8,159    | 2,788               | -                            |
| 1988 | 1,310         | 1   | 2       | 1,076          | 420           | 217     | 180   | 40            | -    | 36      | 1,874                  | 395         | 114                     | 882                     | 32            | 18           | 243                | 4                     | 893                   | -             | 7,737    | 3,248               | -                            |
| 1989 | 1,139         | 2   | 2       | 905            | 364           | 141     | 136   | 29            | -    | 52      | 1,079                  | 296         | 142                     | 895                     | 14            | 7            | 364                | -                     | 337                   | -             | 5,904    | 2,277               | -                            |
| 1990 | 911           | 2   | 2       | 930            | 313           | 141     | 285   | 33            | 13   | 60      | 567                    | 338         | 94                      | 624                     | 15            | 7            | 315                | -                     | 274                   | -             | 4,925    | 1,890               | 180-350                      |

Table 2.1.1.1 continued

| Year      | NAC Area      |     |         | NEAC (N. Area) |               |         |       |                         |      |         | NEAC (S. Area)   |                        |                         |                       |               | Faroes & Greenland |                |               |               | Total         | Unreported catches           |                     |                              |
|-----------|---------------|-----|---------|----------------|---------------|---------|-------|-------------------------|------|---------|------------------|------------------------|-------------------------|-----------------------|---------------|--------------------|----------------|---------------|---------------|---------------|------------------------------|---------------------|------------------------------|
|           | Canada<br>(1) | USA | St. P&M | Norway<br>(2)  | Russia<br>(3) | Iceland |       | Sweden<br>(West)<br>(4) | Den. | Finland | Ireland<br>(5,6) | UK<br>(E & W)<br>(6,7) | UK<br>(N.Irl.)<br>(6,7) | UK<br>(Scotl.)<br>(8) | France<br>(8) | Spain<br>(9)       | Faroes<br>(10) | Grld.<br>(11) | Grld.<br>(11) | Other<br>(12) | Reported<br>Nominal<br>Catch | NASCO<br>Areas (13) | International<br>waters (14) |
|           |               |     |         |                |               | Wild    | Ranch |                         |      |         |                  |                        |                         |                       |               |                    |                |               |               |               |                              |                     |                              |
| 1991      | 711           | 1   | 1       | 876            | 215           | 129     | 346   | 38                      | 3    | 70      | 404              | 200                    | 55                      | 462                   | 13            | 11                 | 95             | 4             | 472           | -             | 4,106                        | 1,682               | 25-100                       |
| 1992      | 522           | 1   | 2       | 867            | 167           | 174     | 462   | 49                      | 10   | 77      | 630              | 171                    | 91                      | 600                   | 20            | 11                 | 23             | 5             | 237           | -             | 4,119                        | 1,962               | 25-100                       |
| 1993      | 373           | 1   | 3       | 923            | 139           | 157     | 499   | 56                      | 9    | 70      | 541              | 248                    | 83                      | 547                   | 16            | 8                  | 23             | -             | -             | -             | 3,696                        | 1,644               | 25-100                       |
| 1994      | 355           | 0   | 3       | 996            | 141           | 136     | 313   | 44                      | 6    | 49      | 804              | 324                    | 91                      | 649                   | 18            | 10                 | 6              | -             | -             | -             | 3,945                        | 1,276               | 25-100                       |
| 1995      | 260           | 0   | 1       | 839            | 128           | 146     | 303   | 37                      | 3    | 48      | 790              | 295                    | 83                      | 588                   | 10            | 9                  | 5              | 2             | 83            | -             | 3,629                        | 1,060               | -                            |
| 1996      | 292           | 0   | 2       | 787            | 131           | 118     | 243   | 33                      | 2    | 44      | 685              | 183                    | 77                      | 427                   | 13            | 7                  | -              | 0             | 92            | -             | 3,136                        | 1,123               | -                            |
| 1997      | 229           | 0   | 2       | 630            | 111           | 97      | 59    | 19                      | 1    | 45      | 570              | 142                    | 93                      | 296                   | 8             | 3                  | -              | 1             | 58            | -             | 2,364                        | 827                 | -                            |
| 1998      | 157           | 0   | 2       | 740            | 131           | 119     | 46    | 15                      | 1    | 48      | 624              | 123                    | 78                      | 283                   | 8             | 4                  | 6              | 0             | 11            | -             | 2,396                        | 1,210               | -                            |
| 1999      | 152           | 0   | 2       | 811            | 103           | 111     | 35    | 16                      | 1    | 62      | 515              | 150                    | 53                      | 199                   | 11            | 6                  | 0              | 0             | 19            | -             | 2,247                        | 1,032               | -                            |
| 2000      | 153           | 0   | 2       | 1,176          | 124           | 73      | 11    | 33                      | 5    | 95      | 621              | 219                    | 78                      | 274                   | 11            | 7                  | 8              | 0             | 21            | -             | 2,912                        | 1,269               | -                            |
| 2001      | 148           | 0   | 2       | 1,267          | 114           | 74      | 14    | 33                      | 6    | 126     | 730              | 184                    | 53                      | 251                   | 11            | 13                 | 0              | 0             | 43            | -             | 3,069                        | 1,180               | -                            |
| 2002      | 148           | 0   | 2       | 1,019          | 118           | 90      | 7     | 28                      | 5    | 93      | 682              | 161                    | 81                      | 191                   | 11            | 9                  | 0              | 0             | 9             | -             | 2,654                        | 1,039               | -                            |
| 2003      | 141           | 0   | 3       | 1,071          | 107           | 106     | 11    | 25                      | 4    | 78      | 551              | 89                     | 56                      | 192                   | 13            | 7                  | 0              | 0             | 9             | -             | 2,462                        | 847                 | -                            |
| 2004      | 161           | 0   | 3       | 784            | 82            | 118     | 11    | 19                      | 4    | 39      | 489              | 111                    | 48                      | 245                   | 19            | 7                  | 0              | 0             | 15            | -             | 2,155                        | 686                 | -                            |
| 2005      | 139           | 0   | 3       | 888            | 82            | 132     | 17    | 15                      | 8    | 47      | 422              | 97                     | 52                      | 215                   | 11            | 13                 | 0              | 0             | 15            | -             | 2,156                        | 700                 | -                            |
| 2006      | 137           | 0   | 3       | 932            | 91            | 104     | 17    | 14                      | 2    | 67      | 326              | 80                     | 29                      | 192                   | 13            | 11                 | 0              | 0             | 22            | -             | 2,040                        | 670                 | -                            |
| 2007      | 112           | 0   | 2       | 767            | 63            | 87      | 35    | 16                      | 3    | 58      | 85               | 76                     | 24                      | 159                   | 11            | 10                 | 0              | 0             | 25            | -             | 1,533                        | 475                 | -                            |
| Average   |               |     |         |                |               |         |       |                         |      |         |                  |                        |                         |                       |               |                    |                |               |               |               |                              |                     |                              |
| 2002-2006 | 145           | 0   | 3       | 939            | 96            | 110     | 13    | 20                      | 4    | 65      | 494              | 108                    | 53                      | 207                   | 13            | 9                  | 0              | 0             | 14            | -             | 2,294                        | 788                 | -                            |
| 1997-2006 | 157           | 0   | 2       | 932            | 106           | 102     | 23    | 22                      | 4    | 70      | 553              | 136                    | 62                      | 234                   | 12            | 8                  | 2              | 0             | 22            | -             | 2,445                        | 946                 | -                            |

Key:

- Includes estimates of some local sales, and, prior to 1984, by-catch.
- Before 1966, sea trout and sea charr included (5% of total).
- Figures from 1991 to 2000 do not include catches taken in the recently developed recreational (rod) fishery.
- From 1990, catch includes fish landed for both commercial and angling purposes.
- Improved reporting of rod catches in 1994 and data derived from carcase tagging and log books from 2002.
- Catch on River Foyle allocated 50% Ireland and 50% N. Ireland.
- Angling catch (derived from carcase tagging and log books) first included in 2002.

- Data for France include some unreported catches.
- Weights estimated from mean weight of fish caught in Asturias (80-90% of Spanish catch).
- Between 1991 & 1999, there was only a research fishery at Faroes. In 1997 & 1999 no fishery took place; the commercial fishery resumed in 2000, but has not operated since 2001.
- Includes catches made in the West Greenland area by Norway, Faroes, Sweden and Denmark in 1965-1975.
- Includes catches in Norwegian Sea by vessels from Denmark, Sweden, Germany, Norway and Finland.
- No unreported catch estimate for Canada in 2007.
- Estimates refer to season ending in given year.



**Table 2.5.1.1 Summary of acoustic smolt tracking studies, by region.**

| Region       | No. rivers | No. of studies with |                 | Impounded rivers | No. of replicates | Estuary length (km) | Time period |
|--------------|------------|---------------------|-----------------|------------------|-------------------|---------------------|-------------|
|              |            | wild smolts         | hatchery smolts |                  |                   |                     |             |
| S. NEAC      | 5          | 4                   | 1               | 1                | 1 - 4             | 1.2 - 2.9           | 1992 - 2007 |
| USA          | 4          | 3                   | 3               | 0                | 2 - 7             | 2.0 - 47.5          | 1997 - 2006 |
| Scotia Fundy | 1          | 1                   | 0               | 0                | 2                 | 127                 | 2002 - 2003 |
| Gulf         | 4          | 0                   | 4               | 0                | 3 - 5             | 2.5 - 122           | 2003 - 2007 |
| Newfoundland | 1          | 1                   | 0               | 0                | 1                 | 3                   | 2007        |

Table 2.8.1.1 Summary of Atlantic salmon tagged and marked in 2007. 'Hatchery' and 'Wild' refer to smolts and parr; 'Adults' relates to both wild and hatchery-origin fish.

| Country              | Origin   | Primary Tag or Mark |               |              |                      | Total     |
|----------------------|----------|---------------------|---------------|--------------|----------------------|-----------|
|                      |          | Microtag            | External mark | Adipose clip | Pit tag <sup>2</sup> |           |
| Belgium              | Hatchery | 11,800              | 0             | 0            | 0                    | 11,800    |
|                      | Wild     | 0                   | 0             | 0            | 0                    | 0         |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 11,800              | 0             | 0            | 0                    | 11,800    |
| Canada               | Hatchery | 0                   | 4,360         | 768,978      | 157                  | 773,495   |
|                      | Wild     | 0                   | 23,746        | 29,223       | 574                  | 53,543    |
|                      | Adult    | 0                   | 4,308         | 1,226        | 311                  | 5,845     |
|                      | Total    | 0                   | 32,414        | 799,427      | 1,042                | 832,883   |
| France <sup>1</sup>  | Hatchery | 0                   | 0             | 459,267      | 0                    | 459,267   |
|                      | Wild     | 0                   | 0             | 746          | 1,881                | 2,627     |
|                      | Adult    | 0                   | 0             | 175          | 65                   | 240       |
|                      | Total    | 0                   | 0             | 460,188      | 1,946                | 462,134   |
| Germany              | Hatchery | 33,146              | 0             | 7765         | 0                    | 40,911    |
|                      | Wild     | 0                   | 300           | 0            | 0                    | 300       |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 33,146              | 300           | 7,765        | 0                    | 41,211    |
| Iceland              | Hatchery | 121,140             | 0             | 0            | 0                    | 121,140   |
|                      | Wild     | 2,360               | 0             | 0            | 0                    | 2,360     |
|                      | Adult    | 0                   | 2,774         | 0            | 0                    | 2,774     |
|                      | Total    | 123,500             | 2,774         | 0            | 0                    | 126,274   |
| Ireland              | Hatchery | 227,531             | 0             | 0            | 0                    | 227,531   |
|                      | Wild     | 4,157               | 0             | 0            | 0                    | 4,157     |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 231,688             | 0             | 0            | 0                    | 231,688   |
| Norway               | Hatchery | 19,425              | 43,928        | 0            | 0                    | 63,353    |
|                      | Wild     | 236                 | 2,709         | 0            | 0                    | 2,945     |
|                      | Adult    | 0                   | 1290          | 0            | 0                    | 1,290     |
|                      | Total    | 19,661              | 47,927        | 0            | 0                    | 67,588    |
| Russia               | Hatchery | 0                   | 0             | 1,231,544    | 0                    | 1,231,544 |
|                      | Wild     | 0                   | 2,975         | 263          | 135                  | 3,373     |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 0                   | 2,975         | 1,231,807    | 135                  | 1,234,917 |
| Spain                | Hatchery | 241,845             | 0             | 144,940      | 0                    | 386,785   |
|                      | Wild     | 0                   | 0             | 0            | 0                    | 0         |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 241,845             | 0             | 144,940      | 0                    | 386,785   |
| Sweden               | Hatchery | 0                   | 3,000         | 192,261      | 0                    | 195,261   |
|                      | Wild     | 0                   | 450           | 0            | 0                    | 450       |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 0                   | 3,450         | 192,261      | 0                    | 195,711   |
| UK (England & Wales) | Hatchery | 27,371              | 0             | 151,732      | 0                    | 179,103   |
|                      | Wild     | 14,110              | 0             | 14,098       | 0                    | 28,208    |
|                      | Adult    | 0                   | 1,937         | 0            | 0                    | 1,937     |
|                      | Total    | 41,481              | 1,937         | 165,830      | 0                    | 209,248   |
| UK (N. Ireland)      | Hatchery | 17,382              | 0             | 31,949       | 0                    | 49,331    |
|                      | Wild     | 1819                | 0             | 0            | 0                    | 1,819     |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 19,201              | 0             | 31,949       | 0                    | 51,150    |
| UK (Scotland)        | Hatchery | 62,976              | 0             | 0            | 0                    | 62,976    |
|                      | Wild     | 9,005               | 3,874         | 0            | 9,252                | 22,131    |
|                      | Adult    | 0                   | 0             | 0            | 0                    | 0         |
|                      | Total    | 71,981              | 3,874         | 0            | 9,252                | 85,107    |
| USA                  | Hatchery | 0                   | 105,577       | 277,162      | 37,377               | 420,116   |
|                      | Wild     | 0                   | 855           | 0            | 0                    | 855       |
|                      | Adult    | 0                   | 2,145         | 929          | 811                  | 3,885     |
|                      | Total    | 0                   | 108,577       | 278,091      | 38,188               | 424,856   |
| All Countries        | Hatchery | 717,670             | 156,865       | 3,257,833    | 37,534               | 4,222,613 |
|                      | Wild     | 31,687              | 34,609        | 44,330       | 11,842               | 122,768   |
|                      | Adult    | 0                   | 12,454        | 2,330        | 1,187                | 15,971    |
|                      | Total    | 749,357             | 203,928       | 3,304,493    | 50,563               | 4,361,352 |

<sup>1</sup> does not include 87,155 juveniles marked with fluorescent pigments nor 865 adults marked by dermojet.

<sup>2</sup> includes pit tags or other internal tags

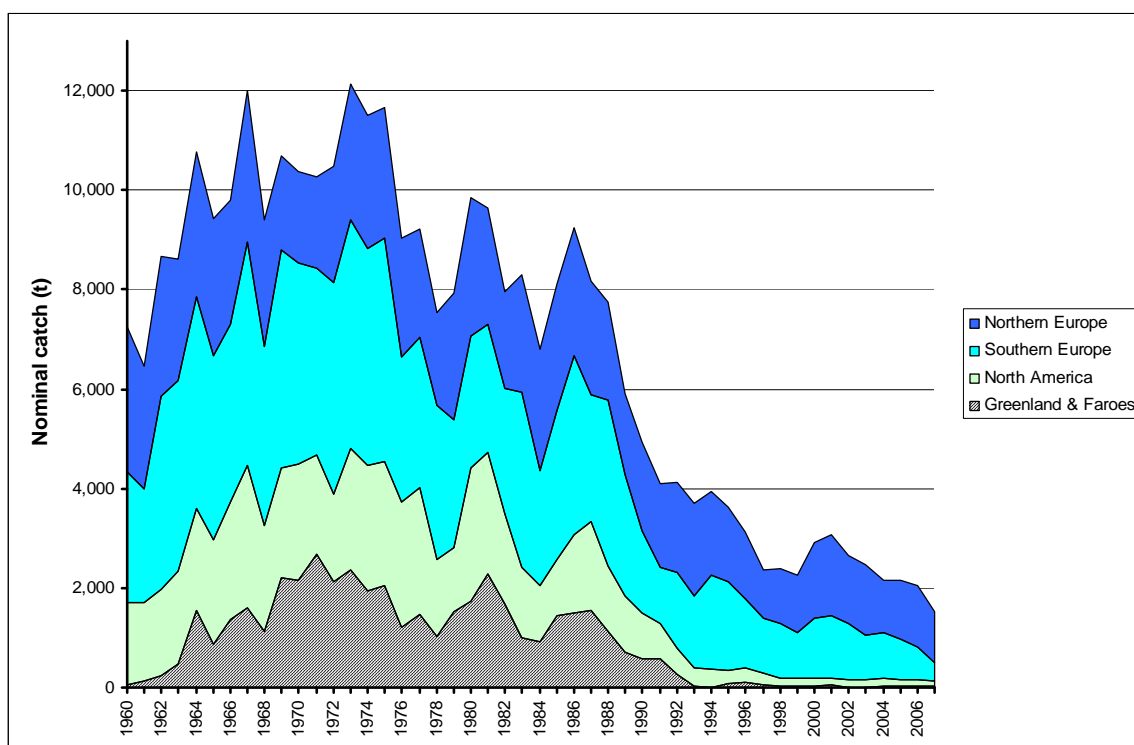


Figure 2.1.1.1 Reported total nominal catch of salmon (tonnes round fresh weight) in four North Atlantic regions, 1960–2007.

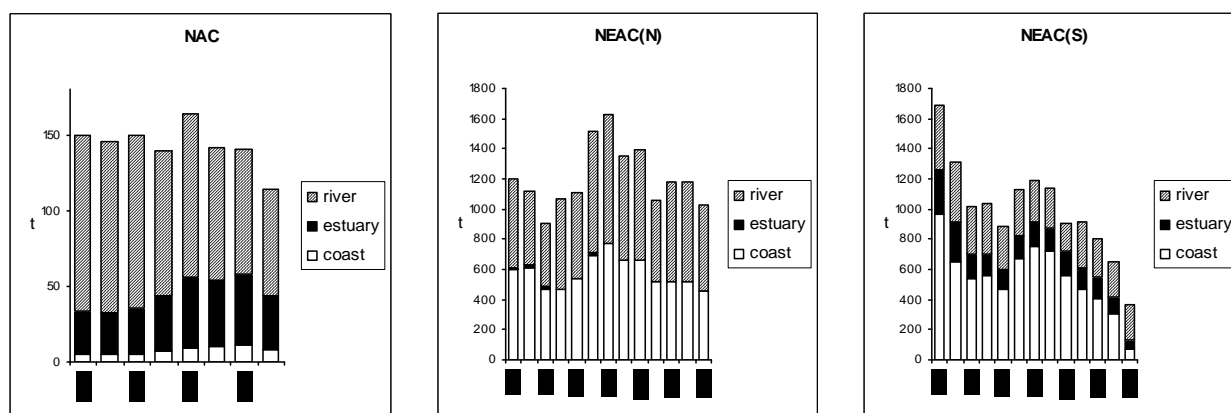


Figure 2.1.1.2 Nominal catch taken in coastal, estuarine, and riverine fisheries for the NAC area, and for the NEAC northern and southern areas. Note that time-series and y-axes vary.

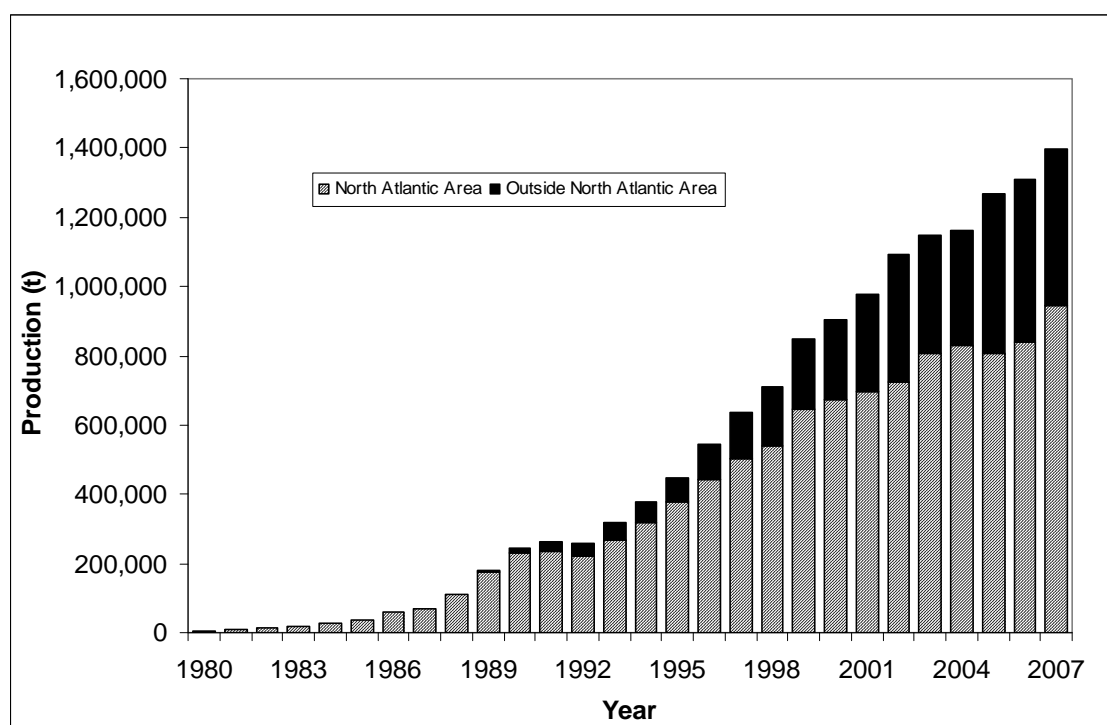


Figure 2.2.1 World-wide production of farmed Atlantic salmon, 1980–2007.

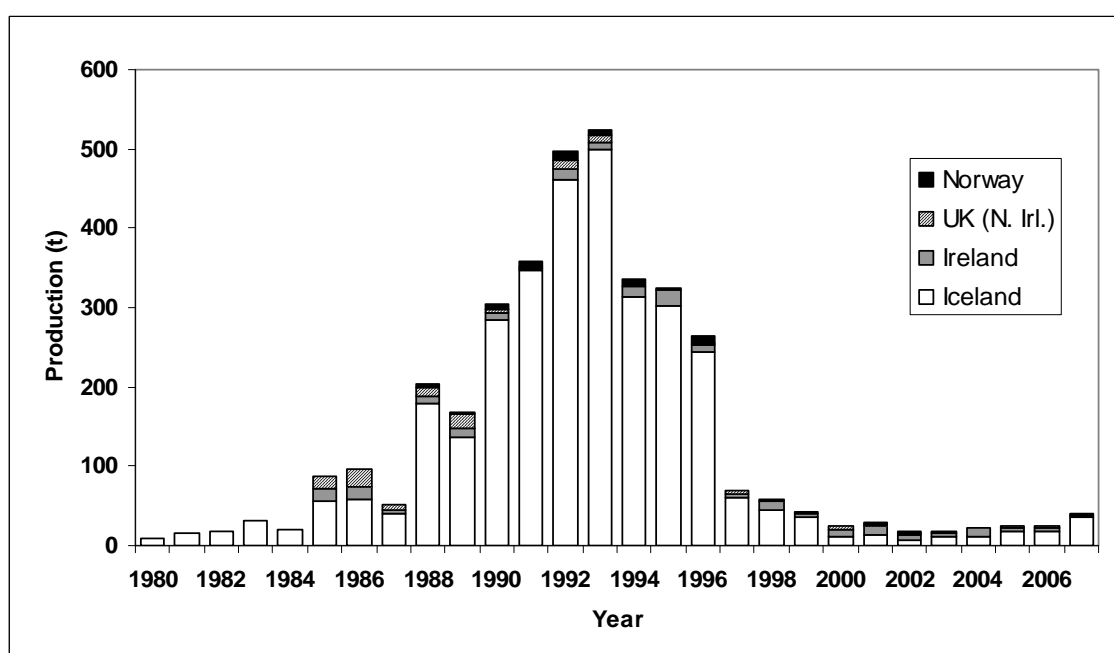


Figure 2.2.2 Production of farmed Atlantic salmon (tonnes round fresh weight) in the North Atlantic, 1980–2007.

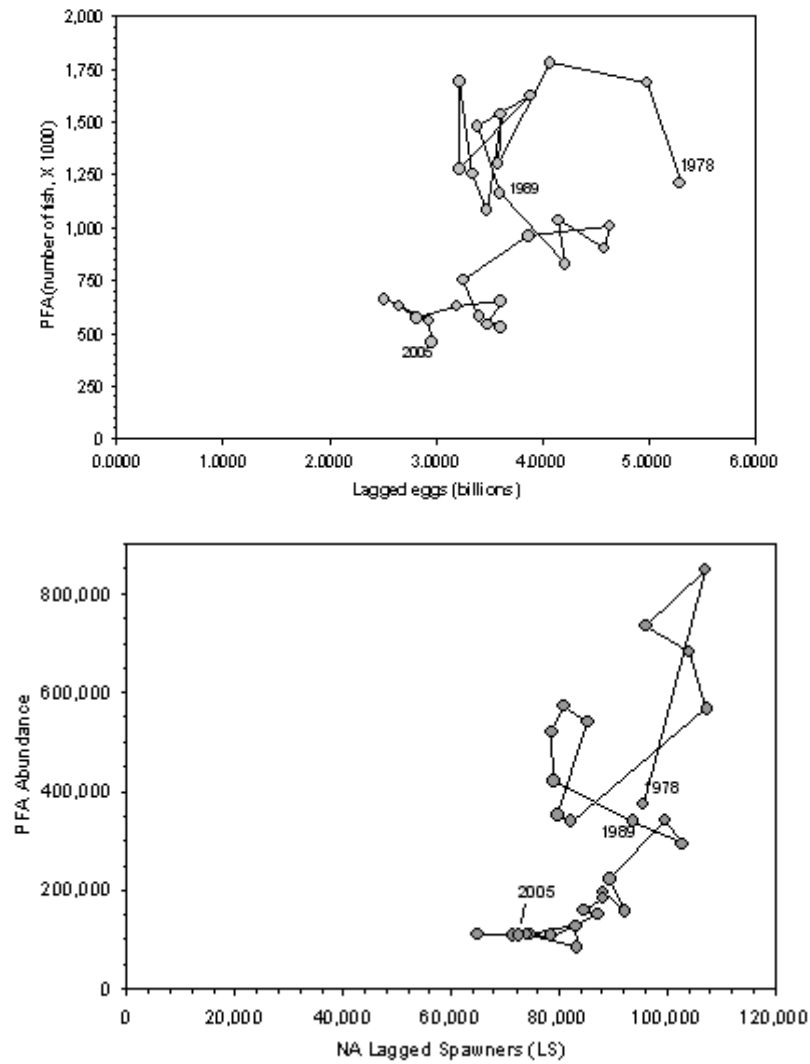


Figure 2.3.3.1 Relationship (based on midpoints) between PFA and lagged spawners for NAC (upper panel) and for southern NEAC non-maturing 1SW (lower panel), 1978 to 2006.

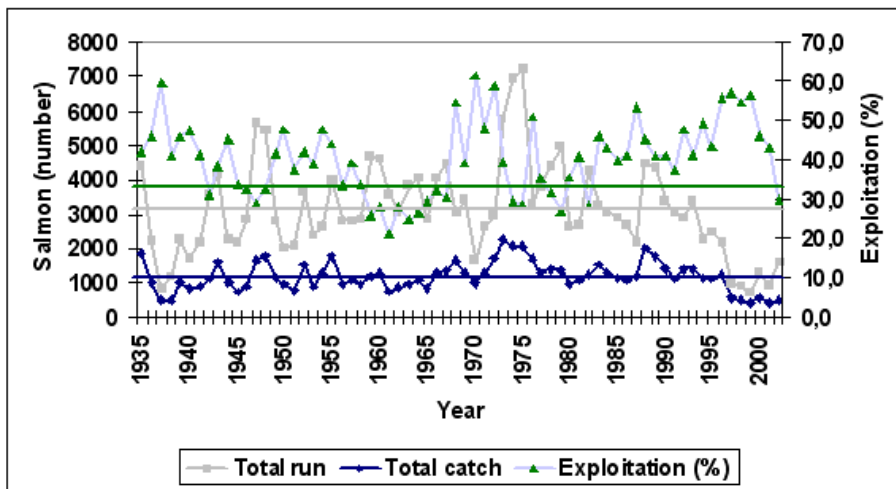


Figure 2.3.5.1 Total salmon run, catch, and exploitation in the salmon rod fishery in River Ellidaar 1935–2002.

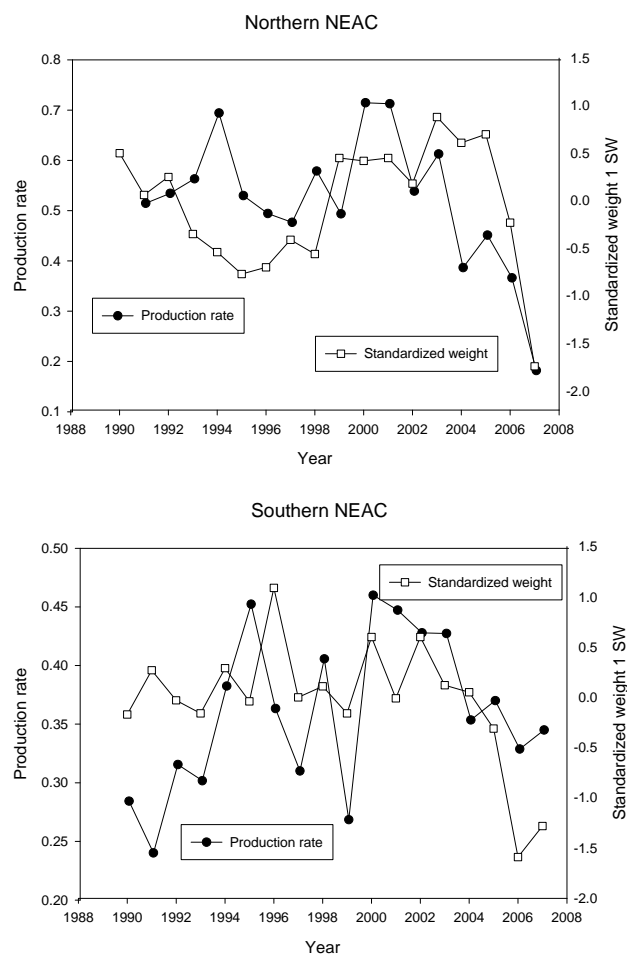


Figure 2.4.1.2 Production rate (calculated as PFA abundance divided by lagged eggs) and mean standardized (Z-score) weight of 1SW salmon (from 6 rivers in Northern and 7 rivers in Southern NEAC) plotted by year for Northern and Southern NEAC.

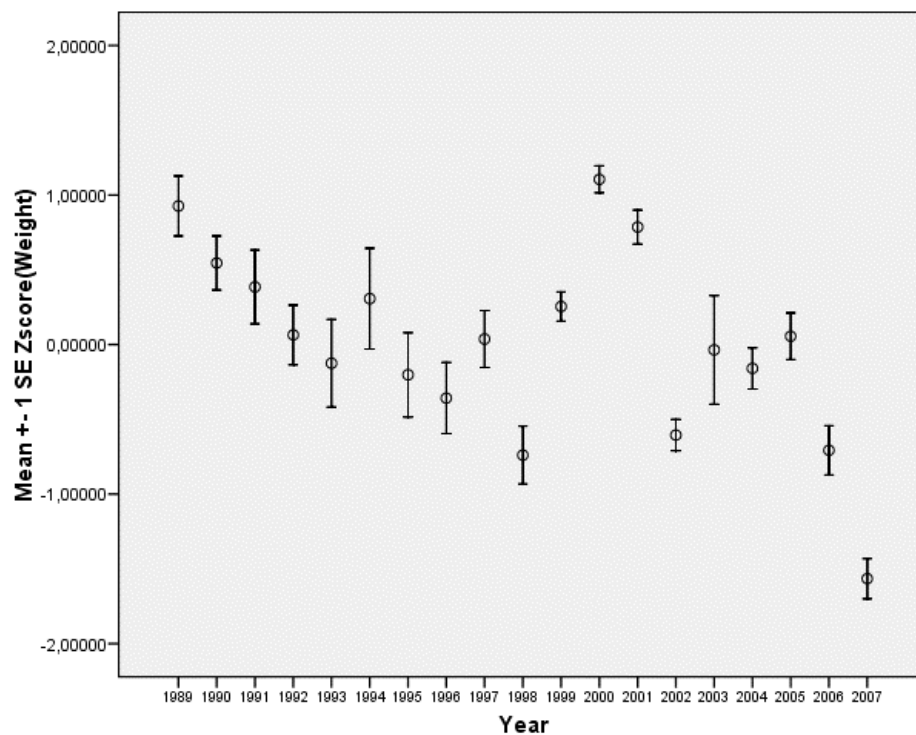


Figure 2.4.2.1 Mean standardized weight of 1 SW salmon in 20 Norwegian rivers in the period 1989–2007. The total number of 1 SW salmon analysed was 21 054.

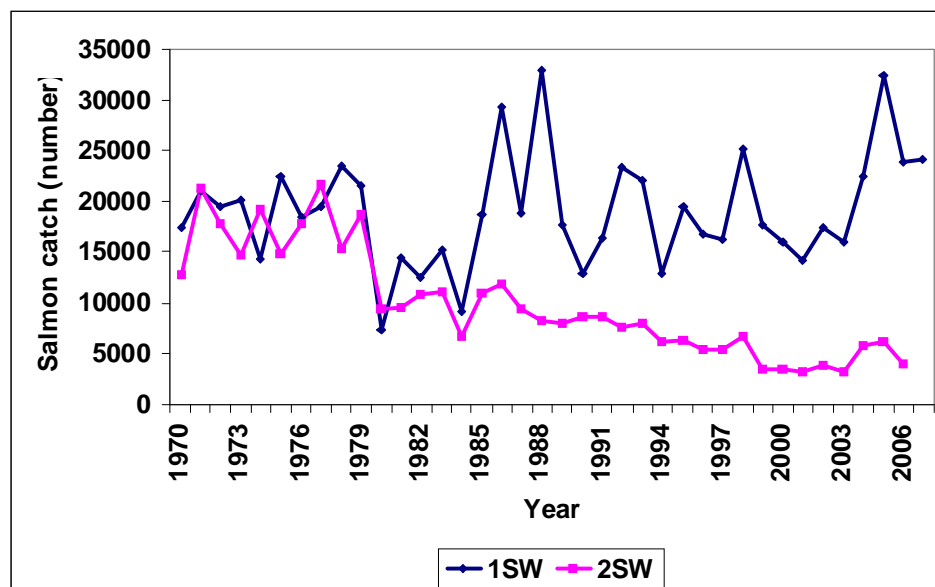


Figure 2.4.3.1 Sea-age composition of Icelandic salmon stocks in rod fisheries from 1970–2007.

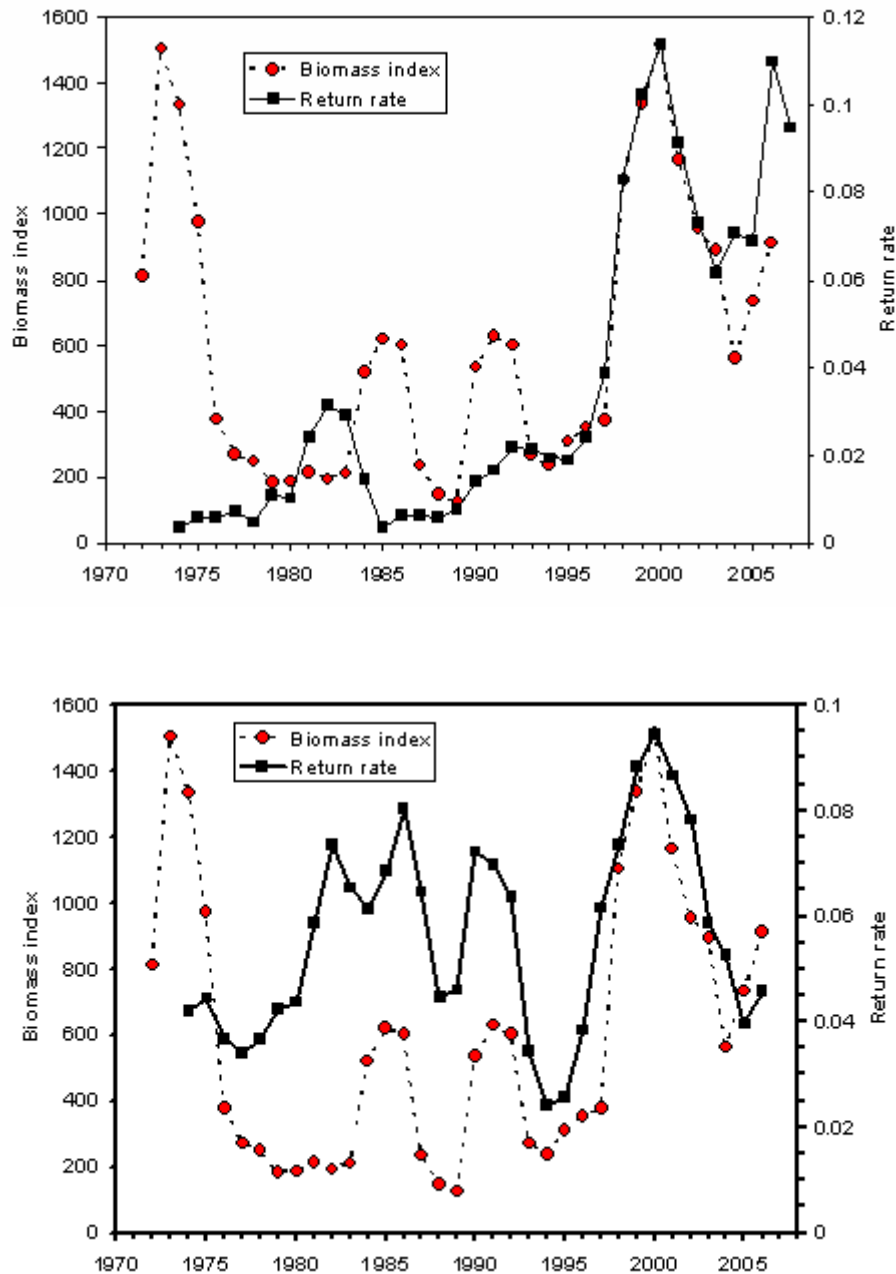


Figure 2.4.4.1 Trends in the biomass index of small fish from the southern Gulf of St. Lawrence and return rates to a second spawning of 1SW and 2SW salmon combined as consecutive spawners (upper panel) and alternate spawners (lower panel). The year corresponds to the year of the September groundfish survey for biomass and the year of reconditioning in the first return year at sea post-spawning for consecutive, in the second year at sea post spawning for alternates. All series are smoothed using 3-year running averages.



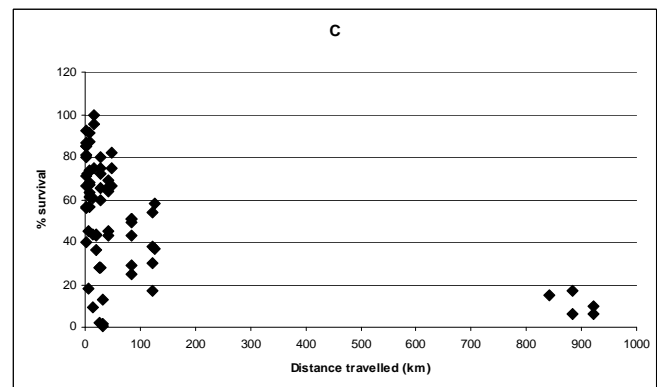
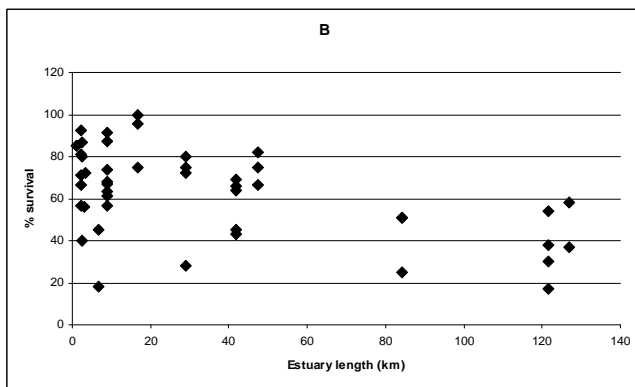
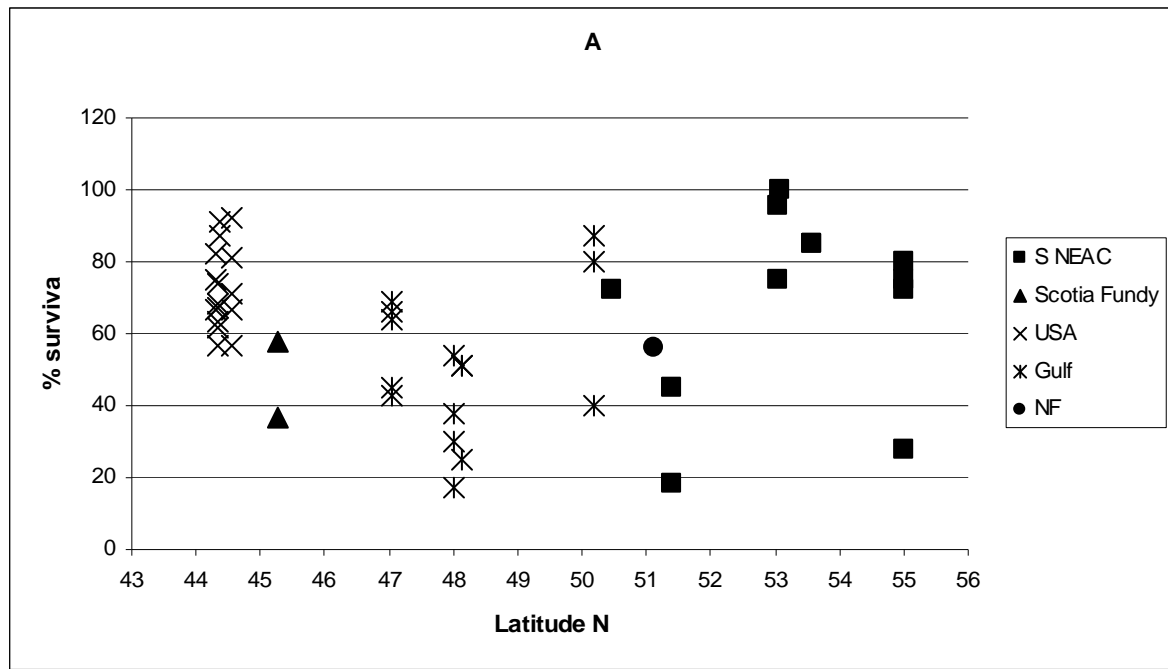


Figure 2.5.1.1 Plots of the percentage of sonically tagged smolts surviving to exit home river estuaries. Plots include data from studies in the NAC and NEAC areas and wild and hatchery origin smolts. Estimates from the same river in different years have been treated as independent observations. A: % survival vs. latitude. B: % survival vs. estuary length C: % of smolts from North American rivers known to be alive at various points in the coastal and ocean migration.

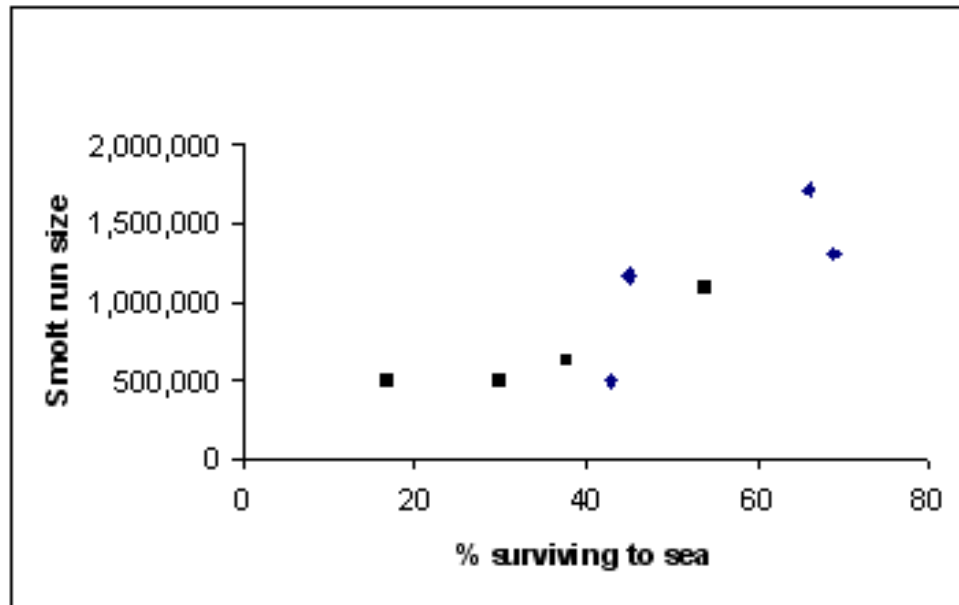


Figure 2.5.3.1 Relation between the percentage of the sample of sonically tagged salmon surviving estuary transit to enter the sea, and the midpoint estimate of the size of the smolt run from which the sample was drawn. Data come from the years 2003–2007 and are for the Miramichi (diamonds) and Restigouche (squares) Rivers.

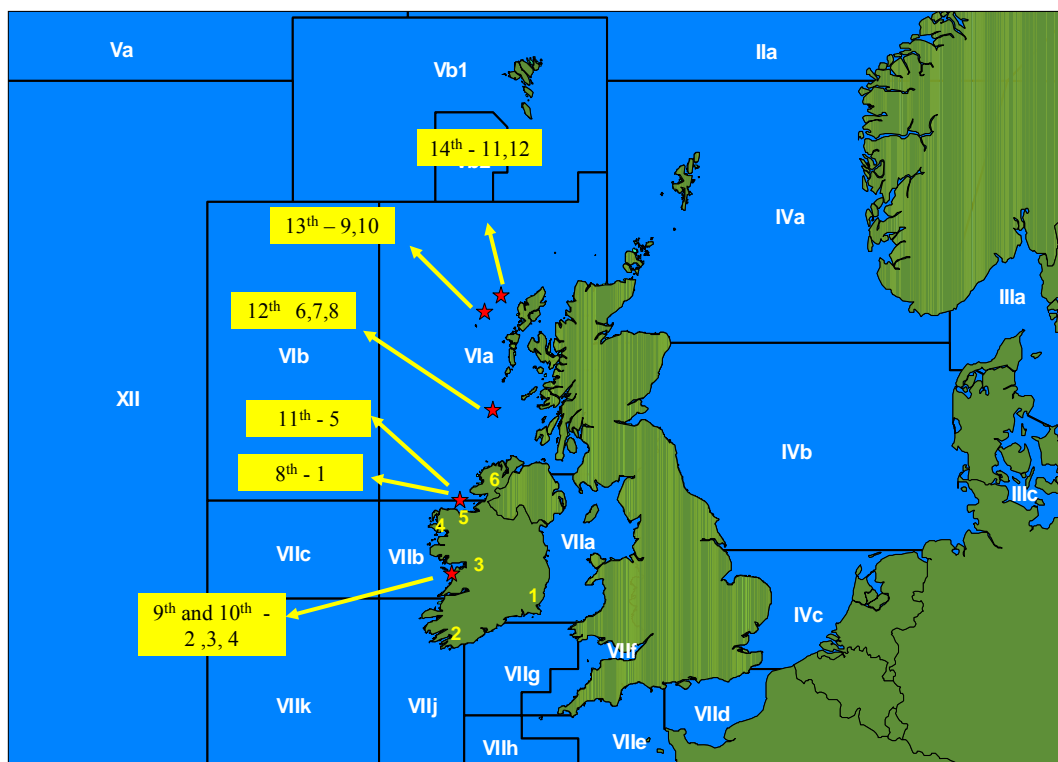


Figure 2.7.1.1 Location of post-smolt trawling locations and trawl numbers in May 2007. The rivers of origin of the Irish fish sampled based on the genetic stock identification are as follows: 1 = South Eastern Population Complex (SEPC), 2 = Roughty River (Kerry), 3 = River Corrib (Galway), 4 = Owenmore River (Mayo), 5 = Moy River (Mayo), Foyle River (Donegal/Derry).

6. NASCO has requested ICES to identify relevant data deficiencies, monitoring needs, and research requirements, taking into account NASCO's international Atlantic salmon research board's inventory of on-going research relating to salmon mortality in the sea
- 

ICES recommends that the Working Group on North Atlantic salmon should meet in 2009 to address questions posed by ICES and NASCO. ICES intends for the Working Group to convene in the headquarters of the **ICES in Copenhagen, Denmark from 30th March to 8th April 2009**.

#### 6.1 Prioritized list of recommendations

- 1) ICES recommends that efforts are continued to identify and collate further information on biological characteristics from river populations and fisheries throughout the North Atlantic. It is proposed that a study group be commissioned to facilitate a unified effort to further develop and investigate these datasets for changes in biological characteristics and stock performance.
- 2) ICES recommends a study group be commissioned to facilitate the development of PFA modeling approaches for both NAC and NEAC prior to the 2009 WGNAS.
- 3) ICES recognises that river-specific management requires extensive monitoring and recommends expanded monitoring programmes across both stock complexes.
- 4) ICES recommends the completion of a metadata directory of datasets from the West Greenland fishery, which should be referenced in the quality handbook. This data would be informative to the study group on biological characteristics recommended above.
- 5) ICES recommends that the data which forms the allocation of the Faroese catch amongst home water countries be re-examined, some progress towards this action will be generated from the WKSHINI (Section 2.8.2).



**Council**

**CNL(08)08**

***Report of the Seventh Meeting of the  
International Atlantic Salmon Research Board***

## **CNL(08)8**

### ***Report of the Seventh Meeting of the International Atlantic Salmon Research Board***

***2 June, 2008, Tryp Rey Pelayo Hotel Melia, Gijón, Spain***

#### **1. Opening of the Meeting**

- 1.1 The Chairman, Dr Ken Whelan, opened the meeting and welcomed members of the Board, their scientific advisers and representatives of the accredited NGOs to Gijón. He referred to the excellent progress that had been made during the year in implementing the SALSEA Programme and he looked forward to hearing updates on the various projects that had been initiated since the Board's last meeting.
- 1.2 A list of participants is contained in Annex 1.

#### **2. Adoption of the agenda**

- 2.1 The Board adopted its agenda, ICR(08)6 (Annex 2).

#### **3. Inventory of Research**

- 3.1 The Assistant Secretary provided an overview of the updated inventory of research relating to salmon mortality in the sea, ICR(08)2. The inventory is considered by the Board to be an essential tool in identifying research gaps and priorities, in improving coordination of existing research and in supporting promotion of SALSEA. He indicated that the inventory is made available to the ICES Working Group on North Atlantic Salmon (WGNAS) to assist it in identifying data deficiencies, monitoring needs and research requirements but that to date the information in the inventory had perhaps been under-utilised. This aspect had been considered by the SAG.
- 3.2 He noted that the SALSEA Programme adopted by the Board in 2005 comprised three main workpackages concerned with developing technologies, early migration and distribution and migration at sea (the marine survey component). In recent years there have been considerable developments with projects being initiated to trial pelagic trawl gear and to develop the genetic baselines needed to support identification of the origin of salmon caught at sea. There had also been an increasing number of studies utilizing acoustic tagging with detection arrays extending further out into oceanic areas. The 2008 inventory includes three significant new projects: SALSEA-Merge, SALSEA-North America and SALSEA-West Greenland. Details of these projects are given in the report of the SAG. In total, expenditure on the ongoing projects in the inventory in 2008 is approximately £6.7 million, a 32% increase compared to 2007 due largely to the inclusion of these three projects. There has therefore been very significant progress in implementing the SALSEA-Programme.

- 3.3. The Board agreed that Parties should be given an opportunity to provide to the Secretariat by 30 June any additional information for inclusion in the inventory. After that date the inventory should be made available on the Board's website.

#### **4. Report of the Scientific Advisory Group**

- 4.1 The report of the Board's Scientific Advisory Group (SAG) was presented by its Chairman, Dr Lars Petter Hansen (Norway), SAG(07)4 (Annex 3). The Group had reviewed the updated inventory of research; progress with promoting and implementing the SALSEA Programme; and three proposals for research funding. The SAG had also developed an approach for soliciting and prioritising research proposals.
- 4.2 The SAG had recognized that the valuable information in the inventory of research could be better utilized and had recommended to the Board that it should establish a Sub-Group of the SAG comprising at least one representative from each Party. It was proposed that the Sub-Group would work by correspondence and be Chaired by Ted Potter (EU). The Terms of Reference for the Sub-Group will be to review the inventory to identify areas where there might be merit in encouraging improved coordination of research and to highlight gaps in the research programme where new work might significantly benefit the SALSEA Programme and which might be considered for funding or support by the Board. The Board agreed to this proposal.
- 4.3 On the recommendation of the SAG, the Board also took the following decisions:
- to encourage countries to make available to the workshop on Salmon Historical Information – New Investigations from Old Tagging Data any relevant tagging data using the agreed template;
  - to appoint Dr Malcolm Windsor (Co-Convenor), Dr Peter Hutchinson (NASCO Secretariat), Dr Lars Petter Hansen (SAG Chairman), Dr Jens Christian Holst (SALSEA-Merge), Mr David Reddin (SALSEA- North America) and an NGO representative (to be nominated) to the Steering Committee for the joint symposium on Salmon at Sea ('The Salmon Summit'). The Board felt that the timing of this symposium was crucial and would need careful consideration by the Steering Committee but Spring 2011 might be appropriate if a timing could be agreed that did not conflict with preparations for and the meeting of the WGNAS and preparation of the final report of the SALSEA-MERGE project to the European Commission;
  - to fund the first year of a three year study to continue work supported by the Board in 2007/2008 to examine any changes in trophic levels of Atlantic salmon through the marine phase of their life cycle. A sum of CAN\$39,000 (approximately £20,000) would be contributed;
  - to fund participation of two scientists in the proposed ICES Study Group to continue to identify and collate further information on biological characteristics of



salmon from river populations and fisheries throughout the North Atlantic. A sum of up to £5,000 was agreed.

- 4.4 The Board agreed to the approach recommended by the SAG for seeking and prioritising research proposals that might be funded by the Board or for which the Board may support the proposer in seeking funds from other sources. Under this approach the Secretary would write to members of the Board no later than 31 July each year requesting that proposals for research be submitted to the Secretariat. Any proposals received by 1 September would be evaluated and prioritised by the nominated SAG representatives using the guidance developed previously by the Board. The Board recognised that the results of the work by the Sub-Group referred to in paragraph 4.2 above should assist the SAG nominees in identifying research gaps and priorities.
- 4.5 The SAG had noted that concerns had been expressed by NASF about the proposal to extend the West Greenland Sampling Programme. The SAG had recommended that this matter be considered by the Board and the West Greenland Commission but had fully supported the programme as a source of valuable scientific information for the SALSEA Programme. Under the current international sampling programme samples of salmon are purchased from open markets and hospitals, etc. For the extended programme there would be a need to purchase additional whole fish for stomach contents, stable isotope, disease and lipid analyses. While salmon harvested in the internal use fishery are required to be gutted before landing in Greenland arrangements are in place for whole fish to be landed for the current sampling programme. For the extended programme, it is estimated that with six samplers operating in three regions the maximum number of fish that could be sampled might be 900 but more likely to be within the range 300 – 900, and in the first year probably around 500 fish compared to an internal use harvest of approximately 8,000 fish in 2007. It was thought that with good coordination and cooperation between the samplers, the fishermen and KNAPK the samples required could be made available from within the current internal use harvest. The Board recognized that there were concerns that the extended sampling would result in additional harvests and that a financial incentive might seem to encourage this. However, the research at West Greenland is vitally important and it was suggested that the fish could be made available for consumption once the necessary samples had been collected. It was also noted that because of mortalities between West Greenland and homewaters the actual loss to homewater stocks would be less than the number of fish sacrificed for the sampling programme. It was recognized that cooperation of the organizations in Greenland and the Parties to the Greenland Agreement was vital if this important research is to proceed. The NGOs offered to support the Board in addressing the concerns about the extended sampling programme.

## **5. The SALSEA Programme**

### **(a) Review of progress in implementing SALSEA**

- 5.1 The Chairman referred to the launch of the SALSEA-Merge project in April 2008. This three-year project involves a public-private partnership of twenty organizations and has an ambitious set of deliverables. There will be three marine surveys in both 2008 and 2009 conducted by Irish, Faroese and Norwegian vessels. The Faroese and Irish surveys are to areas where post-smolts have been found in the past but the Norwegian surveys will explore new areas in an attempt to discover more about the distribution of northern stocks which have higher marine survival than southern stocks. While the genetic stock identification work has attracted considerable attention, the project will also involve the development of innovative migration models.
- 5.2 Gerald Chaput reported that under the SALSEA-North America project a vessel had been secured for 24 days in August during which time pelagic trawls and surface drift nets will be deployed in the Labrador Sea. Oceanographic and plankton sampling will be conducted and an acoustic detector will be deployed. The marine surveys will be combined with index river work and sampling at West Greenland. The aim is to better understand the salmon's role in the pelagic ecosystem and the factors influencing it in the marine environment. It is an international effort with support from NOAA in the USA. It was noted that the sampling at West Greenland is also a significant programme with annual expenditure of around \$200,000 per annum.
- 5.3 It was noted that following the Board's genetics symposium and workshop in Paris in February the geneticists had expressed interest in becoming fully involved in the SALSEA initiative and the Chairman indicated that other research groups would also be welcome to participate.

### **(b) Review of progress in promoting SALSEA**

- 5.4 The Chairman referred to the considerable momentum that had developed as a result of the implementation of the SALSEA-Merge, SALSEA-North America and SALSEA-West Greenland initiatives. He believed that this should assist the Board in raising the funds needed to complete the remaining areas of research under the SALSEA Programme. While considerable resources are available to study marine growth using new and historical scale samples the analysis of freshwater growth remained to be assessed, but would be facilitated by the availability of digitised scale samples. The NGOs with research briefs such as the AST and ASF could be of assistance in addressing the remaining research areas under the SALSEA Programme. The Board has established relationships with, for example, the TOTAL Foundation, Pew Foundation and the Ocean Foundation that could be further developed. It was, however, recognized that while the Board may develop its priority areas for research these may not necessarily align with those of funders.
- 5.5 The NGOs indicated that they would be willing to assist the Board in promoting the SALSEA Programme and that more effort was needed with regard to media relations. It was felt that the SALSEA Programme could greatly raise NASCO's profile if a

well planned PR strategy was developed although it may be that the media coverage would be local rather than general. It was recognized that the Board's website needed to be further developed to provide more background to the issues since it is rather technical and needs to have a greater educational content to appeal to the general public and schools. In particular the genetics work could be used to highlight the plight of salmon at sea for fish from particular river systems and this should assist fund-raising efforts. There may also be a link to the 'follow the fleet website' which will include a SALSEA component and there could be visual map displays. The Board welcomed the offer of support from the NGOs and noted that this issue would be considered further during the Council meeting.

(c) Coordination of European and North American elements of SALSEA

- 5.6 The Board endorsed the recommendations of the SAG on an initial approach to improving coordination of the SALSEA-Merge and SALSEA-North America projects. This approach would involve the research coordinators (Jens Christian Holst, Gerald Chaput and Tim Sheehan) exchanging experience and results as soon as possible after each marine survey and reporting back to the SAG. Consideration could also be given to exchanges of scientists working in the North-East and Northwest Atlantic. The importance of disseminating the results of the projects to a wide audience was stressed in order to convey the progress being made to support future fund-raising initiatives.

**6. Finance and administrative issues**

- 6.1 A brief report on the work of the Atlantic Salmon Conservation Foundation was presented by its Executive Director, Stephen Chase. The Foundation administers a CAN\$30million trust fund established by the Canadian government with the goal of supporting projects that improve conservation and management of wild Atlantic salmon and its habitats through community partnerships at the watershed level. In 2008 the first call for proposals had been announced with the aim of soliciting high quality proposals consistent with the Foundation planned priorities. A total of CAN\$300,000 had been made available with a further call in November 2008 for funding in 2009. Tim Sheehan reported that an application to the Foundation had been made for funding to support genetic analysis of samples collected at West Greenland to at least region of origin.
- 6.2 At its 2006 meeting the Board had recognized that there are significant costs in having the accounts audited annually and agreed that, in future, the Board's accounts should be audited every two years, commencing with the 2007 financial statements. For years in which an audit is not conducted, details of the Board's income and expenditure statements will be circulated to the members of the Board and discussed at its Annual Meeting. However, following consultations with the Members of the Board, it had been agreed that there should not be an audit of the 2007 accounts because of the very small number of transactions during the year and because an audit would have cost in the region of £1,000. The Secretary reported that in accordance with this decision, financial statements for the year to 31 December 2007, ICR(07)3, had been sent to all Members of the Board. These indicated a year-end balance of about £90,000. An audit will be conducted of the 2008 accounts.

- 6.3 The Board considered a proposal from the Chair to make budgetary provision of £20,000 in 2009 and 2010, ICR(08)4. He indicated that the Board is now entering a new phase in which there will be additional duties associated with attendance at meetings, communications and public relations work. There may also be work involved in ensuring coordination of the marine surveys in the North-East and Northwest Atlantic and in seeking additional funding for the remaining elements of the SALSEA programme. He suggested that the public relations aspects of the marine survey programme are likely to bring considerable benefits not only to the IASRB but also to NASCO in terms of media interest and raised profile of the organization, but at present the IASRB has no funds to cover any of these aspects and the funds it has are fully committed.
- 6.4 The Board asked the Chairman to write to all interested Parties indicating that the Board was seeking financial support for promoting its work.

## **7. Other Business**

- 7.1 There was no other business.

## **8. Report of the Meeting**

- 8.1 The Board agreed a report of its meeting.

## **9. Date and Place of Next Meeting**

- 9.1 The Board decided to agree the date and place of its next meeting by correspondence.
- 9.2 The Chairman thanked participants for their contributions and closed the meeting.

*List of Participants*

**Canada**

Guy Beaupré  
Peter Cronin  
Gerald Chaput  
Bud Bird  
Dave Reddin  
Robert Allain

**Denmark (in respect of the Faroe Islands and Greenland)**

Andras Kristiansen  
Jan Arge Jacobsen

**European Union**

Staffan Ekwall  
Ted Potter  
Trevor Hastings  
Ken Whelan (Chairman)  
Aleksandra Kordecka

**Iceland**

Arni Isaksson

**Norway**

Arne Eggereide  
Raoul Bierach  
Lars Petter Hansen

**Russian Federation**

Boris Prischepa  
Elena Samoylova  
Svetlana Krylova  
Igor Studenov

## **USA**

Mary Colligan  
Tim Sheehan

## **NGO Representatives**

Chris Poupard  
Tony Andrews  
Paul Knight  
Steven Chase  
Niall Greene  
Dick Shelton

## **Secretariat**

Malcolm Windsor  
Peter Hutchinson

**International Atlantic Salmon Research Board**

**ICR(08)6**

***Agenda***

1. Opening of the meeting
2. Adoption of the agenda
3. Inventory of Research
4. Report of the Scientific Advisory Group
5. The SALSEA Programme
  - (a) Review of progress in implementing SALSEA
  - (b) Review of progress in promoting SALSEA
  - (c) Coordination of European and North American elements of SALSEA
  - (d) Future actions
6. Finance and administrative issues
7. Other business
8. Report of the meeting
9. Date and place of next meeting

**SAG(08)4**

***Report of the Meeting of the Scientific Advisory Group of the  
International Atlantic Salmon Research Board***

***Tryp Rey Pelayo Hotel Melia, Gijón, Spain  
Sunday, 1 June, 2008***

**1. Opening of the Meeting**

- 1.1 The Chairman, Dr Lars Petter Hansen (Norway), opened the meeting and welcomed participants to Gijón. He extended a particular welcome to the NGO representatives who have made valuable contributions to the SALSEA Programme. He thanked the Spanish hosts for the arrangements made for the meeting and referred to the significant progress made in implementing the SALSEA Programme since the Group's last meeting.
- 1.2 A list of participants is contained in Annex 1.

**2. Adoption of the Agenda**

- 2.1 The SAG adopted its agenda, SAG(08)2 (Annex 2).

**3. Election of Officers**

- 3.1 The SAG unanimously re-elected Dr Lars Petter Hansen as its Chairman for a further period of two years.

**4. Review of the updated inventory of research**

- 4.1 The Assistant Secretary provided an overview of the updated inventory of research relating to salmon mortality in the sea, ICR(08)2, which is considered by the Board to be an essential tool in identifying research gaps and priorities, in improving coordination of existing research and in support of promotion of SALSEA. For 2008, 55 ongoing projects had been included in the inventory and the annual expenditure on these projects was approximately £6.7million, an increase of 32% from 2007. Costings had been provided for all the ongoing projects. During the year, there had been considerable progress in obtaining funding for the marine surveys envisaged under Workpackage 3 of the SALSEA Programme. In particular, the SALSEA-Merge project, a £4.4 million three year study involving three marine surveys by Irish, Norwegian and Faroese research vessels in both 2008 and 2009 had been launched on 16 May 2008. In addition, the Canadian government had committed approximately



£0.4 million to a twenty-four day research survey in the Northwest Atlantic in late August 2008. These two new projects were the main reason for the increased expenditure in 2008. There has also been progress in implementing additional sampling of the West Greenland fishery. The inventory had been made available to the ICES Working Group on North Atlantic Salmon (WGNAS) to assist it in identifying data deficiencies, monitoring needs and research requirements.

- 4.2 The SAG welcomed the valuable information presented in the inventory but agreed that consideration should be given to how this information could be better utilised. The SAG therefore recommends to the Board that it should establish a Sub-Group of the SAG comprising at least one representative from each Party. The Terms of Reference for this Sub-Group should be to review the inventory to identify areas where there may be merit in encouraging improved coordination of research and to highlight gaps in the research programme where new work might significantly benefit the SALSEA Programme and which might be considered for funding by the Board. The SAG recommends that the Sub-Group should work by correspondence under the Chairmanship of Ted Potter (European Union) and report back to the SAG.
- 4.3 The SAG recommends that the Parties be given an opportunity to provide any additional information to the Secretariat for inclusion in the inventory by 30 June and that after that date the inventory should be made available on the Board's website.

## **5. The SALSEA Programme**

### **(a) *Progress with implementing SALSEA***

#### **(i) Analysis of historical tagging data**

- 5.1 At 2007 meeting the SAG had reviewed the report of an ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas which had been held in St Johns, Newfoundland during 19-22 February 2007. The Board had supported this workshop by funding the participation of a GIS expert and this had been extremely useful in facilitating the group's work.
- 5.2 The SAG had recognized that analysis of historical tag recovery information could improve understanding of salmon distribution and migration at sea and, therefore, benefit the SALSEA programme. On the recommendation of the SAG, the Board had agreed to:
- encourage the Parties to compile historical tagging information using the format developed by the ICES Workshop;
  - ask that NASCO request ICES to compile, on an annual basis, tag recovery information and report on the status of analysis of historical tag recovery data;
  - fund the participation of a GIS expert and oceanographer at any follow-up workshop convened by ICES and that a sum of up to £5,000 be made available to support such participation;
  - make the spreadsheet format for compiling historical tag recovery information available on the Board's website.

- 5.3 The Chairman reported that ICES has convened a follow-up Workshop on Salmon Historical Information – New Investigations from Old Tagging Data to be held in Halifax, Canada from 18 – 20 September 2008 immediately prior to the ICES Annual Science Conference. The objectives of this follow-up Workshop will include:
- providing further information from historical oceanic tagging and recovery programmes in the format agreed at the first workshop;
  - updating the database of tagging and tag recovery information established at the first workshop;
  - developing and testing hypotheses of salmon migration and behaviour using information compiled at the first workshop and any new information that becomes available; and
  - using the information to describe the distribution of salmon of different river origins and sea age in time and space and assessing changes in the distribution over time in relation to hydrographical factors.
- 5.4 The SAG recommends that the Board encourage countries to make available to the Workshop any relevant tagging data using the agreed template. It was suggested that in the case of microtag recoveries at West Greenland, the countries in which the tags were applied should provide the data and that there was a need for some coordination among those countries prior to the Workshop. This would be led by the CEFAS laboratory in the UK which serves as the clearing house for microtags recovered at West Greenland.
- (ii) Progress on stable isotope analysis of West Greenland samples
- 5.5 One-sea-winter salmon from both North America and the North-East Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Understanding of the marine ecology of these fish can be advanced through studies of trophic state and condition through analysis of lipid and stable isotope ratios. In 2007, the Board agreed to support a preliminary study at West Greenland with an emphasis on comparisons between the continent of origin. The questions that were to be addressed in the project included:
- are trophic states of 1SW non-maturing fish similar between NAC and NEAC origin salmon?
  - are trophic states of 1SW non-maturing fish different from those of 1SW maturing fish of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?
  - has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?
- 5.6 The same questions would be examined for lipid content to assess fish condition and how this influences survival. A report on this study was presented by Gerald Chaput (Canada). This report is contained in Annex 3. The initial results from this first year of work indicate that there are slight but consistent differences in condition (weight at given length) and relative lipid content (C:N ratio) between 1SW non-maturing salmon from NEAC and NAC at the actively feeding and growing life stage at West Greenland. NEAC fish had higher relative lipid content in both the liver and the

muscle than the NAC fish. Both groups were more lipid rich than the maturing 1SW fish from the Miramichi. Differences noted in the isotope ratio of N between fish at West Greenland and the maturing 1SW salmon in the Miramichi may reflect differences in trophic feeding state or differences in feeding status of fish. Follow-up studies would be valuable.

- 5.7 Mr Tim Sheehan (USA) referred to the international sampling programme for the West Greenland fishery. This programme provides a very valuable method of obtaining samples of both European and North American origin salmon without the need for research vessel time. Under the SALSEA Programme it had been suggested that this sampling programme be extended and he reported that consideration was being given to purchasing a small number of whole salmon from the fishermen to enable stomach content, disease and stable isotope analyses to be conducted. It is anticipated that the number of whole fish that would be obtained would be in the range of 300 – 900 compared to a total subsistence harvest of around 8,000 salmon in 2007. However, concerns had been raised by NASF that this proposed extended sampling could lead to increased harvests at West Greenland. The SAG recommends that this matter be considered further by the Board and the West Greenland Commission but fully supports the proposed extended sampling as a source of valuable scientific information for the SALSEA Programme.

(iii) Report on the SALSEA-Merge Project

- 5.8 Dr Jens Christian Holst, the Scientific Coordinator of the SALSEA-Merge project, presented a progress report on this £4.4 million three year project. The project had commenced on 1 April 2008 and involves three marine surveys by Irish, Faroese and Norwegian vessels in both 2008 and 2009. The origin of post-smolts sampled will be identified using genetic stock identification methods. In February 2008, the Board had organised a symposium and workshop in Paris, with funding from the TOTAL Foundation, to consider the way forward for defining a practical framework and strategy for the development of an appropriate suite of genetic markers and the integration of existing data sets and new regional markers into European, North American and trans-Atlantic databases. A further meeting is scheduled for July to resolve inter-laboratory calibration and the suite of markers to be used. In May, two marine surveys had been conducted by Irish research vessels and more than 430 post-smolts had been captured. Fin-clipped and microtagged salmon had been observed. The project had started very successfully and there will be further surveys in July and August. There had been interest in the results of the surveys from scientists working on pelagic species.

(iv) Report on plans for marine surveys in the north-west Atlantic

- 5.9 A summary of SALSEA- North America was presented by Gerald Chaput. The research strategy comprises three inter-related activities building on the existing index river programme in eastern North America. These address life-history monitoring, electronic technologies and marine capture surveys. A marine survey will be conducted during 1 - 24 August using both pelagic trawling and surface gillnets deployed from the Canadian research vessel Wilfred Templeman and oceanographic data will be collected. The coordinators for this project are Gerald Chaput and Tim

Sheehan. Nearshore – offshore transects will be fished to coincide with existing ongoing oceanographic surveys

(v) Reports on sonic telemetry studies

- 5.10 The SAG had previously recognized that acoustic telemetry work can contribute valuable information on the migration and distribution of salmon at sea and that acoustic arrays are being located increasingly further offshore. A report on these ongoing studies is contained in the 2008 Report of the WGNAS. It was noted that there are plans through the Ocean Tracking Network to install acoustic arrays off Halifax, Nova Scotia (2008) and in the Cabot Strait, Newfoundland (2009). There is already an array across the Strait of Belle Isle. The Group was advised that an application for funding of the Coast Track project has been submitted to the European Commission.

(vi) Coordination of European and North American elements of SALSEA

- 5.11 The SAG noted the complementary nature of SALSEA-Merge and SALSEA-North America and highlighted the importance of establishing a mechanism for information exchange on a regular basis. In particular, the SAG recommends that the research coordinators (Jens Christian Holst, Gerald Chaput and Tim Sheehan) should exchange experience and results, as soon as possible, after each marine survey and to report back to the SAG. Consideration might also be given to the possibility of an exchange of personnel between the SALSEA-Merge and SALSEA-North America projects. The importance of disseminating the results of these projects to a wide audience was also stressed in order to convey the progress being made to support future fund-raising initiatives.

(vii) 2010 Symposium

- 5.12 The Board had previously agreed to co-convene with ICES and the North Pacific Anadromous Fish Commission (NPAFC) an international symposium on mortality of salmon at sea in the North Atlantic and North Pacific Oceans. This ‘salmon summit’ had initially been scheduled for 2010 and NPAFC had indicated a preference for a meeting in the spring. However, as the SALSEA-Merge project will not be completed until April 2011 the SAG recommends to the Board that the symposium be scheduled for the spring of 2011. In the interim, however, the Board had agreed that there would be benefits from a continuing exchange between scientists working on these issues in the North Pacific and North Atlantic Oceans. To this end, representatives of NPAFC had been invited to participate in a Special Session on salmon at sea held during NASCO’s Twenty-Fourth Annual Meeting in June 2007 and NASCO scientists would be invited to participate in the NPAFC BASIS Symposium to be held in Seattle in November 2008. The deadline for submitting abstracts is 30 June 2008. The Secretary had proposed to NPAFC that NASCO would be willing to provide an overview of the SALSEA Programme just as the NPAFC Secretariat had reported on its science programme at NASCO’s 2007 meeting. The SAG recommends to the Board that it should appoint representatives to the symposium Steering Committee and suggests these should be the Secretary of NASCO (Dr Malcolm Windsor, Co-Convenor), the Assistant Secretary (Dr Peter

Hutchinson), the Chairman of the SAG (Dr Lars Petter Hansen), the SALSEA-Merge Scientific Coordinator (Dr Jens Christian Holst) and a representative of the SALSEA-North America project (to be confirmed). The SAG noted that Mr David Reddin (Canada) was willing to serve in this capacity and welcomed this offer.

(viii) Other activities

5.13 There were no other reports on activities under the SALSEA Programme.

**(b) *Progress with promoting SALSEA***

5.14 The Chairman of the Board presented a brief overview of activities in promoting the SALSEA-Programme, funding for which is being sought through public-private initiatives. Further consideration will be given to this aspect by the Board. It was, however, noted that there was now considerable momentum in implementing the SALSEA Programme and that these achievements should assist in future efforts to raise additional funding. In particular, it was suggested that the analogy of the Atlantic salmon as an ‘aquatic canary’ was a powerful support to fund-raising efforts. It was noted that further developments of the Board’s website are planned including descriptions of the various SALSEA-Merge workpackages in layman’s terms and brief reports of the marine surveys in the form of a ‘Captain’s log’. A separate technical SALSEA-Merge website is under consideration.

**(c) *Recommendations to the Board on funding research***

5.15 Gerald Chaput presented two research proposals for funding from the Board. Details of these proposals are contained in Annex 4. These proposals were:

- a continuation of the study supported by the Board in 2007/2008 to examine any changes in trophic levels of Atlantic salmon through the marine phase of their life cycle. Funding is sought for analysis of samples of Can\$39,000 in 2008, Can\$55,900 in 2009 and Can\$26,400 in 2010;
- a new study into the temperature history of Atlantic salmon at sea based on oxygen isotope ratios in otoliths. Funding is sought of Can\$17,900 in 2008, Can\$28,800 in 2009 and Can\$15,240 in 2010.

5.16 Mr Ted Potter reported that the ICES Advisory Committee has recommended that efforts be continued to identify and collate further information on biological characteristics of salmon from river populations and fisheries throughout the North Atlantic. An ICES Study Group has been proposed and it was noted that there are scientists working in relevant research areas who may not easily be able to attend the proposed meeting. A proposal to support such participation is contained in Annex 5. The cost to the Board of supporting this Study Group would not exceed £5,000.

5.17 The SAG discussed mechanisms for supporting projects that might be considered for funding should resources be available. In addition to projects that might be funded directly by the Board, the Board could also play an important role in supporting the proposers of research projects in seeking funds from other sources. The SAG was made aware of possible interest in funding for projects related to the ongoing marine

surveys which had not been presented at its meeting. The SAG recommends that the Board adopt a procedure under which the Secretary would write to the Members of the Board by 31 July each year requesting that proposals for research funding be submitted to the Secretariat. Any proposals received by 1 September would be evaluated by the nominated SAG representatives and prioritized for funding. It was suggested that a maximum funding level for a single project of £50,000 might be considered by the Board. The SAG recommends that the Board's priority theme for funding should remain studies of the distribution and migration of salmon at sea and that the SAG nominees should take the Board's previous decisions concerning priority research topics into account when reviewing research proposals. The SAG also believes that the findings of the Sub-Group referred to in paragraph 4.2 above will be of assistance in prioritizing future research projects. In the interim, the SAG recommends that the Board consider funding the three projects described above if resources permit.

**6. Other business**

- 6.1 There was no other business.

**7. Report of the Meeting**

- 7.1 The SAG agreed a report of its meeting.

**8. Date and place of next meeting**

- 8.1 The SAG decided to agree the date and place of its next meeting by correspondence.

*List of Participants*

**Canada**

Bud Bird  
Gerald Chaput  
Dave Reddin

**Denmark (in respect of the Faroe Islands and Greenland)**

Jan Arge Jacobsen

**European Union**

Aleksandra Kordecka  
Ted Potter  
David Dunkley  
Niall O'Maoileidigh  
Ken Whelan

**Norway**

Lars Hansen (Chairman)

**Russian Federation**

Elena Samoylova

**USA**

Tim Sheehan

**NGO Representatives**

Dick Shelton  
Tony Andrews

**SALSEA-Merge Scientific Coordinator**

Jens Christian Holst

**NASCO Secretariat**

Peter Hutchinson

## *Agenda*

1. Opening of the meeting
2. Adoption of the agenda
3. Election of Officers
4. Review of the updated inventory of research
5. The SALSEA Programme
  - (a) *Progress with implementing SALSEA*
    - (i) Analysis of historical tagging data
    - (ii) Progress on stable isotope analysis of West Greenland samples
    - (iii) Report on the SALSEA-Merge project
    - (iv) Report on plans for marine surveys in the north-west Atlantic
    - (v) Reports on sonic telemetry studies
    - (vi) Coordination of European and North American elements of SALSEA
    - (vii) 2010 Symposium
    - (viii) Other activities
  - (b) *Progress with promoting SALSEA*
  - (c) *Recommendations to the Board*
6. Other business
7. Report of the meeting
8. Date and place of next meeting



**A FIRST LOOK AT DIFFERENCES IN TROPHIC LEVELS  
OF 1SW NON-MATURING ATLANTIC SALMON  
OF NAC AND NEAC ORIGIN**

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**INTRODUCTION**

Historical information on marine survival has revealed differences among maturing age groups, differences over time and within and between the continent of origin. Generally, survival rates are higher for northern populations relative to southern ones, are better for European fish relative to those from North America, and are higher in grilse stocks than in multi-sea-winter stocks. The role of prey available to salmon at sea in conditioning survival is not well understood but there is evidence for some stocks that marine survival is conditioned by growth at sea.

Atlantic salmon (*Salmo salar*) are opportunistic feeders during their freshwater and marine life-history phases. During the marine phase, salmon consume prey relative to their body size and as they grow, they consume prey in the upper end of the size spectrum with a preference for fish over crustaceans should both be available. The point in the life cycle when this change happens and the relative importance of these components is poorly understood. As well, maturing 1SW salmon do not undertake extensive feeding migrations to West Greenland in contrast to some of the non-maturing 1SW salmon and the prey community available to these maturing components should be different from the high seas migrants.

Although conventional stomach content studies provide insight into the prey which are consumed by salmon at sea, they only provide a snapshot of the prey consumed in the recent hours and provide no information on the importance of different prey to the growth of the animal. Variability in the trophic ecology of Atlantic can be examined from analyses of stable isotope signatures of carbon and nitrogen ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ). Nitrogen stable isotope analysis

provides a quantitative means to determine trophic level since nitrogen signatures from organism tissue are consistently 3 to 5‰ more enriched than dietary sources. Analysis of different tissues also provide information on recent, short term and long term feeding of animals as the assimilation rates differ among tissues.

One-sea-winter salmon from both North America and the northeast Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Analysis of stable isotope in tissues of these fish and comparatively of 1SW and 2SW maturing fish back in homewaters could advance our knowledge of the trophic state of salmon at sea. In particular, the following questions would be addressed:

- 1) are trophic states of 1SW non-maturing fish similar between NAC and NEAC origin salmon?
- 2) Are trophic states of 1SW non-maturing fish different from that of 1SW maturing of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?
- 3) Has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?

In 2007, this preliminary study was focused on comparing the stable isotope ratios in tissues of 1SW non-maturing salmon at West Greenland with an emphasis on the comparison between the continent of origin. A limited sampling program of 1SW maturing fish in the Miramichi River (Canada) provided insight into the stable isotope ratios in the maturing component of the same smolt cohort as the fish sampled at West Greenland in 2007.

## **MATERIALS AND METHODS**

A total of 150 fish were purchased as fresh fish in their whole state and sampled by the sampling team stationed in Nuuk (West Greenland). Tissue samples from liver, dorsal muscle and caudal tissue were placed in individual cryo-tubes and frozen. The samples were obtained over the period of Aug. 9 to Sept. 5 2007. Additional information obtained from these fish included fork length, whole weight, sex, scale samples for determining age, and tissue samples for genetic stock identification of the continent of origin.

Between Aug. 15 and Aug. 20 2007, thirteen maiden one-sea-winter salmon were sampled from the catches at the index trapnet in the estuary of the Southwest Miramichi River. Similar biological data to the West Greenland samples were obtained from these fish. The fish were fresh sampled for disease diagnostics using bits of tissue from gill filaments, pyloric caecum, spleen, and kidney. Pieces of liver, caudal fin, dorsal muscle (immediately below the dorsal fin), ventral muscle (directly in line with dorsal fin) and muscle from the caudal peduncle were extracted and frozen for stable isotope analysis.

### Stable isotope analysis

Stable isotope analysis was conducted by the Stable Isotope in Nature laboratory (SINLAB) at the Canadian Rivers Institute, University of New Brunswick (Fredericton, New Brunswick, Canada). Samples were analyzed for  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  using an isotope-ratio mass spectrometer interfaced with an elemental analyzer. The system was a continuous flow system using helium as a carrier gas. Carbon and nitrogen data were corrected with three international standards (CH6 (sucrose standard issued by the International Atomic Energy Agency with

$\delta^{13}\text{C} = -10.4\text{‰}$ ), N2 (ammonium sulfate standard issued by the International Atomic Energy Agency with  $\delta^{15}\text{N} = 20.3\text{‰}$ ), acetanilide (commercially available pure compound with  $\delta^{13}\text{C} = -33.2\text{‰}$  and  $\delta^{15}\text{N} = -1.1\text{‰}$ ) and three standards developed at SINLAB (nicotinamide (commercially available pure compound with  $\delta^{13}\text{C} = -34.2\text{‰}$  and  $\delta^{15}\text{N} = -1.8\text{‰}$ ), BLS (bovine liver standard developed by SINLAB with  $\delta^{13}\text{C} = -18.7\text{‰}$  and  $\delta^{15}\text{N} = 7.3\text{‰}$ ), SMB-M (smallmouth bass muscle developed by SINLAB with  $\delta^{13}\text{C} = -23.3\text{‰}$  and  $\delta^{15}\text{N} = 12.4\text{‰}$ )). All of these standards are calibrated against Pee Dee Belemnite carbonate (PDB) and atmospheric nitrogen (AIR) for carbon and nitrogen, respectively. The analysis of the standards indicates that the results are within an acceptable range of error (Table 1).

As part of the routine quality assurance / quality control (QA/QC), replicates were run on four of every 73 samples. Replicated delta values within 0.5‰ are considered adequate. There was more uncertainty in the C and N values among replicates for caudal fin tissue than for either muscle or liver samples but differences averaged less than 0.5‰ for all tissues except for C in caudal fin (Fig. 1).

To account for different lipid content of tissues and its effect on the carbon isotope ratios,  $\delta^{13}\text{C}$  values were normalized for lipid content following the procedure of McConnaughey and McRoy (1979) and as used by Dempson and Power (2004). The normalization allows for valid comparison among tissues and fish by removing the differential effects of lipid synthesis and storage, as lipids tend to be depleted for C isotopes relative to carbohydrates and proteins (McConnaughey and McRoy 1979). The normalized value for the carbon isotope ratio ( $\delta^{13}\text{C}'$ ) is calculated from the equations of McConnaughey and McRoy (1979):

$$\delta^{13}\text{C}' = \delta^{13}\text{C} + D * [-0.207 + 3.90 / (1 + 287 / L)]$$

$$L = 93 / [1 + (0.246 * \text{C:N} - 0.775)^{-1}] \text{ and,}$$

where  $\delta^{13}\text{C}$  is the measured carbon isotope ratio in the sample.

D is the isotopic difference between protein and lipid, assigned a value of 6‰

L is the relative lipid content, and

C:N is the measured carbon (%) to nitrogen (%) ratio in the sample.

McConnaughey and McRoy (1979) assumed that a C:N ratio of 4.0 was taken as a “normal” value for relative lipid such that  $\delta^{13}\text{C}'$  is less depleted (smaller negative value) for fatty (C:N > 4.0) tissue, and vice versa.

The samples were run without lipid extraction. To address the high lipid content in some tissues from the Miramichi, samples were rerun after lipid extraction.

## RESULTS

Genetic stock identification results of the 150 salmon sampled at West Greenland identified 139 fish of North American (NAC) origin and only 11 fish of northeast Atlantic (NEAC) origin (Table 2). The majority (96%) of the fish were non-maturing one-sea-winter (1SW) salmon with few maiden two-sea-winter salmon and repeat spawners.

The 1SW salmon from NAC and NEAC were of similar size and similar condition (weight to length) (Table 2; Fig. 2). The 1SW salmon sampled from the Miramichi were on average 5 cm shorter than the 1SW salmon at West Greenland and had a significantly lower condition than those at West Greenland (general linear model, log transformed length and weight, differences in intercept model); for a fish of 630 mm fork length, the predicted weight for the Miramichi 1SW salmon was 2,400 g (95% C.I. 2,260 to 2,540 g) compared to 2,850 g (2,800

to 2,890) for NAC origin 1SW salmon and 2,820 g (2,670 to 2,980 g) for NEAC origin 1SW salmon at West Greenland (Fig. 3).

There were sufficient samples of NAC origin salmon at West Greenland to examine changes in size and condition between 9 August and 5 September 2007. Mean fork length increased from about 620 mm in early to mid-August to 635 mm by the end of August / early September. There was a proportionally greater increase in weight than length over the same period; the predicted weight of a 630 mm 1SW salmon in the latter period was 13% greater than the weight of a fish of similar length in the early period (Fig. 3).

The higher condition of salmon sampled at West Greenland relative to that of 1SW salmon in the Miramichi is reflected in the higher relative lipid content of the liver and muscle tissues from the fish at West Greenland. The C to N ratios were on average highest in fish from NEAC, followed closely by those from NAC which were both much higher than the ratios in tissues of salmon from the Miramichi (Fig. 4). Liver tissue was the most lipid rich, followed by muscle and least of all fin tissue (Fig. 4). This was the case for both the NEAC and NAC fish at West Greenland. The least lipid rich tissues were from the 1SW maturing salmon sampled from the Miramichi with relative lipid values of 4 or less for muscle and fin tissue and between 4 and 5 for liver (Fig. 4).

Although there were differences among sampling periods in the C:N ratios of liver and fin tissue of NAC origin salmon at West Greenland, no directional temporal differences were noted.

### **Stable isotopes**

Among five tissues examined from the Miramichi River, the ventral muscle had the highest relative lipid content (C:N ratio), followed by liver, dorsal muscle, caudal peduncle muscle, and finally caudal fin (Table 3). There was no difference in normalized  $\delta^{13}\text{C}$  values among tissues but  $\delta^{15}\text{N}$  values were the most enriched in the caudal fin tissue and least so in the ventral muscle (Table 3).

Unnormalized  $\delta^{13}\text{C}$  values suggest differences between maturing 1SW salmon in Miramichi and 1SW non-maturing salmon at West Greenland but the differences disappear after normalization for relative lipid content (Table 4). Lipid normalized  $\delta^{13}\text{C}'$  values are essentially identical for NAC and NEAC origin 1SW salmon at West Greenland as well as for the Miramichi 1SW salmon (Table 4) reflecting a common carbon source (marine based) for these fish. These values are similar to those reported from 1SW salmon muscle tissue of fish sampled from Conne River (Dempson and Power 2004) and for salmon from the Exploits River (Doucett et al. 1999).

The measured  $\delta^{15}\text{N}$  values all three tissues were lowest for the NEAC fish, followed by the NAC fish at West Greenland and the most enriched for the 1SW salmon in the Miramichi (Table 4). The caudal fin was relatively lipid poor (C:N < 4.0) in all samples but the most important difference was in the  $\delta^{15}\text{N}$  values in the caudal fin tissue of the Miramichi which was enriched compared to fish at West Greenland.

Bivariate plots of the  $\delta^{13}\text{C}'$  and  $\delta^{15}\text{N}$  stable isotope ratios show a complete mix of the 1SW salmon from NEAC within the cloud of values for NAC in all three tissues examined (Fig. 5).

Liver and muscle had similar isotope ratios for C but both were depleted (fewer  $^{13}\text{C}$  isotopes) relative to caudal fin tissue (Fig. 5; Table 3). Nitrogen isotope ratios were similar in all three tissues, ranging between 9 and 13 ‰ (Fig. 5, 6; Table 4). Miramichi fish are in the upper end and enriched for N compared with fish at West Greenland (Fig. 6).

## DISCUSSION

The initial results from this first year of work indicates that there are slight but consistent differences in condition (weight at given length) and relative lipid content (C:N ratio) between 1SW non-maturing salmon from NEAC and NAC at the actively feeding and growing life stage at West Greenland. NEAC fish had higher relative lipid content in both the liver and the muscle than the NAC fish and both groups were substantially more lipid rich than the maturing 1SW fish from the Miramichi.

Differences noted in the isotope ratio of N between fish at West Greenland and the maturing 1SW salmon in the Miramichi may reflect differences in trophic feeding state or differences in feeding status of fish. Fasting animals have been shown to have stable isotope ratios which are distinct from those fed *ad libitum* with starved animals having tissues which are enriched for  $^{15}\text{N}$  (Doucett et al. 1999). However, Doucett et al. (1999) did not find  $^{15}\text{N}$  was enriched in the white muscle of anadromous and fasting Atlantic salmon during the spawning migration and overwintering. To resolve this, sampling maturing 1SW salmon at the earliest time in the spring and periodically through the return to the river would assist in resolving this question.

Fin tissue is a mixture of bone, muscle and cartilage and does not contain as much lipid as muscle or liver (Kelly et al. 2006). It is also considered to have slower turnover rates relative to muscle and liver and would be representative of the longer term integration of prey. In this study, the greatest difference between the maturing 1SW salmon in Miramichi and the non-maturing 1SW salmon at West Greenland was in the enrichment of  $^{15}\text{N}$  in the caudal fin tissue of the former. As such, the enrichment of the fin tissue for 1SW maturing salmon relative to the non-maturing component may represent actual differences in trophic level consumption. The results indicate an avenue of research which is worth pursuing and in particular, that should be matched with tissue sampling from 2SW maturing salmon from the same smolt cohort.

Stable isotope comparisons of salmon between continent of origin, between age at maturity should be examined further. Fin tissue (or scales) provide a non-lethal choice for sampling from returning adults at the 1SW and 2SW stages. Liver and muscle tissue samples would provide short term and medium term indicators of trophic status which would be useful for examining differences between 1SW non-maturing salmon at West Greenland based on the continent of origin.

**Table 1.** Results of standards tests at SINLAB.

| Standards    | Element               | Expected<br>(delta values<br>‰) | Derived values ( $\delta$ ‰) |           |    |
|--------------|-----------------------|---------------------------------|------------------------------|-----------|----|
|              |                       |                                 | Mean                         | Std. Dev. | N  |
| CH6          | $\delta^{13}\text{C}$ | -10.4                           | -10.50                       | 0.16      | 10 |
| N2           | $\delta^{15}\text{N}$ | 20.3                            | 20.47                        | 0.24      | 10 |
| acetanilide  | $\delta^{13}\text{C}$ | -33.2                           | -33.16                       | 0.18      | 97 |
|              | $\delta^{15}\text{N}$ | -1.1                            | -1.18                        | 0.24      | 97 |
| nicotinamide | $\delta^{13}\text{C}$ | -34.2                           | -34.24                       | 0.11      | 49 |
|              | $\delta^{15}\text{N}$ | -1.8                            | -1.77                        | 0.13      | 49 |
| BLS          | $\delta^{13}\text{C}$ | -18.7                           | -18.73                       | 0.10      | 48 |
|              | $\delta^{15}\text{N}$ | 7.3                             | 7.22                         | 0.14      | 48 |
| SMB-M        | $\delta^{13}\text{C}$ | -23.3                           | -23.23                       | 0.09      | 49 |
|              | $\delta^{15}\text{N}$ | 12.4                            | 12.44                        | 0.19      | 49 |

**Table 2.** Biological characteristics of salmon sampled at West Greenland and in the Miramichi River in 2007.

| Sea age        | Statistic      | NAC               | NEAC              | Miramichi          |
|----------------|----------------|-------------------|-------------------|--------------------|
| All            | N              | 139               | 11                |                    |
|                | Mean weight    | 2847              | 2747              |                    |
|                | (range)        | (1720 to 7220)    | (2160 to 3240)    |                    |
|                | Mean length    | 627               | 626               |                    |
|                | (range)        | (556 to 836)      | (584 to 664)      |                    |
|                | Percent female | 91%               | 64%               |                    |
|                | Mean date      | 18 Aug            | 17 Aug            |                    |
|                | (range)        | (9 Aug to 5 Sept) | (9 Aug to 5 Sept) |                    |
| 1SW            | N              | 134               | 10                | 13                 |
|                | Mean weight    | 2783              | 2762              | 1730               |
|                | (range)        | (1720 to 4080)    | (2160 to 3240)    | (968 to 2530)      |
|                | Mean length    | 623               | 625               | 567                |
|                | (range)        | (556 to 690)      | (584 to 664)      | (499 to 628)       |
|                | Percent female | 90%               | 70%               | 8%                 |
|                | Mean date      | 18 Aug            | 18 Aug            | 17 Aug             |
|                | (range)        | (9 Aug to 5 Sept) | (9 Aug to 5 Sept) | (15 Aug to 20 Aug) |
| 2SW maiden     | N              | 1                 |                   |                    |
|                | Weight range   | 7220              |                   |                    |
|                | Length range   | 832               |                   |                    |
|                | Percent female | 100%              |                   |                    |
|                | Date range     | 29 Aug            |                   |                    |
| Repeat spawner | N              | 4                 | 1                 |                    |
|                | Weight range   | 2840 to 6190      | 2600              |                    |
|                | Length range   | 620 to 836        | 631               |                    |
|                | Percent female | 100%              | 0%                |                    |
|                | Date range     | 13 Aug to 29 Aug  | 10 Aug            |                    |

**Table 3.** C:N ratio,  $\delta^{13}\text{C}$ , normalized  $\delta^{13}\text{C}$  ( $\delta^{13}\text{C}'$ ), and  $\delta^{15}\text{N}$  values of five tissues from 1SW salmon sampled from the Miramichi River, 2007.

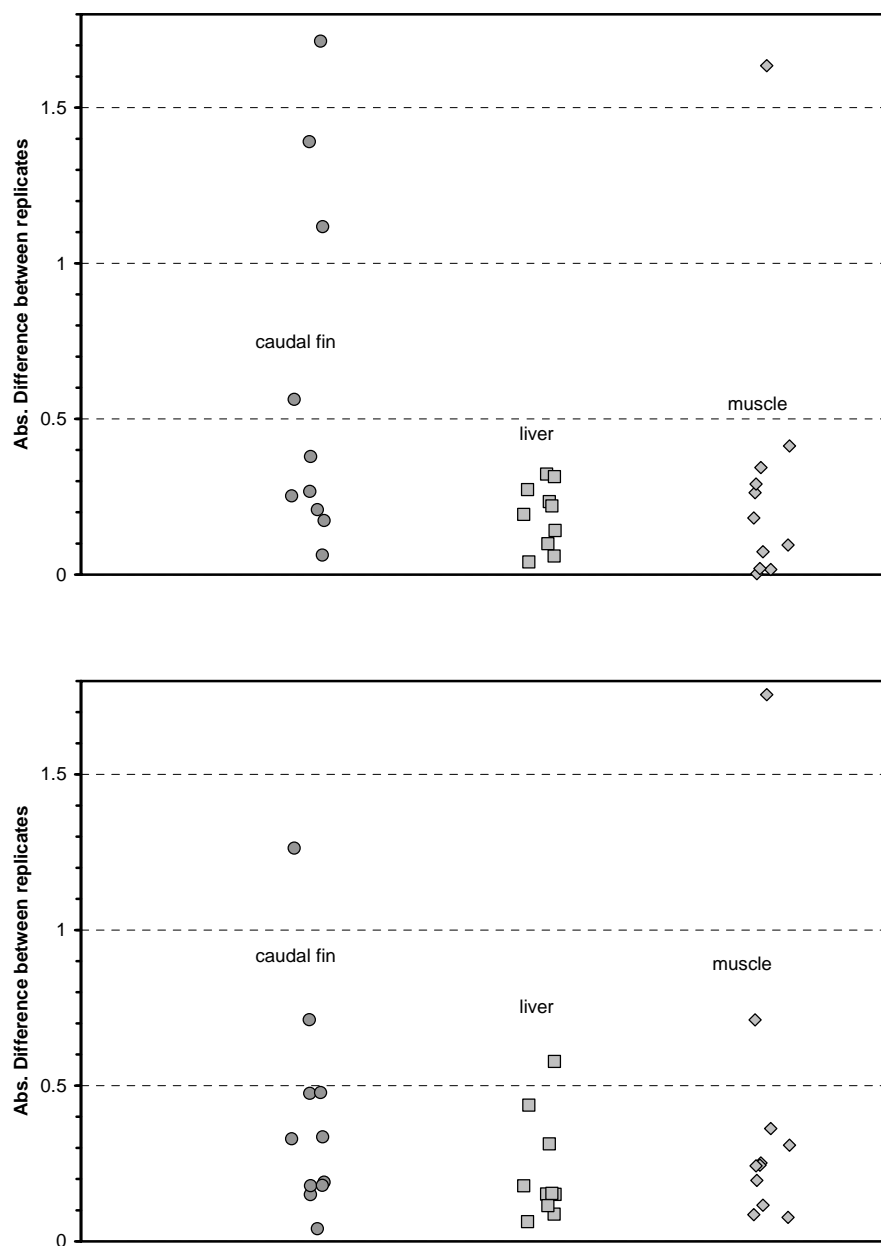
|  | Liver  | Muscle<br>ventral | Muscle<br>dorsal | Muscle<br>caudal | Caudal fin |
|--|--------|-------------------|------------------|------------------|------------|
| <b>C:N</b>                               |        |                   |                  |                  |            |
| N  | 13     | 13                | 13               | 13               | 13         |
| Mean                                     | 4.53   | 6.20              | 3.83             | 3.59             | 3.08       |
| Std. deviation                           | 0.80   | 2.08              | 0.40             | 0.38             | 0.18       |
| <b><math>\delta^{13}\text{C}</math></b>  |        |                   |                  |                  |            |
| Mean                                     | -20.47 | -21.19            | -19.84           | -19.50           | -18.03     |
| Std. deviation                           | 0.43   | 0.93              | 0.42             | 0.51             | 0.50       |
| <b><math>\delta^{13}\text{C}'</math></b> |        |                   |                  |                  |            |
| Mean                                     | -20.03 | -19.87            | -20.10           | -20.09           | -19.42     |
| Std. deviation                           | 0.27   | 0.37              | 0.21             | 0.22             | 0.28       |
| <b><math>\delta^{15}\text{N}</math></b>  |        |                   |                  |                  |            |
| Mean                                     | 12.10  | 11.71             | 12.13            | 12.41            | 13.14      |
| Std. deviation                           | 0.72   | 0.75              | 0.58             | 0.54             | 0.75       |



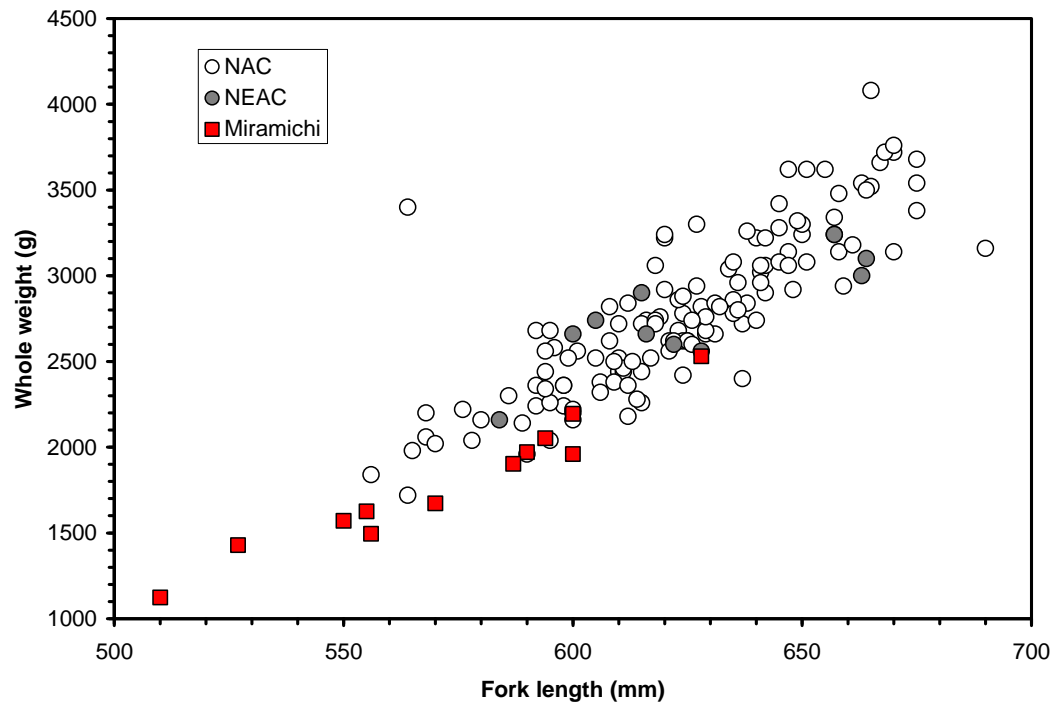
**Table 4.** C:N ratio,  $\delta^{13}\text{C}$ , normalized  $\delta^{13}\text{C}$  ( $\delta^{13}\text{C}'$ ), and  $\delta^{15}\text{N}$  values in three tissues of 1SW salmon at West Greenland by continent of origin and from the Miramichi River, 2007.

|  |                | NEAC   | NAC    | Miramichi |
|--|----------------|--------|--------|-----------|
| <b>C:N</b>                               |                |        |        |           |
| Caudal fin                               | N              | 10     | 134    | 13        |
|  | Mean           | 3.69   | 3.66   | 3.08      |
|  | Std. deviation | 0.44   | 0.67   | 0.18      |
| Muscle                                   | N              | 10     | 133    | 13        |
|  | Mean           | 5.79   | 4.99   | 3.83      |
|  | Std. deviation | 1.22   | 1.30   | 0.40      |
| Liver                                    | N              | 10     | 134    | 13        |
|  | Mean           | 6.36   | 5.68   | 4.53      |
|  | Std. deviation | 0.87   | 0.98   | 0.80      |
| <b><math>\delta^{13}\text{C}</math></b>  |                |        |        |           |
| Caudal fin                               | Mean           | -18.95 | -18.94 | -18.03    |
|  | Std. deviation | 0.69   | 0.99   | 0.50      |
| Muscle                                   | Mean           | -22.17 | -21.37 | -19.84    |
|  | Std. deviation | 0.82   | 0.79   | 0.42      |
| Liver                                    | Mean           | -21.97 | -21.62 | -20.47    |
|  | Std. deviation | 0.26   | 0.53   | 0.43      |
| <b><math>\delta^{13}\text{C}'</math></b> |                |        |        |           |
| Caudal fin                               | Mean           | -19.41 | -19.49 | -19.42    |
|  | Std. deviation | 0.26   | 0.46   | 0.28      |
| Muscle                                   | Mean           | -20.90 | -20.63 | -20.10    |
|  | Std. deviation | 0.22   | 0.25   | 0.21      |
| Liver                                    | Mean           | -20.33 | -20.37 | -20.03    |
|  | Std. deviation | 0.21   | 0.24   | 0.27      |
| <b><math>\delta^{15}\text{N}</math></b>  |                |        |        |           |
| Caudal fin                               | Mean           | 10.98  | 11.32  | 13.14     |
|  | Std. deviation | 0.73   | 0.63   | 0.75      |
| Muscle                                   | Mean           | 11.23  | 11.56  | 12.13     |
|  | Std. deviation | 0.61   | 0.53   | 0.58      |
| Liver                                    | Mean           | 10.54  | 10.78  | 12.10     |
|  | Std. deviation | 0.75   | 0.60   | 0.72      |

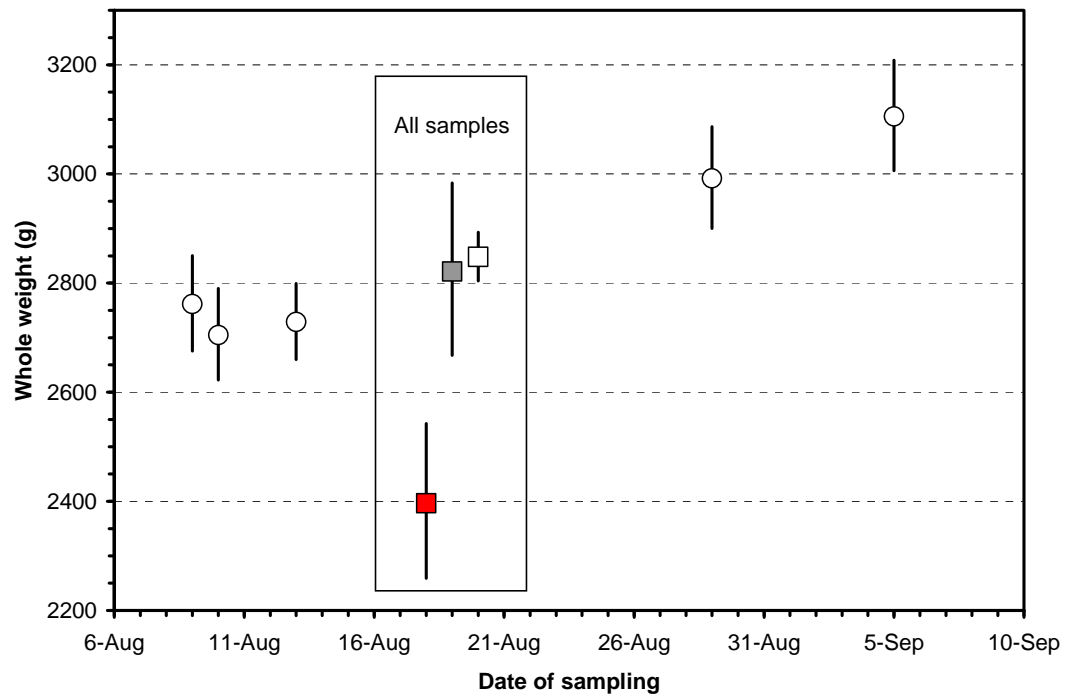
**Figure 1.** Differences (absolute) in delta values (‰) between replicate analyses for  $\delta^{13}\text{C}$  (upper panel) and  $\delta^{15}\text{N}$  (lower panel) for caudal fin, liver and dorsal muscle samples. Results within 0.5 ‰ are considered acceptable.



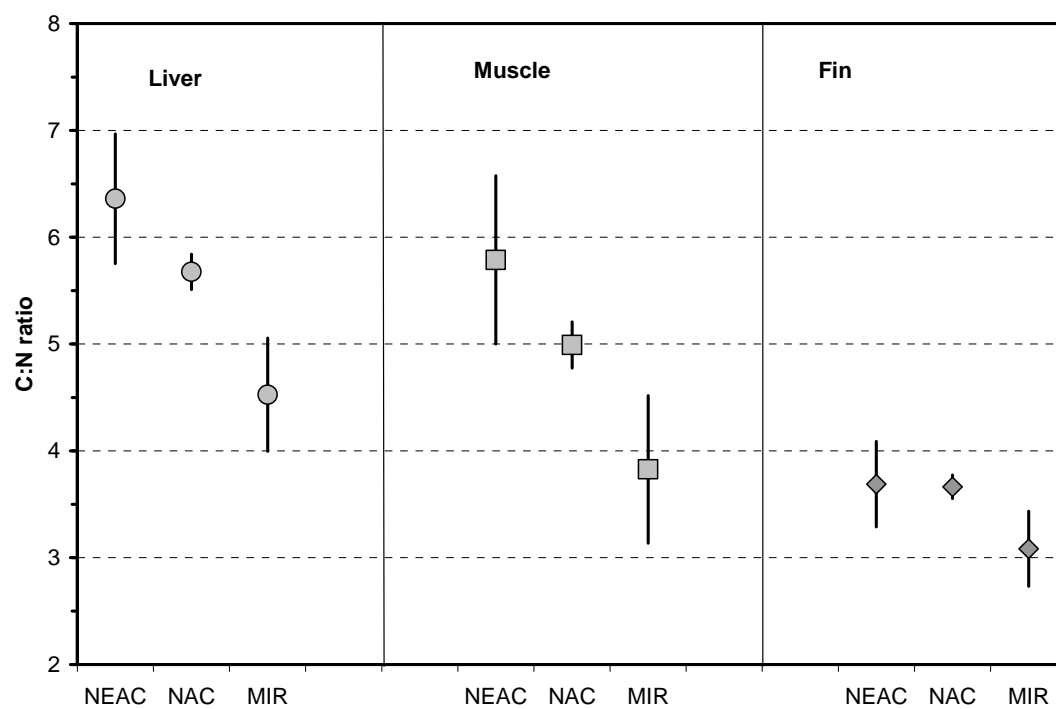
**Figure 2.** Fork length (mm) to whole weight (g) relationship for 1SW salmon from North America (NAC), Europe (NEAC), and Miramichi in 2007. Only salmon of one-sea-winter sea age are shown.



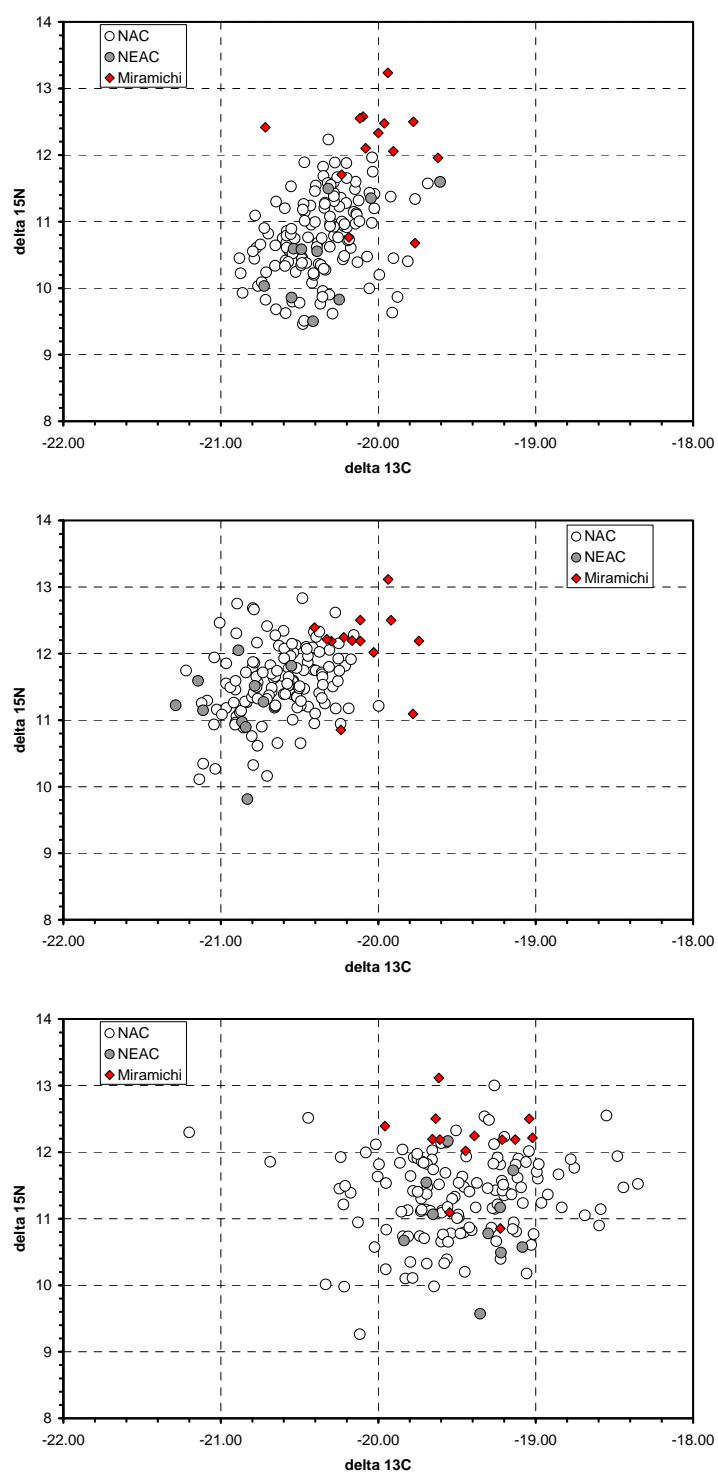
**Figure 3.** Predicted whole weight (g, with two standard error bars) of 1SW salmon measuring 630 mm fork length over all samples (square symbol) for NAC (white shading), NEAC (grey shading), and Miramichi (red shading) as well as predicted weight by sampling date for NAC 1SW salmon (circles, white shading).



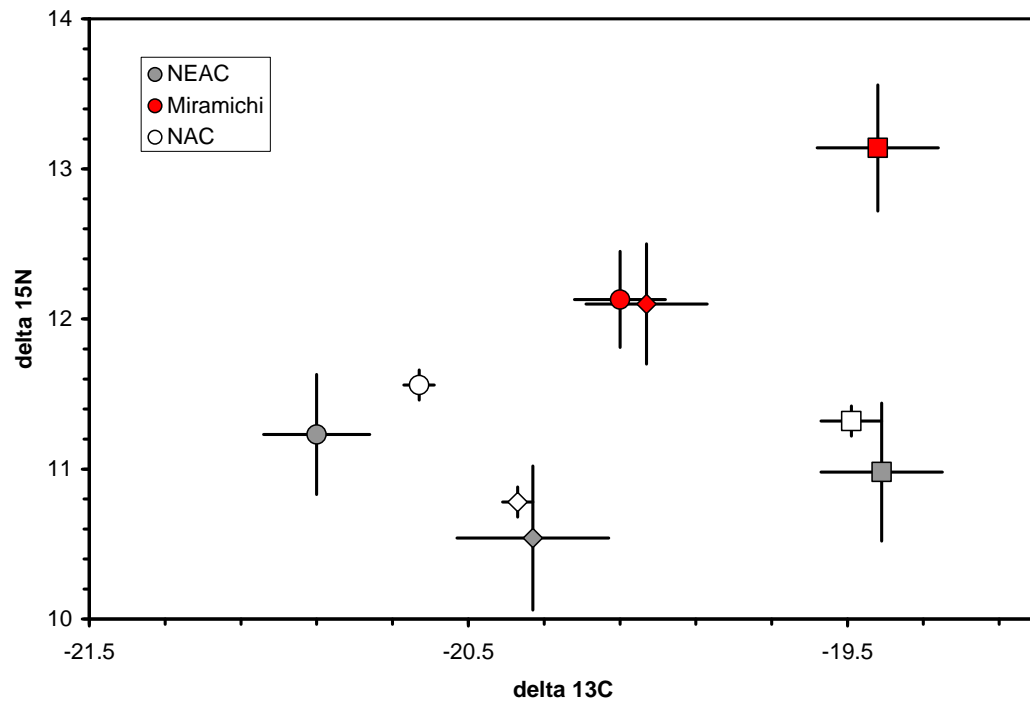
**Figure 4.** Carbon (%) to nitrogen (%) ratio (C:N) in tissues of 1SW salmon of NEAC and NAC origin captured at West Greenland and 1SW salmon sampled from the Miramichi River, 2007. The higher the ratio, the higher the relative lipid content.



**Figure 5.** Association between  $\delta^{13}\text{C}$  to  $\delta^{15}\text{N}$  in liver (upper), dorsal muscle (middle), and caudal fin (lower) tissues from 1SW maiden salmon of North American and European origin at West Greenland and from the Miramichi River, 2007.



**Figure 6.** Mean ( $\pm$  2 standard errors) of the stable isotope ratios of C and N in liver (diamond), dorsal muscle (circle), and caudal fin (square) tissue of 1SW non-maturing salmon at West Greenland (NEAC, NAC) and maturing 1SW salmon from the Miramichi River, 2007.



**Proposal submitted to the International Atlantic Salmon Research Board relative to  
furthering the knowledge on marine ecology of Atlantic salmon.**

**June 2008**

**By**

**Gérald Chaput, Tim Sheehan, and Brian Dempson  
SALSEA North America**

**CHANGES IN TROPHIC LEVELS OF ATLANTIC SALMON  
THROUGH THE MARINE PHASE OF THEIR LIFE CYCLE**

The following proposal for funding for 2008 is to analyze tissue samples from Atlantic salmon collected at index rivers in eastern Canada, as post-smolts in the northwest Atlantic, and as non-maturing 1SW salmon at West Greenland.

Costs associated with sample collection are covered by existing and new initiatives independent of this proposal.

**Context**

While the issue of Atlantic salmon survival is complicated by their complex life cycle requirements, there are various hypotheses regarding survival and production that may pertain to variations in Atlantic salmon abundance. One hypothesis stresses the implications of trophic structure and anthropogenic disturbances of trophic structure that have led to shortened food chains at sea. Hence, the need for investigations of variability in the trophic ecology of salmon. Trophic level can be evaluated by an examination of stomach contents over time, or through stable isotope analysis (SIA). While stomach contents provide a snapshot of recent dietary resource use, stable isotope analyses yield time integrated measures of energy assimilation since analyses are performed on body tissues built from diet assimilated over time. Consequently, SIA has been increasingly used in ecological studies as a reliable means of inferring trophic status and the impacts of anthropogenic disturbance on trophic relationships.

Atlantic salmon are considered opportunistic feeders during their freshwater and marine life-history phases. While in freshwater, juvenile salmon feed on aquatic invertebrates particularly various stages of insect groups. Differences in feeding strategies may occur between systems where parr rear extensively in lacustrine (lake) habitats versus other locations where fluvial (stream) rearing is common. During the marine phase, salmon often target prey in the upper end of the size spectrum with a preference for fish over crustaceans should both be available, but the point in the life cycle when this change happens and the relative importance of these components is poorly understood. Thus, owing to the opportunistic nature of salmon feeding habitats, the species lends itself well to studies associated with aquatic environmental conditions and food web interactions. This is



particularly relevant given the variability in freshwater habitats and differences in smolt size throughout Atlantic Canada, and the potential variation in ocean climate conditions that salmon encounter when first migrating to sea over a geographic range that extends from southern Nova Scotia and New Brunswick to Labrador and into the Ungava region of Quebec.

Variability in the trophic ecology of Atlantic will be examined from analyses of stable isotope signatures of carbon and nitrogen ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ). Nitrogen stable isotope analysis provides a quantitative means to determine trophic level since nitrogen signatures from organism tissue are consistently 3 to 5‰ more enriched than dietary sources. In contrast, carbon stable isotopes are conserved up the food chain owing to the slight 0.0 to 1.0‰ enrichment occurring between prey and consumer. Because  $^{13}\text{C}$  is conserved during trophic transfer, but varies at the base of the food web, consumer tissue stable isotope signatures will also reflect dietary source information. Various tissues have been used in the analysis of isotopic signatures, including muscle, liver, scales, and fins. Scales tend to provide a longer term perspective of trophic information while analyses of muscle and liver tissue reflect more recent energy assimilation.

We propose to sample salmon at various points in its life cycle and characterize variations and changes in trophic state from the smolt to adult life-stage. This will be accomplished by sampling smolts and adult survivors back to the river from a broad geographic range in eastern North America. Smolt information will provide information on river-specific variability in freshwater feeding strategies. Intermediate marine life-history stages will be investigated from samples obtained at West Greenland as non-maturing one-sea-winter salmon, coupled with the proposed marine research survey intended to target the early post-smolt phase.

### **Study design**

Variability in the trophic ecology of Atlantic will be examined from analyses of stable isotope signatures of carbon and nitrogen ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) with comparisons among populations at the freshwater-smolt stage, as well as between life-history stages from post-smolts caught at sea, non-maturing 1SW salmon feeding at West Greenland, and with adults that return to respective rivers in the following year.

We propose to analyze isotope signatures from muscle, liver, scales and adipose fin tissue. In situations where lethal sampling of salmon is not an option (e.g., catch-and-release angling fisheries, populations at low abundance), scales and adipose fins provide non-lethal alternatives. As noted earlier, this approach will yield information on ontogenetic differences in isotope signatures across life-history stages (smolt, post-smolt, adult) across a broad geographic area.

Samples from West Greenland and from the proposed research cruise will be obtained on an opportunistic basis with a target of approximately 150 specimens from each but with potentially more samples from the marine research cruise should they be available; this, however, would increase the estimated costs of analysis. The potential river sampling locations and the respective tissues identified for stable isotope analyses are identified in Table 1.

To complement salmon trophic information, isotope analyses will also be carried out on a subset of other species that may be captured in the pelagic trawl, or obtained from stomach contents of salmon at sea. These data will provide insight into key dietary items of the food web structure within which salmon operate. Thus, five replicate samples of each of the key prey types within the size range consumed would be desirable.

**Table 1.** Location, life stage and tissues to be sampled from Atlantic salmon to examine trophic ecology.

| SFA/<br>Zone | River            | Tributary   | From Smolts                   |       |     |        | Returning adults |        |            |        |
|--------------|------------------|-------------|-------------------------------|-------|-----|--------|------------------|--------|------------|--------|
|              |                  |             | Muscle                        | Liver | Fin | Scales | 1SW salmon       |        | 2SW salmon |        |
|              |                  |             |                               |       |     |        | Fin              | Scales | Fin        | Scales |
| 23           | Nashwaak         |             | X                             | X     | X   | X      | X                | X      | X          | X      |
| 21           | LaHave           |             | X                             | X     | X   | X      | X                | X      | X          | X      |
| 18           | Margaree         |             | X                             | X     | X   | X      | X                | X      | X          | X      |
| 16           | Miramichi        | Southwest   | X                             | X     | X   | X      | X                | X      | X          | X      |
|              |                  | Northwest   | X                             | X     | X   | X      | X                | X      | X          | X      |
| 15           | Restigouche      | Kedgwick    | X                             | X     | X   | X      | X                | X      | X          | X      |
|              |                  | Upsalquitch | X                             | X     | X   | X      | X                | X      |            |        |
| Q2           | St-Jean          |             | X                             | X     | X   | X      | X                | X      | X          | X      |
| Q7           | De la<br>Trinite |             | X                             | X     | X   | X      | X                | X      | X          | X      |
| 11           | Conne            |             | X                             | X     | X   | X      | X                | X      |            |        |
| 9            | Rocky            |             | X                             | X     | X   | X      | X                | X      |            |        |
| 4            | Campbellton      |             | X                             | X     | X   | X      | X                | X      |            |        |
| 4            | Exploits         |             | X                             | X     | X   | X      | X                | X      |            |        |
| 14A          | Western<br>Arm   |             | X                             | X     | X   | X      | X                | X      |            |        |
| 2            | Sand Hill        |             | X                             | X     | X   | X      | X                | X      | X          | X      |
|              |                  |             | Post-smolt and West Greenland |       |     |        |                  |        |            |        |
|              | Post-smolt       |             | X                             | X     | X   | X      |                  |        |            |        |
|              | West Greenland   |             | X                             | X     | X   | X      |                  |        |            |        |

Samples will be collected over three years with the objective of tracking changes in trophic ecology of salmon through the marine phase (Table 2). In addition, annual variation in trophic state among 1SW maturing, 1SW non-maturing and 2SW salmon will be examined by sampling these stages even if some of the data on smolts or early post-smolt stages are not available. The samples from West Greenland will also provide inter-continental comparisons of trophic ecology for that life stage.

**Table 2.** Schedule of samples to be collected by life stage.

|                          | 2008 |      |      |        |           | 2009 |      |      |        |           | 2010 |      |      |        |           |
|--------------------------|------|------|------|--------|-----------|------|------|------|--------|-----------|------|------|------|--------|-----------|
|                          | May  | June | July | August | September | May  | June | July | August | September | May  | June | July | August | September |
| Smolt                    | X    | X    |      |        |           | X    | X    |      |        |           |      |      |      |        |           |
| Post-smolt               |      |      |      | X      |           |      |      |      | X      |           |      |      |      |        |           |
| Marine prey (post-smolt) |      |      |      | X      |           |      |      |      | X      |           |      |      |      |        |           |
| 1SW salmon               |      |      |      |        |           |      | X    | X    |        |           |      | X    | X    |        |           |
| 1SW non-maturing (WG)    |      |      |      | X      | X         |      |      |      | X      | X         |      |      |      | X      | X         |
| Marine prey (WG)         |      |      |      | X      | X         |      |      |      | X      | X         |      |      |      | X      | X         |
| 2SW salmon               |      |      |      |        |           |      | X    | X    |        |           |      | X    | X    |        |           |

### Estimated cost of analysis over the next three years (2008 to 2010)

As the number of life stages sampled varies with the year, the cost of analysis also varies. Stable isotope analysis for C and N costs \$10 per tissue sample. For 2008, the proposed cost of analysis is \$39,000 (Cdn).

| Life stage                           | Number of locations         | Tissues                        | Number of samples per tissue | Total           |
|--------------------------------------|-----------------------------|--------------------------------|------------------------------|-----------------|
| Smolt                                | 15 index rivers             | Muscle, liver, scales, adipose | 30                           | \$18,000        |
| Post-smolt                           | Labrador Sea                | Muscle, liver, scales, adipose | 150                          | \$6,000         |
| Marine prey                          | Labrador Sea, Two locations | 20 prey item types             | 5                            | \$2,000         |
| 1SW non-maturing (WG)                | West Greenland              | Muscle, liver, scales, adipose | 150                          | \$6,000         |
| Marine prey                          | West Greenland              | 20 prey item types             | 5                            | \$2,000         |
| Labour for laboratory preparations   |                             |                                |                              | \$5,000         |
| <b>Funding for analysis for 2008</b> |                             |                                |                              | <b>\$39,000</b> |

|                                      |                             |                                |     |                 |
|--------------------------------------|-----------------------------|--------------------------------|-----|-----------------|
| Smolt                                | 15 index rivers             | Muscle, liver, scales, adipose | 30  | \$18,000        |
| Post-smolt                           | Labrador Sea                | Muscle, liver, scales, adipose | 150 | \$6,000         |
| Marine prey                          | Labrador Sea, Two locations | 20 prey item types             | 5   | \$2,000         |
| 1SW salmon                           | 15 index rivers             | Scales, adipose                | 30  | \$9,000         |
| 1SW non-maturing (WG)                | West Greenland              | Muscle, liver, scales, adipose | 150 | \$6,000         |
| Marine prey                          | West Greenland              | 20 prey item types             | 5   | \$2,000         |
| 2SW salmon                           | 9 index rivers              | Scales, adipose                | 30  | \$5,400         |
| Labour for laboratory preparations   |                             |                                |     | \$7,500         |
| <b>Funding for analysis for 2009</b> |                             |                                |     | <b>\$55,900</b> |

|                                      |                 |                                |     |                 |
|--------------------------------------|-----------------|--------------------------------|-----|-----------------|
| 1SW salmon                           | 15 index rivers | Scales, adipose                | 30  | \$9,000         |
| 1SW non-maturing (WG)                | West Greenland  | Muscle, liver, scales, adipose | 150 | \$6,000         |
| Marine prey                          | West Greenland  | 20 prey item types             | 5   | \$2,000         |
| 2SW salmon                           | 9 index rivers  | Scales, adipose                | 30  | \$5,400         |
| Labour for laboratory preparations   |                 |                                |     | \$4,000         |
| <b>Funding for analysis for 2010</b> |                 |                                |     | <b>\$26,400</b> |

## **Timelines for the tissue collections and analysis**

### For 2008

The tissue collections from smolts from the index rivers began in May 2008 and will be completed by the end of June 2008. The post-smolt survey for the Labrador Sea is anticipated for August 2008 with tissue collection occurring on the vessel. The West Greenland samples would be collected in August and September and be available for analysis by the end of October 2008.

All the laboratory analyses would be conducted between September 2008 to February 2009 with preliminary analyses and interpretation available for the ICES Working Group meeting in April 2009 and the NASCO meeting of June 2009.

Timelines for other years would follow a similar schedule.

## **Coordination, data analysis and interpretation**

Tissue collection from the index rivers and for post-smolts is being coordinated by Gerald Chaput (DFO Gulf Region).

Tissue collection and prey items from West Greenland are coordinated by Dr. Tim Sheehan (NMFS, NOAA, US).

Isotope analyses will be coordinated by Dr. Michael Power and conducted at the Environmental Isotope Laboratory, University of Waterloo (Canada).

Data analysis and interpretation will be lead by Brian Dempson (DFO NL, Canada) and Dr. Michael Power (U. of Waterloo, Canada).

**Proposal submitted to the International Atlantic Salmon Research Board relative to  
furthering the knowledge on marine ecology of Atlantic salmon.**

**June 2008**

**By**

**Gérald Chaput, Tim Sheehan, and Brian Dempson  
SALSEA North America**

**Inferring temperature history of Atlantic salmon at sea  
based on oxygen isotope ratios in otoliths**

In addition to tissue samples to evaluate the trophic ecology of salmon, we propose to analyze oxygen isotopes that are deposited in otoliths. Because oxygen isotopes are deposited in equilibrium with the environmental waters in which the fish live, they can provide a temperature history experienced by the fish. Measurement of thermal habitat use relies on temperature dependent fractionation of  $\delta^{18}$  oxygen isotopes during the formation of otoliths and established otolith  $\delta^{18}$  oxygen–temperature relationships for conversion between the two. Ideally, insight into the thermal habitat use of salmon across various life-history stages from analyses of oxygen isotopes will be coupled with ecological information on smolt size and age and corresponding food web data as inferred from carbon and nitrogen signatures. Collectively, these analyses may shed additional insight into respective productivity differences among stocks throughout much of the natural distribution of salmon in the North West Atlantic Ocean ranging from Nova Scotia, New Brunswick, Quebec, Newfoundland and possibly southern Labrador.

This proposal complements the stable isotope research and uses the same material sources as for the stable isotope project. As such, the costing of this proposal is for analysis purposes only. A water sample is to be collected at every location where fish are collected.

| SFA/Zone | River          | Tributary   | Smolts                        | 1SW | 2SW | Water sample |
|----------|----------------|-------------|-------------------------------|-----|-----|--------------|
| 23       | Nashwaak       |             | X                             |     |     | X            |
| 21       | LaHave         |             | X                             |     |     | X            |
| 18       | Margaree       |             | X                             |     |     | X            |
| 16       | Miramichi      | Southwest   | X                             | X   | X   | X            |
|          |                | Northwest   | X                             | X   | X   | X            |
| 15       | Restigouche    | Kedgwick    | X                             | X   |     | X            |
|          |                | Upsalquitch | X                             | X   |     | X            |
| Q2       | St-Jean        |             | X                             | X   |     | X            |
| Q7       | De la Trinite  |             | X                             | X   |     | X            |
| 11       | Conne          |             | X                             | X   |     | X            |
| 9        | Rocky          |             | X                             | X   |     | X            |
| 4        | Campbellton    |             | X                             | X   |     | X            |
| 4        | Exploits       |             | X                             | X   |     | X            |
| 14A      | Western Arm    |             | X                             | X   |     | X            |
| 2        | Sand Hill      |             | X                             | X   |     | X            |
|          |                |             | Post-smolt and West Greenland |     |     |              |
|          | Post-smolt     |             | X                             |     |     | X            |
|          | West Greenland |             | X                             |     |     | X            |



**Table 2.** Schedule of samples to be collected by life stage.

|                       | 2008 |      |      |        |           | 2009 |      |      |        |           | 2010 |      |      |        |           |
|-----------------------|------|------|------|--------|-----------|------|------|------|--------|-----------|------|------|------|--------|-----------|
|                       | May  | June | July | August | September | May  | June | July | August | September | May  | June | July | August | September |
| Smolt                 | X    | X    |      |        |           | X    | X    |      |        |           |      |      |      |        |           |
| Post-smolt            |      |      |      | X      |           |      |      |      | X      |           |      |      |      |        |           |
| 1SW salmon            |      |      |      |        |           |      | X    | X    |        |           |      | X    | X    |        |           |
| 1SW non-maturing (WG) |      |      |      | X      | X         |      |      |      | X      | X         |      |      |      | X      | X         |
| 2SW salmon            |      |      |      |        |           |      | X    | X    |        |           |      | X    | X    |        |           |
| Water sample          | X    | X    |      | X      | X         | X    | X    | X    | X      | X         |      |      |      | X      | X         |

### Estimated cost of analysis over the next three years (2008 to 2010)

As the number of life stages sampled varies with the year, the cost of analysis also varies. Otolith analysis of oxygen isotopes costs \$20 (Cdn) per sample. For 2008, the proposed cost of analysis is \$17,900 (Cdn).

| Life stage                           | Number of locations                              | Tissues  | Number of samples per tissue | Total           |
|--------------------------------------|--|----------|------------------------------|-----------------|
| Smolt                                | 15 index rivers                                  | Otoliths | 30                           | \$9,000         |
| Post-smolt                           | Labrador Sea                                     | Otoliths | 150                          | \$3,000         |
| 1SW non-maturing (WG)                | West Greenland                                   | Otoliths | 150                          | \$3,000         |
| Water samples                        | 20 locations (15 rivers + 3 Labrador Sea + 2 WG) | Water    | 1                            | \$400           |
| Labour for laboratory preparations   |  |          |                              | \$2,500         |
| <b>Funding for analysis for 2008</b> |  |          |                              | <b>\$17,900</b> |

|                                      |  |          |     |                 |
|--------------------------------------|--|----------|-----|-----------------|
| Smolt                                | 15 index rivers                                  | Otoliths | 30  | \$9,000         |
| Post-smolt                           | Labrador Sea                                     | Otoliths | 150 | \$3,000         |
| 1SW salmon                           | 12 index rivers                                  | Otoliths | 30  | \$7,200         |
| 1SW non-maturing (WG)                | West Greenland                                   | Otoliths | 150 | \$3,000         |
| 2SW maturing                         | Miramichi River (2 sites)                        | Otoliths | 30  | \$1,200         |
| Water samples                        | 20 locations (15 rivers + 3 Labrador Sea + 2 WG) | Water    | 1   | \$400           |
| Labour for laboratory preparations   |  |          |     | \$5,000         |
| <b>Funding for analysis for 2009</b> |  |          |     | <b>\$28,800</b> |

|                                      |                           |          |     |                 |
|--------------------------------------|---------------------------|----------|-----|-----------------|
| 1SW salmon                           | 15 index rivers           | Otoliths | 30  | \$9,000         |
| 1SW non-maturing (WG)                | West Greenland            | Otoliths | 150 | \$3,000         |
| 2SW salmon                           | Miramichi River (2 sites) | Otoliths | 30  | \$1,200         |
| Water samples                        | 2 locations (WG)          | Water    |     | \$40            |
| Labour for laboratory preparations   |                           |          |     | \$2,000         |
| <b>Funding for analysis for 2010</b> |                           |          |     | <b>\$15,240</b> |

### **Timelines for the tissue collections and analysis**

#### For 2008

The otolith collections from smolts from the index rivers began in May 2008 and will be completed by the end of June 2008. The post-smolt survey for the Labrador Sea is anticipated for August 2008 with tissue collection occurring on the vessel. The West Greenland samples would be collected in August and September and be available for analysis by the end of October 2008. The otoliths will be extracted from the same fish sampled for tissues for C and N stable isotopes.

All the laboratory analyses would be conducted between September 2008 to February 2009 with preliminary analyses and interpretation available for the ICES Working Group meeting in April 2009 and the NASCO meeting of June 2009.

Timelines for other years would follow a similar schedule.

### **Coordination, data analysis and interpretation**

Tissue and otolith collections from the index rivers and for post-smolts is being coordinated by Gerald Chaput (DFO Gulf Region).

Otolith collections from West Greenland are coordinated by Dr. Tim Sheehan (NMFS, NOAA, US).

Isotope analyses will be coordinated by Dr. Michael Power and conducted at the Environmental Isotope Laboratory, University of Waterloo (Canada).

Data analysis and interpretation will be lead by Brian Dempson (DFO NL, Canada) and Dr. Michael Power (U. of Waterloo, Canada).

## **FUNDING PROPOSAL TO IASRB**

### **Participation of additional experts at ICES Study Group on Biological Characteristics of Salmon**

**Funding sought:** Up to £5,000

#### **Rationale:**

In the request for scientific advice in 2007, NASCO asked ICES to examine and report on associations between changes in biological characteristics of all life stages of Atlantic salmon, environmental changes and variations in marine survival with a view to identifying predictors of abundance. Such information may provide valuable insights into the factors affecting the changes in marine mortality of salmon and therefore support the SALSEA programme. Work was initiated by the North Atlantic Salmon Working Group in 2008, and ICES has recommended that efforts be continued to identify and collate further information on biological characteristics of salmon from river populations and fisheries throughout the North Atlantic. It has therefore proposed that an ICES Study Group be established to facilitate a unified effort to further develop and investigate the datasets for changes in biological characteristics and stock performance. A proposal will be submitted to the ICES Diadromous Fish Committee in September for a Study Group to meet in the next year.

The IASRB SAG has noted the need for greater co-ordination of research activities related to the SALSEA programme, in relation to both the marine and freshwater factors affecting the survival of salmon at sea. The SAG has further noted that there are scientists working in relevant research areas who may not easily be able to attend the proposed ICES Study Group, for example from universities, because of lack of funding.

Funding is therefore sought from the IASRB to pay for up to two additional scientists to participate in this Study Group at the invitation of the Study Group Chair. The total cost will not exceed £5,000.

**CNL(08)9*****Request for Scientific Advice from ICES*****1. With respect to Atlantic salmon in the North Atlantic area:**

- 1.1 provide an overview of salmon catches and landings, including unreported catches by country and catch and release, and production of farmed and ranched Atlantic salmon in 2008<sup>1</sup>;
- 1.2 report on significant new or emerging threats to, or opportunities for, salmon conservation and management<sup>2</sup>;
- 1.3 continue the work already initiated to investigate associations between changes in biological characteristics of all life stages of Atlantic salmon, environmental changes and variations in marine survival with a view to identifying predictors of abundance<sup>3</sup>;
- 1.4 provide a compilation of tag releases by country in 2008 and advise on progress with analysing historical tag recovery data from oceanic areas;
- 1.5 evaluate the results of studies that estimate the level of pre-spawning mortality of salmon caught and released by anglers and the implications for stock assessments;
- 1.6 identify relevant data deficiencies, monitoring needs and research requirements<sup>4</sup>.

**2. With respect to Atlantic salmon in the North-East Atlantic Commission area:**

- 2.1 describe the key events of the 2008 fisheries<sup>5</sup>;
- 2.2 provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;
- 2.3 review and report on the development of age-specific stock conservation limits;
- 2.4 describe the status of the stocks and provide annual catch options or alternative management advice for 2010-2012, if possible based on forecasts of PFA for northern and southern stocks, with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding<sup>6</sup>;
- 2.5 further develop methods to forecast PFA for northern and southern stocks with measures of uncertainty;
- 2.6 further investigate opportunities to develop a framework of indicators that could be used to identify any significant change in previously provided multi-annual management advice.

**3. With respect to Atlantic salmon in the North American Commission area:**

- 3.1 describe the key events of the 2008 fisheries (including the fishery at St Pierre and Miquelon)<sup>5</sup>;
- 3.2 provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;
- 3.3 update age-specific stock conservation limits based on new information as available;

- 3.4 describe the status of the stocks and provide annual catch options or alternative management advice for 2009-2012 with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding<sup>6</sup>;
4. **With respect to Atlantic salmon in the West Greenland Commission area:**
  - 4.1 describe the key events of the 2008 fisheries<sup>5</sup>;
  - 4.2 provide any new information on the extent to which the objectives of any significant management measures introduced in recent years have been achieved;
  - 4.3 describe the status of stocks and provide annual catch options or alternative management advice for 2009-2011 with an assessment of risk relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding<sup>6,7</sup>;
  - 4.4 update the framework of indicators used to identify any significant change in the previously provided multi-annual management advice.

**Notes:**

1. *With regard to question 1.1, ICES is asked to ensure that the terminology used in presenting the data on ranching is clearly defined. For the estimates of unreported catch the information provided should, where possible, indicate the location of the unreported catch in the following categories: in-river; estuarine; and coastal.*
2. *With regard to question 1.2, ICES is requested to include information on any new research into the migration and distribution of salmon at sea.*
3. *With regard to question 1.3, there is interest in determining if declines in marine survival coincide with changes in the biological characteristics of juveniles in fresh water or are modifying characteristics of adult fish (size at age, age at maturity, condition, sex ratio, growth rates, etc.) and with environmental changes.*
4. *NASCO's International Atlantic Salmon Research Board's inventory of on-going research relating to salmon mortality in the sea will be provided to ICES to assist it in this task.*
5. *In the responses to questions 2.1, 3.1 and 4.1 ICES is asked to provide details of catch, gear, effort, composition and origin of the catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Any new information on non-catch fishing mortality, of the salmon gear used, and on the by-catch of other species in salmon gear, and on the by-catch of salmon in any existing and new fisheries for other species is also requested.*
6. *In response to questions 2.4, 3.4 and 4.3 provide a detailed explanation and critical examination of any changes to the models used to provide catch advice.*
7. *In response to question 4.3, ICES is requested to provide a brief summary of the status of North American and North-East Atlantic salmon stocks. The detailed information on the status of these stocks should be provided in response to questions 2.4 and 3.4.*

**Council**

**CNL(08)10**

***Report of the Ad Hoc Review Group on Implementation Plans***

## **Report of the *Ad Hoc* Review Group on Implementation Plans**

1. The Strategic Approach for NASCO's 'Next Steps' requires that each Party or jurisdiction develop an Implementation Plan focused around NASCO's three main agreements (which address fishery management, habitat protection and restoration, and aquaculture and associated activities) and which also take into account NASCO's various guidelines. Draft Implementation Plans were presented at a Special Session at the Twenty-Third Annual Meeting in 2006 and were then submitted for review by an *Ad Hoc* Review Group comprising Mary Colligan, Ted Potter, Andras Kristiansen and Arni Isaksson for NASCO's Parties and Chris Poupard and Gareth Porter for the NGOs. I served as the Coordinator and the Secretariat facilitated the Group's work and provided the rapporteur. The Group's first report with its initial assessment of the plans was presented at the Twenty-Fourth Annual Meeting. The focus of the review was the structure of the plans and their conformity to the guidelines; it was not about the adequacy or otherwise of each jurisdiction's record of salmon management.
2. Last year the Council concluded that the review process had been a very valuable process and in the light of the *Ad Hoc* Review Group's assessments decided that the plans should be submitted in final form for further review by the Group. The Group, therefore, met in London during 11-14 December 2007 and reviewed a total of sixteen plans, two of which had not previously been reviewed. Following this review, consistent with its Terms of Reference, the Group asked that the President write to jurisdictions providing specific comments and inviting them to make any further amendments to their plans by 11 February 2008. These revised plans were then reviewed by correspondence, and the group's final assessments of all sixteen plans are contained in Section 5 of its report which is attached.
3. A report on the Group's findings will be presented during a Special Session at the Twenty-Fifth Annual Meeting. While most of the Plans are now considered to be satisfactory and form a sound basis for future reporting, for some plans there are still shortcomings that the group proposes be addressed through the Focus Area Reports and/or Annual Progress reports.
4. The Group welcomes the progress that has been made. In particular, the contributions are very welcome from those jurisdictions that had in the past made limited information available to NASCO on the resource, the threats to it and the management regimes to address these. The Group stresses the importance of developing, refining and improving the Implementation Plans which, although applying for a period of five years without major change, may be subject to changes which would be reported to the Council in the annual progress reports. This should not be seen as a bureaucratic chore but an essential part of the 'Next Steps' process. The Group urges those jurisdictions that have not yet submitted plans to do so at the earliest opportunity.

5. The Council is asked to consider the report of the first *Ad Hoc* Review Group, which has now completed its work, and decide on appropriate action. The Council will also be asked to decide on the second focus area for the reports by the Parties due in 2009 and agree Terms of Reference and composition for an *Ad Hoc* Group to review these reports.

Secretary  
Edinburgh  
9 April 2008



***Report of the Second Meeting of the  
Ad Hoc Review Group on Implementation Plans***

***NEAFC Headquarters, London  
11 - 14 December, 2007***

**1. Opening of the Meeting by the Coordinator**

- 1.1 The Coordinator, Dr Malcolm Windsor, opened the meeting and welcomed members of the *Ad Hoc* Review Group to London. He referred to the progress made by the Group at its first meeting in March 2007, at which it had agreed its working methods and had undertaken initial reviews of fifteen Implementation Plans. The Group's report had been presented at NASCO's Twenty-Fourth Annual Meeting and the Council had concluded that the review process to date had been very valuable. He thanked the members of the Group for their excellent work in undertaking the initial reviews and in presenting the findings in a critical, but fair, manner. He noted that in the light of the Group's findings the Council had agreed that all jurisdictions be requested to provide their final plans to the Secretariat by 1 November 2007 so that these could be reviewed or re-reviewed by the Group. The challenge for the Group now would be to re-review plans that had been re-submitted to ensure that the changes requested by the Group had been made and to conduct a review of new plans using the format and procedures agreed at the first meeting. Under the Group's Terms of Reference (see Section 3) if the Group continued to have concerns about any Implementation Plan the President could be asked to liaise with the Party concerned.
- 1.2 A list of participants is contained in Annex 1. Mr Andras Kristiansen (Denmark (in respect of the Faroe Islands and Greenland)) and Dr Gareth Porter (NGOs) were unable to participate in the Group's second meeting but had contributed to its work.

**2. Adoption of the Agenda**

- 2.1 The *Ad Hoc* Review Group adopted an agenda for its second meeting, IP(07)27 (Annex 1).

**3. Review of Terms of Reference and Consideration of Working Methods**

- 3.1 The original Terms of Reference for the Group, agreed by Heads of Delegations in 2007, are contained in Annex 2.
- 3.2 The Council had subsequently revised these Terms of Reference by asking that final plans be submitted by 1 November 2007 and that the *Ad Hoc* Review Group report on its assessment of these plans by 1 March 2008.
- 3.3 The Group discussed its working methods and agreed that in the case of new plans (see 4.1 below) it would first conduct a detailed review using the review format and

the approach agreed at its first meeting in order to assess consistency of these plans with the guidelines, NSTF(06)10. Those plans that had been reviewed at the Group's first meeting would be re-reviewed to assess if the elements in these plans previously identified as unsatisfactory had been improved. The Group agreed that it would not, however, present its findings using the review form. It was likely to be more helpful to identify those plans it considered to be satisfactory as a basis for future reporting and provide specific comments on those plans that the Group felt would benefit from further improvement.

- 3.4 Consistent with its Terms of Reference the Group agreed that, where necessary, it would ask that the President write to jurisdictions providing specific comments and inviting them to make any further amendments to their plans by 11 February 2008. Thereafter the Group would finalise its report including its assessments of the plans, which would be issued to all delegates as a Council paper. In the event that further revisions were made by any jurisdiction by 11 February, the Group would work by correspondence to assess the changes made and to finalise its assessment. Where a jurisdiction did not respond by this deadline the Group's assessment developed at its second meeting would be included in its report.
- 3.5 The Group recommends that the final plans be allocated Council paper numbers, collated by the Secretariat and issued to all delegates before the next Annual Meeting of NASCO.

#### **4. Review of New and Revised Implementation Plans**

- 4.1 The Group emphasised the importance of developing, refining and improving Implementation Plans which, although applying for a period of five years without major change, may be subject to changes which would be reported to the Council in the annual progress reports. This should not be considered as a bureaucratic chore, but an essential part of the 'Next Steps' process. Implementation Plans will provide a measure of how jurisdictions are progressing in implementing NASCO's resolutions and agreements over the next five years and consequently in achieving NASCO's objectives of conserving and restoring Atlantic salmon. Unless the Implementation Plans are satisfactory, with an action plan of measurable outputs and timescales, the next stage of the process, in which focus area reports are submitted for individual agreements, will be compromised. The Group is encouraged by the overall progress that has been made since the initial assessments and by the fact that plans are now available for most jurisdictions. The Group believes that the process of developing Implementation Plans will stimulate further progress in developing management approaches consistent with NASCO's agreements and in some cases is likely to lead to improved coordination within jurisdictions. The process should also stimulate an exchange of information on best practice among NASCO's Parties.
- 4.2 In developing its assessments, the Group has striven to be fair. The Group recognised that the range of jurisdictions in NASCO has different legal structures, management methods, languages, resources and culture and that they will approach salmon conservation in somewhat different ways. Nevertheless, the same principles as outlined in the NASCO resolutions and agreements should apply and the Implementation Plans should all be able to detail specific management actions with

timescales for their implementation. While most jurisdictions have made considerable improvements to their plans, in the interests of fairness the Group felt that it had a duty to highlight shortcomings in some plans, particularly the lack of specific management actions with timescales. In this regard, the Group stressed that an action specifies what will be done in a given period of time rather than identifying general goals. For example, the goal may be to reduce illegal fishing but the actions that could be used to achieve that goal might be to increase enforcement effort, introduce carcase tagging, etc., within a specified period of time. The Group developed definitions of terms (including actions, measurable outputs, deliverables) that might assist the Parties in revising their plans and in reporting on them, IP(07)25 (Annex 3).

4.3 The Group reviewed a total of sixteen Implementation Plans. Two of these plans (EU (France) and EU (Germany)) had not previously been reviewed by the Group, which greatly welcomed these contributions. In the past, limited information has been provided to NASCO by these jurisdictions so the details of the resource and threats to it, the current management regimes in place and the future commitments to implement measures consistent with NASCO's resolutions and agreements are very welcome. An Implementation Plan for the Faroe Islands had been reviewed at the Group's first meeting but it referred only to the situation in four small rivers in which salmon populations have been established. The revised plan now includes details of the offshore marine fishery although this has not been conducted for some years. These three new plans were therefore reviewed using the approach and review format developed at the Group's first meeting to assess consistency with the guidelines, NSTF(06)10. The new and revised Implementation Plans reviewed by the Group were for the following jurisdictions:

- Canada;
- Denmark (in respect of the Faroe Islands);
- Denmark (in respect of Greenland);
- EU - Denmark;
- EU - Finland;
- EU - France;
- EU - Germany
- EU - Ireland;
- EU - Sweden;
- EU - UK (England and Wales);
- EU - UK (Northern Ireland);
- EU - UK (Scotland);
- Iceland;
- Norway;
- Russian Federation;
- USA

4.4 At its first meeting the Group had recognised that the extent of the salmon stocks and the resources available to manage them vary markedly among jurisdictions. While the Group took no account of these differences in undertaking its reviews, it did accept that the Implementation Plans for jurisdictions with a small number of salmon stocks might be relatively brief, although they should still contain the core elements

identified in the guidelines and specify management actions with timescales for their implementation. Furthermore, while it would not be reasonable to expect management actions to be implemented to address every threat to the resource within the next five years, the Group felt that all the plans should contain a reasonable number of specific actions, clearly numbered to allow referencing when reporting on progress, with clear timescales for their implementation.

- 4.5 The Group considered that some plans still contain aspirational elements rather than specific actions. The Group recognises that the extent to which management actions specified in the plans can be implemented within the five year period of the plan will depend on the availability of adequate resources at the time of their implementation. The availability of these resources may not have been guaranteed when the plan was developed. The objective of the Implementation Plans is to demonstrate how NASCO's Agreements, Resolutions and Guidelines are being implemented, but the Group noted that many plans make limited reference to NASCO or to any of these commitments. Furthermore many plans provided only limited linkages between actions and specific aspects of the Agreements. The Group noted that these issues will need to be followed up in more detail in the appropriate Focus Area Reports.
- 4.6 The Review Group also identified the following formatting and content elements that greatly assisted in the clarity and understanding of Plans and which might be taken into account in subsequent revisions to the Plans:
- Maps: A map illustrating the major salmon rivers within a Party or jurisdiction provided some orientation and greater context to the descriptions within the text.
  - Numbering of Actions: Unique numbering for each planned action made the actions more obvious within the Plan and will greatly facilitate further reporting against these actions.

## **5. Development of Recommendations on Adequacy of Implementation Plans**

### ***Jurisdictions Submitting Plans***

- 5.1 The Group's final recommendations on each of the sixteen plans it reviewed are listed below. These final recommendations were developed by correspondence after the Group's second meeting. In accordance with its Terms of Reference, the Group had reviewed three new plans and re-reviewed thirteen plans at its second meeting. Its assessments of these plans were made available to the President who liaised, where appropriate, with the jurisdictions concerned and asked that any further revisions proposed by the *Ad Hoc* Review Group be sent back to the Secretariat by 11 February. Although some revised plans were not submitted by this deadline, all have been re-examined by the Group. The final review was conducted by the Group by correspondence and the assessments below are of the final plans submitted following the President's communication. The final plans will be compiled by the Secretariat and issued to all delegates prior to the Twenty-Fifth Annual Meeting.

### **Canada - IP(07)17 FINAL**

This plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **Denmark (in respect of the Faroe Islands) - IP(07)22 FINAL**

This plan shows considerable improvement following the initial assessment by the Review Group and is now considered to be satisfactory in most areas. However, in relation to the areas of fishery management and management of aquaculture, introductions and transfers the Plan says only that relevant NASCO agreements will be applied and does not provide any actions stating what will actually be done or when. This will make it difficult to determine whether satisfactory progress is being achieved. These issues will need to be addressed in more detail in the appropriate Focus Area Reports.

### **Denmark (in respect of Greenland) - IP(07)18 FINAL**

This plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory. However, additional details on the management of the fishery should be provided in the Focus Area Report on Fishery Management.

### **EU – Denmark – IP(07)12 FINAL**

This plan shows some improvement following the initial assessment by the Review Group but it is suggested that the following points be addressed in future Focus Area Reports and Annual Progress Reports:

1. The objective of the Implementation Plan is to demonstrate how NASCO's Agreements, Resolutions and Guidelines are being implemented, but the plan makes no reference to NASCO or any of these commitments. It should, therefore, refer to these commitments in the context of fisheries management, habitat protection and restoration, and aquaculture, introductions and transfers.
2. A clear indication of expected outputs and delivery dates should be provided for each intended management action
3. There should be a summary of monitoring and evaluation activities.

### **EU - Finland - IP(07)13 FINAL**

This plan shows some improvement following the initial assessment by the Review Group but it is suggested that the following points be addressed in future Focus Area Reports and Annual Progress Reports:

1. The Plan is complicated by the fact that all rivers lie on borders with other NASCO Parties. There is therefore a need to clarify which agencies are responsible for addressing the various management challenges that arise.

2. The objective of the Implementation Plan is to demonstrate how the NASCO Agreements, Resolutions and Guidelines will be implemented. There is therefore a need to explain how this will be addressed over the coming five year period.
3. The Plan should describe specific actions that will be undertaken, both cooperatively and within Finland, to address the threats relating to fisheries management, habitat protection and restoration and aquaculture introductions and transfers. The Review Group noted that Finland felt unable to specify actions at this stage but recommends that Finland provides appropriate updates to their Implementation Plan, including a clear list of actions (with expected outputs and delivery dates) in their Annual Progress Reports for 2008 and 2009.

#### **EU - France - IP(07)20 FINAL**

This new Plan is considered to be satisfactory.

#### **EU - Germany - IP(07)21 FINAL**

This new Plan is considered to be satisfactory. However, the status of stocks is described in a general way that will make future comparison difficult. It is suggested that more detail be provided in future Focus Area Reports.

#### **EU - Ireland - IP(07)23 FINAL**

This Plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory. However, the Group notes that parts of the Plan, including the summary table of fishery management actions, are still labeled draft. It will be important that the status of the Plan is confirmed in the 2008 Progress Report.

#### **EU - Sweden - IP(07)14 FINAL**

This Plan shows considerable improvement following the initial assessment by the Review Group and is now largely satisfactory, but it is suggested that the following points be addressed in future Focus Area Reports and Annual Progress Reports:

1. The objective of the Implementation Plan is to demonstrate how NASCO's Agreements, Resolutions and Guidelines are being implemented, but the plan makes no reference to NASCO or any of these commitments. It should, therefore, refer to these commitments in the context of fisheries management, habitat protection and restoration, and aquaculture, introductions and transfers.
2. The Plan describes a number of threats relating to aquaculture, introductions and transfers, but it is not clear what actions will be taken to address these, and when they will be completed. This will make it difficult to determine whether satisfactory progress is being achieved.

### **EU - UK (England and Wales) - IP(07)10 FINAL**

Further refinements have been made to this plan following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **EU - UK (Northern Ireland) - IP(07)11 FINAL**

This Plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **EU-UK (Scotland) - IP(07)19 FINAL**

This Plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **Iceland - IP(07)8 FINAL**

This plan shows considerable improvement following the initial assessment by the Review Group; the plan is now considered to be satisfactory in most areas. However, while the Review Group recognises the success of existing salmon management in Iceland, the Plan still makes little reference to the various NASCO agreements that it should be designed to address, and while it includes over thirty actions most of these do not state clearly what will be done or when. These issues will need to be addressed in more detail during the appropriate Focus Area Reports.

### **Norway - IP(07)9 FINAL**

Further refinements have been made to this plan following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **Russia - IP(07)15 FINAL**

This plan shows considerable improvement following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### **USA - IP(07)16 FINAL**

Further refinements have been made to this plan following the initial assessment by the Review Group; the plan is considered to be satisfactory.

### ***Jurisdictions not Submitting Plans***

- 5.3 The Group noted, with concern, the lack of Implementation Plans for EU (Portugal) and EU (Spain). In the case of Portugal, the Group is aware that representatives from the Portuguese authorities rarely attend NASCO meetings although they do receive mailings on NASCO matters. Furthermore, the Group recognises that the Atlantic salmon may occur in very few rivers in Portugal and the status in those rivers is uncertain. Nevertheless, salmon are known to occur in the River Minho, which is a border river with Spain.

- 5.4 In the case of Spain, the Group had reviewed a plan for Asturias at its first meeting and had hoped that a more comprehensive plan covering all the autonomous regions with salmon interests (Asturias, Cantabria, Galicia, Navarra, and the Basque Country) would be made available for review. The Group is aware that these regions do have management programmes in place for Atlantic salmon and that the resource is highly prized in these communities. Following the Group's meeting, a letter was received from the Ministry of Agriculture, Fisheries and Food in Madrid concerning future development of an Implementation Plan for Spain. This letter, and the response from the Secretary of NASCO, are contained in Annex 4.
- 5.5 The Group does not take the view that because the stocks of salmon in Spain and Portugal are relatively small, it is acceptable to omit them from the Implementation Plan process. It could be argued that the challenges facing the conservation and management of salmon populations at the southern end of the range of the species in Europe are particularly great and that they represent an important component of genetic diversity. The Group therefore asks that the Council requests, through the European Commission, that the authorities in these jurisdictions develop Implementation Plans at the earliest opportunity.
- 5.6 NASCO has a major role in fostering international cooperation on salmon matters and the Group is eager to see the development of these plans, and is willing to assist with their development and assessment. The Group is also aware from the German Implementation Plan that activities in the Netherlands may have an impact on salmon populations returning to spawning grounds in the Rhine. The Group noted that there could be potential salmon production or fisheries in other EU Member States and recommends that the Council seek clarification from the Head of the EU Delegation on the status of salmon populations and fisheries in other EU Member States, including the Netherlands and Belgium.

## **6. Arrangements for Special Session during the Twenty-Fifth Annual Meeting**

- 6.1 The Group noted that at the Twenty-Fifth Annual Meeting there will be an opportunity for it to present a brief report of its findings during a Special Session. This session would also allow for a report of the Second *Ad Hoc* Review Group on the first focus area, management of fisheries, and for contributions by the Parties on these reports. The Group felt that it would be useful to briefly summarise the process by which it completed the reviews and their outcome. It would also be appropriate to highlight that the standard of the plans has improved since the process started and that most jurisdictions have now developed plans. Finally it might be useful to identify lessons learned that might benefit future review groups, such as the approach used to ensure compatibility of the reviews and the importance of developing guidance to the jurisdictions to assist in preparing their plans and subsequent reports. The Group agreed to finalise arrangements for this presentation by correspondence.

## **7. Report of the Meeting**

- 7.1 The *Ad Hoc* Review Group agreed a report of its meeting.



**8. Any Other Business**

8.1 There was no other business.

**9. Close of Meeting**

9.1 The Coordinator closed the meeting and thanked all members of the Group for their very valuable and conscientious contributions to the two meetings. He was very much aware of their efforts to be consistent and fair. He indicated that any remaining work for the Group would be conducted by correspondence.

**IP(07)27**

**Second Meeting of the *Ad Hoc* Review Group on Implementation Plans  
NEAFC Headquarters, London, UK  
11 - 14 December, 2007**

***Agenda***

1. Opening of the Meeting by the Coordinator
2. Adoption of the Agenda
3. Review of Terms of Reference and consideration of working methods
4. Review of New and Revised Implementation Plans
5. Development of Recommendations on Adequacy of Implementation Plans
6. Arrangements for Special Session during the Twenty-Fifth Annual Meeting
7. Report of the Meeting
8. Any Other Business
9. Close of Meeting

**IP(07)28**

**Terms of Reference**

- (a) The *Ad Hoc* Review Group shall review and provide feedback to the Council on the adequacy of Implementation Plans submitted by the Parties or relevant jurisdictions.
- (b) In carrying out this task the *Ad Hoc* Review Group should *inter alia* seek to assess the conformity of these plans with the “Guidelines for the Preparation of NASCO Implementation Plans and for Reporting on Progress”, NSTF(06)10, and how well the plans lend themselves to evaluation in relation to the objectives of NASCO’s Resolutions and Agreements.
- (c) The *Ad Hoc* Review Group’s report will be issued to the Parties and NGOs at the earliest opportunity and presented at a Special Session during the 2007 Annual Meeting. At this Special Session the Parties will have the opportunity to respond to the *Ad Hoc* Review Group’s findings by reporting on any steps they have taken, or intend to take, to address the Group’s suggestions. Any revisions to the Implementation Plans will be submitted by the Parties within a period of two months after the 2007 Annual Meeting for final review by the *Ad Hoc* Review Group. In the event that the *Ad Hoc* Review Group still has concerns about an Implementation Plan the President would be asked to liaise with the Party concerned.
- (d) The *Ad Hoc* Review Group is not required to produce a unanimous report but to reflect all positions taken by members on the adequacy of the Implementation Plans presented and their alignment with the NASCO agreements and guidelines.

## IP(07)25 Definition of Terms

During the review of the draft Implementation Plans, it became apparent that terms and words had been interpreted differently by various Plan authors. In an effort to achieve consistency across the Plans, the Review Group worked to the following principles which are based on the Guidelines for the Preparation of NASCO “Implementation Plans and for Reporting on Progress, NSTF(06)10.

**Actions** are the core of the Implementation Plans. The actions are specific tangible activities that a Party or jurisdiction intends to undertake during the five year term of the Implementation Plan. After reading the section of an Implementation Plan describing management actions, the reader should clearly understand what will be done, how it will be done, when it will be done and how taking these actions contribute to the implementation of the relevant NASCO resolutions and agreements.

In contrast, **aspirations**, **goals** and **visions** identify longer term, desired end points and ideals. In general, actions are implemented as part of a strategy or plan to achieve a desired goal or vision.

To compare these two terms with an example:

A **vision** may be the elimination of escapes from aquaculture cages;

An **action** may be to require containment management systems for all marine cages by 2009.

**Measurable outputs** may be the **deliverables** that will result from taking the actions identified in the Implementation Plan or a **measure of success** of the action. If an action is taken by a Party or jurisdiction it should result in a change – this change is the measurable output, result or deliverable that flows from that action. The Guidelines state that in order for Implementation Plans to be effective it will be important for proposed actions and activities to have measurable outputs.

To further use the example above, a **measurable output** of the action of requiring containment management systems could be the demonstration that an auditable containment management system is in operation for all cage sites. Alternatively - or additionally – the measure of success may be the reduction in escapees detected in salmon rivers.

The Plans are intended to cover a five year period. It is important to identify the specific **timeframe** or **delivery date** for each action within the period of the Plan in order that progress with commitments can be tracked in the Annual Progress Reports submitted to the Council. This is not possible if all actions are expected to be delivered at the completion of the Plan.

The Guidelines further emphasize the importance of a process and measurable outputs that are open to critical evaluation and assessment in subsequent reporting. In advancing

Implementation Plans, NASCO had a stated desire to increase the transparency and accountability of Parties and jurisdictions in implementing NASCO agreements. This can only be accomplished if the Plans make it very clear what will be done and when it will be accomplished and if subsequent reports indicate whether the planned actions were implemented how and when planned and if they achieved the intended output.



MINISTERIO  
DE AGRICULTURA, PESCA  
Y ALIMENTACION

*El Director General de Estructuras  
y Mercados Pesqueros*

Mr. Malcolm Windsor  
Secretary  
NASCO  
Scotland UK

Madrid, December 14<sup>th</sup>, 2007

The North Atlantic Salmon Conservation Organization has been asking its Parties to report on their implementation plans in order to ensure the protection and conservation of salmon stocks.

The Implementation Plans are presented by Nasco as the best way to provide a general picture of the resource and to outline the existing management requirements, in place in different jurisdictions.

Spain is aware of the importance of that exercise and has fully agreed with the adoption of those plans for an appropriate management of salmon stocks.

The Spanish regions involved in salmon matters have recently undertaken the preparation of an Atlas of Salmon Rivers in Spain, that will probably be achieved in 2008. This document should be essential to adopt the management approaches according to Nasco Resolutions and Agreements in our country.

But, unfortunately, Spain has not developed for the moment any Implementation Plan as an overall strategy to protect the resource. Nevertheless, it's our intention to provide as soon as we can, the information required by Nasco on this subject.

Thanking you for your comprehension, I wish you a very happy Christmas and the best for 2008.

Yours faithfully,

CORREO ELECTRÓNICO:

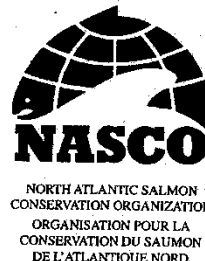
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CNL40.614

2 January, 2008



El Director General de Estructuras y Mercados Pesqueros  
Secretaria General de Pesca Maritima  
Jose Ortega Y Gasset, 57  
28006 - Madrid  
Spain

Dear Director General

This will acknowledge, with sincere thanks, your communication regarding the request by the NASCO Council that member Parties and their jurisdictions submit Implementation Plans to ensure conservation of wild salmon stocks.

We are very glad to hear that Spain recognises the importance of this exercise and agrees with it.

We understand the complexities of salmon management in Spain, with several Autonomous Regions involved, and are glad to hear that an inventory or atlas of salmon rivers is being drawn up as the first step in developing Implementation Plans for conservation measures. It is a pity that this was not ready for the December 2007 Review Group, but I feel sure that Spain will be able to make another statement on progress when we meet in Gijon next June. We are all very much looking forward to that meeting.

In the meantime, please accept my very best wishes for 2008.

Yours faithfully

Dr Malcolm Windsor  
Secretary

NASCO is an inter-government organization established by an international Convention

**Council**

**CNL(08)13**

***Report of the Fisheries Management Focus Area Review Group –  
Issues and Questions for the Parties***



***Report of the Fisheries Management Focus Area Review Group –  
Issues and Questions for the Parties***

1. The Council has agreed that each Party or Jurisdiction should prepare a Fisheries Management Focus Area Report to provide a more in-depth assessment of:
  - the measures already in place that address the NASCO Agreements relating to fisheries management;
  - further actions proposed within their Implementation Plans to meet those Agreements;
  - progress with implementing these actions.
2. The focus area reports are intended to provide the basis for evaluating the extent to which the fisheries management approach is meeting, or expected to meet, NASCO's goals to promote the diversity and abundance of salmon stocks and maintain all stocks above their conservation limits. To undertake this evaluation the Council established an *Ad Hoc* Review Group comprising Hugh-Campbell-Adamson and Sue Scott from the NGOs and Torsteen Overgaard, Ted Potter, Oyvind Walso and Tim Young from NASCO Parties. I served as Coordinator and the Secretariat facilitated the Group's work and provided the Rapporteur but we were not reviewers. The Group met in Toronto, Canada, during 29 April – 2 May and its report is attached.
3. The Group's functions agreed by the Council were as follows:
  - a. The *Ad Hoc* Review Group shall review and analyze the Fisheries Management Focus Area Reports prepared by the Parties or Jurisdictions.
  - b. In carrying out this task, the *Ad Hoc* Review Group should seek to assess the extent to which the information provided in the Fisheries Management Focus Area Reports indicates that NASCO's goals are being, or will be, achieved.
  - c. The *Ad Hoc* Review Group will meet in May 2008 to review the Fisheries Management Focus Area Reports submitted for the Special Session, and collaborate to highlight issues to be raised during the 2008 Special Session and to provide any questions to the Parties or Jurisdictions by 15 May, 2008.
  - d. Following discussions in the Special Session on Fisheries Management, the *Ad Hoc* Review Group should prepare a short report to be submitted to the President in the course of the 2008 Annual Meeting, suggesting additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements.
4. The Group has completed the first part of its work (functions a, b and c above) and the issues and questions it has developed are in Annex 4 of the attached report. These have been sent to the Parties and jurisdictions who have been asked to respond in their presentations at the Special Session focusing specifically on:

- how reference points (conservation limits and/or management targets) or alternative measures are used to define adequate abundance of the stock;
  - the management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity.
5. The Group believes that because of the limited time available at the Annual Meeting it cannot, within the 48 hours available, consider the information presented (including the clarification it has sought) and develop a fair and balanced assessment of the additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements (function (d) above). It is proposing to the Council, therefore, that the Parties send their responses to the Group's questions in writing to the Secretariat (or alternatively or additionally amend their focus area report to address the questions) by 31 July. Thereafter, the Group would complete function (d) with a view to providing a report to the President by 31 October 2008.
6. The Council is asked to consider the Group's report and decide on appropriate action.

Secretary  
Edinburgh  
12 May 2008

## **IP(08)15**

### ***Report of the Meeting of the Ad Hoc Review Group on Fisheries Management Focus Area Reports Fairmont Royal York Hotel, Toronto, Canada 29 April - 2 May 2008***

#### **1. Opening of the Meeting by the Coordinator**

- 1.1 The Coordinator, Dr Malcolm Windsor, opened the meeting and welcomed the members of the Group to Toronto. He referred to the work of the first *Ad Hoc* Review Group and noted that there were some lessons learned by that first Group that might assist with the assessment of the focus area reports. The first Group had undertaken a review of the structure and content of the Implementation Plans to ensure they were consistent with the Council's guidelines for developing these plans. Now, the task is to look at the adequacy of the measures concerning management of salmon fisheries in relation to NASCO's objectives of promoting the diversity and abundance of salmon stocks and maintaining all stocks above their conservation limit. He noted that the management of salmon fisheries is a central area in that is the clear responsibility of NASCO's Parties and is often the main tool used to rebuild stocks. The process of reviewing focus area reports in a transparent and inclusive manner is a vital element of the 'Next Steps' process. He stressed that the members of the Group from the Parties are representing the Organization and specifically not their Parties. The NGO representatives represent the international NGO community in NASCO. The Coordinator's role was to chair the meeting and facilitate the Group's work; he would not be one of the reviewers, nor would the Assistant Secretary who would also facilitate the Group's work and serve as Rapporteur. He also stressed that it was not necessary for the Group to reach unanimous agreement on its assessments although this would strengthen its report.

- 1.2 A list of participants is contained in Annex 1.

#### **2. Adoption of the Agenda**

- 2.1 The Group adopted its agenda, IP(08)14 (Annex 2).

#### **3. Review of Terms of Reference and consideration of Working Methods**

- 3.1 The functions of the Group as adopted by the Council, CNL(07)47, are as follows:
- (a) the *Ad Hoc* Review Group shall review and analyze the Fisheries Management Focus Area Reports prepared by the Parties or Jurisdictions;
  - (b) in carrying out this task, the *Ad Hoc* Review Group should seek to assess the extent to which the information provided in the Fisheries Management Focus Area Reports indicates that NASCO's goals are being, or will be, achieved;

- (c) The *Ad Hoc* Review Group will meet in May 2008 to review the Fisheries Management Focus Area Reports submitted for the Special Session, and collaborate to highlight issues to be raised during the 2008 Special Session and to provide any questions to the Parties or Jurisdictions by 15 May, 2008;
  - (d) following discussions in the Special Session on Fisheries Management, the *Ad Hoc* Review Group should prepare a short report to be submitted to the President in the course of the 2008 Annual Meeting, suggesting additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements.
- 3.2 The Group discussed its working methods. Prior to the meeting a listing of the ten elements to be included in the focus area reports had been agreed by correspondence, CNL40.517 (Annex 3). This list was based on the elements specified by the Council (CNL(07)47) but included some notes of clarification, developed by the Group, to assist the Parties in developing their focus area reports. This same list was used by the Group to develop a format for use in reviewing the focus area reports and to identify areas where further clarification was required. An initial reviewer was assigned to each plan from among the NASCO representatives and the NGOs also undertook initial reviews of all the plans. These initial reviews from the NASCO representatives and the NGOs formed the basis for deliberations by the whole Group and the development of the issues to be raised and questions for the Parties and relevant jurisdictions.
- 3.3 The Council had requested that the Group assess whether the information provided in the focus area reports indicated that NASCO's goals are being or will be achieved. NASCO's objectives for the management of salmon fisheries are to promote the abundance and diversity of salmon stocks and maintain all stocks above their conservation limit. The Group concluded that it could only undertake this assessment once it had received the clarification sought from the Parties and relevant jurisdictions to the issues and questions raised.
- 3.4 The Group agreed on a number of 'ground rules', based on those used by the first *Ad Hoc* Group to guide its work in undertaking the reviews. These were as follows:
- (a) The initial reviewers were asked to lead the discussion within the Group and to produce an initial list of issues and questions to the Parties to take into account any views from the Group;
  - (b) The initial reviewers would remain anonymous in the report and in the event that one or more members of the Group did not agree with a particular aspect or aspects of the review then the report would indicate that there were dissenting views but not disclose which members of the Group expressed the dissenting views unless they wished to be identified;
  - (c) The Group would base its reviews only on the information presented in the focus area reports and the final Implementation Plans;

- (d) Because not all jurisdictions were represented on the Group, it was agreed that the NASCO representative on the Group from a country whose focus area report was being reviewed would not be present during the review of that report;
- (e) While the Group recognized that the extent of the salmon stocks and the resources available to manage them varies markedly between jurisdictions, the Group took no account of these differences in undertaking its reviews;
- (f) The Group recognized that in some jurisdictions the responsibility for management of salmon stocks rests with the riparian owners while in others the resource is managed by the public sector. The Group felt that, nonetheless, governments have or should have powers to conserve the resource and it should therefore be possible to summarise in the focus area report the management actions that are expected to be taken by the appropriate bodies in the coming years. Such differences were not, therefore, taken into account in reviewing the reports;
- (g) Following the completion of the reviews all the issues and questions for each Party and jurisdiction were then re-examined to ensure consistency.

3.5 The Group noted that under its functions it is requested to highlight issues to be raised during the 2008 Special Session and to provide any questions to the Parties or Jurisdictions by 15 May, 2008. In the course of the 2008 Annual Meeting, the Group is asked to prepare a short report to be submitted to the President suggesting additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements. Because of the lack of time available during the Annual Meeting, other commitments during the Annual Meeting of the members of the Group and the Secretariat, and because of the importance that the task be carried out in a thorough, fair and balanced manner, the Group recommends to the Council that its report to the President be developed inter-sessionally and made available no later than 30 October. In this way, the Group believes it will be able to give adequate care and consideration to the actions that it may propose to the Parties and relevant jurisdictions to ensure consistency of fisheries management efforts with NASCO Agreements.

3.6 The Group reviewed the elements in document CNL40.517 and noted some general comments that related to many of the focus area reports. These comments are as follows:

- Item 1 requests a brief description of the fisheries including an overview of the stocks exploited, the gear types used, the location of the fishery and its magnitude, and current management measures and those planned. The information provided varied markedly and many reports did not provide a clear overview of the fisheries. The Group felt that it was valuable for the reports to include listing of salmon rivers with catches, conservation limits etc. and maps showing the location of rivers and management areas (see paragraph 5.3 below);
- NASCO's objective for the management of salmon fisheries is to promote the diversity and abundance of salmon stocks. Item 4 requests information on

diversity criteria and item 7c on the selectivity of the fisheries. Little linkage has been made between these two items in the reports;

- item 8 requests information on the expected effects of management measures and the timescale in which the measures would be expected to have these effects, but in most plans little information has been provided;
- item 9 requests an explanation of how socio-economic factors are applied in development of fisheries management actions. NASCO's Agreement on the Adoption of a Precautionary Approach states that management measures, taking account of uncertainty, should be aimed at maintaining all salmon stocks in the NASCO Convention area above their conservation limit taking into account the best available information, and socio-economic factors. In many cases the focus area reports noted economic benefits associated with the fisheries but few reports indicated how social and economic data are incorporated into decisions concerning management of the fisheries;
- item 10 requests details of the programmes that would be used to monitor the effects of management measures. The Precautionary Approach requires assessment of the effectiveness of management actions in all salmon fisheries. In most reports information is provided on the monitoring programmes to assess status of stocks but not those specifically designed to assess the effectiveness of the management measures taken.

3.7 These aspects will need to be addressed more thoroughly the next time the focus area is management of fisheries and further clarification of the information sought might be developed to assist the Parties and relevant jurisdictions. The Group recommends that the Council should again focus on the management of salmon fisheries in about three years time i.e. in 2011, after there have been focus area reports on habitat protection and restoration and aquaculture and related issues. This would allow progress with implementing the fisheries management measures in the Implementation Plans to be assessed but until 2011 the Group believes that there is little need for further reporting on the measures implemented.

#### **4. Review of Focus Area Reports in relation to achieving NASCO goals**

4.1 The Group is concerned that many of the focus area reports had been received well after the Council's deadline of 31 March 2008. This had meant that it had had very limited time to conduct some of the reviews and for the NGOs to consult the Organizations in the countries concerned. It was recognised that this was, in part, related to the fact that the final Implementation Plans were only due for submission by 11 February. The Group recommends that for future focus area reports an earlier deadline should be adopted, so that the *Ad Hoc* Review Groups have more time in which to undertake their important work. The Group recommends to the Council that future focus area reports be requested from the Parties no later than 31 December so that subsequent *Ad Hoc* review Groups could meet in the first quarter to carry out its review.

4.2 No focus area reports were available for six jurisdictions – Faroe Islands, France, Germany, Spain, Portugal and Sweden. Two of these jurisdictions (Spain and

Portugal) have not developed Implementation Plans either. The development of Implementation Plans and subsequent reporting on progress through focus area reports is an essential part of the 'Next Steps' process. The focus area reports provide a measure of just how jurisdictions are progressing in implementing their plans and consequently in achieving NASCO's objectives. The lack of focus area reports is a serious concern as there is no knowledge of whether NASCO's objectives are being met. The Group therefore recommends that the Council strongly urges those jurisdictions that have not yet submitted a report to do so at the earliest opportunity so that they can be reviewed by the Group before it completes its work.

4.3 The Group reviewed twelve focus area reports as follows:

- Canada, IP(08)9;
- Denmark (in respect of Greenland), IP(08)7;
- EU - Denmark, IP(08)12;
- EU - Finland, IP(08)3;
- EU - Ireland, IP(08)13;
- EU - UK (England and Wales) , IP(08)5;
- EU - UK (Northern Ireland) , IP(08)4;
- EU - UK (Scotland) , IP(08)2;
- Iceland, IP(08)10;
- Norway, IP(08)11;
- Russian Federation, IP(08)8;
- USA, IP(08)6.

4.4 The Group has not commented on the quality of the report itself in terms of format and clarity but only on the content and its consistency with NASCO's agreements. There was great variation in the length and clarity of the reports. Most reports had followed the format given in CNL40.517 (Annex 3) and this had facilitated the Group's assessments of the reports.

**5. Consideration of issues to be raised and questions for Parties/jurisdictions**

5.1 The Group has unanimously agreed issues and questions that it wishes to raise with the Parties and relevant jurisdictions for clarification but recognises that there is very limited time before the Annual Meeting for a response. It therefore proposes to the

Council that the Parties and jurisdictions respond to these issues and questions in their presentations at the Special Session focusing, in particular, on:

- any issues or questions concerning the status of stocks relative to the abundance criteria specified (item 3); and
- the management measures taken to control harvest (item 6).

5.2 Following the Special Session the Group recommends to the Council that the Parties and jurisdictions be asked to provide their responses to the issues raised and questions to the Coordinator in writing by 31 July. The Group does not believe that there is a need to revise the focus area reports unless a Party or jurisdiction wishes to do so. Once the Group has the responses it will be able to proceed to the final phase of its remit and suggest additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements.

5.3 There were some general aspects that the Group felt might be taken into account in developing future focus area reports on management of salmon fisheries:

- inclusion of tables listing all salmon rivers and fisheries with a brief summary of their nature and size e.g. wetted area, catches, conservation limits;
- inclusion of maps showing the major salmon rivers and management areas would provide some orientation and greater context to the descriptions in the text;
- provision of full accounts of how conservation limits or other measures of stock status are developed and applied;
- inclusion of flow diagrams of the decision-making process;
- clear cross-referencing of measures detailed in the focus area reports to the actions included in the Implementation Plan.

5.4 The issues and questions developed by the Group are contained in Annex 4.

## **6. Arrangements for Special Session during the Twenty-Fifth Annual Meeting**

6.1 The Group noted that it will be important to clarify the arrangements for the Special Session before the Annual Meeting so that the Parties and relevant jurisdictions are made aware of what is expected from them in their presentations. It is anticipated that the Group will present its report describing the process it has followed and the issues/questions it has developed. The Parties would then have the opportunity to present their focus area reports and address the issues/questions from the Group although it is proposed that the focus at the Special Session be on addressing any issues or questions concerning the status of stocks relative to the abundance criteria specified (item 3) and the management measures taken to control harvest (item 6). The Group noted that with sixteen implementation plans, although only twelve focus area reports, the time available for each presentation would be limited to no more than ten minutes per Party or jurisdiction and that a fuller response to the issues/questions



should be made in writing after the Annual Meeting. With regard to the Group's presentation it was agreed that after a brief introduction from the Coordinator there might be a description of how the Group conducted its work and then an overview of lessons learned for the work of future *Ad Hoc* Review Groups and what the fisheries management Review Group will be doing to complete its work. The Group agreed to develop its presentation and allocation of duties by correspondence.

**7. Arrangements for the Future Work of the Group**

- 7.1 The Group decided that it would resolve its future working arrangements in the light of the responses it received at and after the Annual Meeting. The final task is to suggest additional actions to ensure the consistency of fisheries management efforts with NASCO Agreements. This may require a further meeting of the Group

**8. Report of the Meeting**

- 8.1 The Group agreed a report of its meeting.

**9. Any Other Business**

- 9.1 There was no other business.

**10. Close of Meeting**

- 10.1 The Coordinator thanked all the members of the Group for their cooperative spirit and their valuable work in what was a vital element in the 'Next Steps' for NASCO process.

***List of Participants***

Mr Hugh Campbell-Adamson, Association of Salmon Fishery Boards, Scotland

Dr Peter Hutchinson, NASCO Secretariat

Mr Ted Potter, CEFAS, UK

Mr Torsteen Overgaard, Greenland Home Rule, Greenland

Ms Sue Scott, Atlantic Salmon Federation, Canada

Mr Oyvind Walso, Directorate for Nature Management, Trondheim, Norway

Mr Tim Young, Fisheries and Oceans, Canada

Dr Malcolm Windsor, NASCO Secretariat (Review Group Coordinator)

**IP(08)14**

***Agenda***

1. Opening of the Meeting by the Coordinator
2. Adoption of the Agenda
3. Review of Terms of Reference and consideration of working methods
4. Review of Focus Area Reports in relation to achieving NASCO's goals
5. Consideration of issues to be raised and questions for Parties/jurisdictions
6. Arrangements for Special Session during the Twenty-Fifth Annual Meeting
7. Arrangements for the Future Work of the Group
8. Report of the Meeting
9. Any Other Business
10. Close of Meeting

**CNL40.517*****Preparation of Focus Area Reports on Management of Salmon Fisheries***

The Council has asked each Party or jurisdiction to prepare a fisheries management focus area report to provide a more in-depth assessment of:

- the measures already in place that address the NASCO agreements relating to fisheries management;
- further actions proposed within their Implementation Plans to meet these agreements;
- progress with implementing these actions.

Background information on the NASCO Agreements relating to fisheries management is provided in Appendix 1. The Council has decided that the elements listed in paragraphs 1 to 10 below be included in the Focus Area Reports (see CNL(07)47)). The *Ad Hoc* Review Group has reviewed this list and has provided some additional notes of clarification, shown in italics below.

- 1. A brief description of the fisheries, including an overview of the stocks exploited, gear types, fishery location, magnitude of the fishery, current management restrictions and others planned.**

*Note on 1: Sufficient information is required to explain the full nature of the fisheries being managed, the management systems in place (including the control and reporting systems) and any planned actions to review or modify these. It should not be necessary to break this down to a highly detailed level. Some of this information could be provided in tabular form.*

- 2. Identification of exploited stocks and the reference points (conservation limit and/or management target) or alternative measures used to define adequate abundance of the stock.**

- 3. The status of the stock relative to the abundance criteria specified.**

*Note on 2 and 3: The use of reference points or alternative measures is a key element of the NASCO Agreements on managing fisheries. Information is therefore required on the methods being used or proposed, their state of development or implementation, and any planned actions to further develop or modify these. Information on specific reference points and the current status of stocks could be provided in tabular form.*

- 4. The extent to which the stock is meeting other diversity criteria (e.g. age groups, size groups, populations), if such information is available.**

*Note on 4: It would be useful to provide a general description of those diversity criteria that have been evaluated, their current status and any proposed actions to extend or modify the evaluation of stock diversity. (The way that this information is used in making management decisions is considered below).*

- 5. For mixed stock fisheries, the information in numbers 3 and 4 above should be presented for each contributing stock.**

*Note on 5: It has been noted that mixed stock fisheries may create particular problems for fisheries management and the report should therefore describe those mixed stock fisheries that still operate within the jurisdiction, the overall management approach to these fisheries and future actions that are planned. It should be made clear what criteria are used to define mixed stock fisheries.*

- 6. The management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity.**

*Note on 6: The Review Group will need sufficient information to be able to evaluate the powers for regulating fishing activity and/or harvest that are available or planned within the jurisdiction, any additional measures that may be used to protect and restore stocks, and any further actions that are planned (including measures to further reduce unreported catches).*

- 7. The extent to which the following issues are taken into account:**

- a. uncertainty in the assessments;**
- b. abundance of the stock/diversity of the stock;**
- c. selectivity of the fisheries;**
- d. any non-fishery factors affecting the stock;**
- e. other fisheries exploiting the stock.**

- 8. The expected extent and timescale of effects.**

- 9. An explanation of how socio-economic factors are applied in the development of fisheries management actions and how this affects the attainment of NASCO's goals.**

*Note on 7, 8 and 9: These are key elements within the NASCO Decision Structure, so the report will need to explain how they are, or will be, taken into account in the management process within the jurisdiction and any actions that are planned for the future. Under element 8, information is requested on the expected effects of the management actions identified in element 6.*

- 10. Programs that will be used to monitor the effect of the management measures and identify information deficiencies and timeframe for resolution.**

*Note on 10: The NASCO Agreement on the Precautionary Approach calls for the assessment of the effectiveness of management actions in all salmon fisheries. The report should therefore provide an overview of how this is or will be achieved.*

***Background on the Preparation of Focus Area Reports on Management of Salmon Fisheries***

The Guidelines for the Preparation of NASCO's 'Implementation Plans' and for Reporting on Progress, NSTF(06)10, adopted by the Council, indicate that reports to Special Sessions will provide an in-depth assessment of actions taken under the focus areas identified. The Council has agreed that the first focus area reports should be on the management of salmon fisheries. The Guidelines further state that these focus area reports provide the basis for review of management actions taken to meet the objectives of the Implementation Plan and assessment of the efficacy of these actions in addressing the overall objectives of NASCO, in particular the conservation and restoration of salmon stocks.

At NASCO's Twenty-Fourth Annual Meeting the Council reviewed document CNL(07)47 which provided guidance on the first focus area reports on management of salmon fisheries and which detailed the arrangements for the review. An *Ad Hoc* Review Group has now been appointed. To assist the Parties and jurisdictions in preparing their first focus area reports this document details how this group intends to conduct its review. It draws on document CNL(07)47 and aims first to summarise the main elements in the various documents developed by NASCO in relation to management of salmon fisheries and then details the issues that the *Ad Hoc* Group would wish to see addressed in the focus area reports.

NASCO has three agreements related to the management of salmon fisheries. These are:

- The Agreement on the Adoption of a Precautionary Approach, CNL(98)46;
- The Decision Structure to Aid the Council and Commissions of NASCO and the relevant authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries, CNL31.332;
- The Minimum Standard for Catch Statistics, CNL(93)51.

**Agreement on the Adoption of a Precautionary Approach**

This Agreement states that an objective for the management of salmon fisheries for NASCO and its Parties is to promote the diversity and abundance of salmon stocks. It further states that, for this purpose, management measures, taking account of uncertainty, should be aimed at maintaining all stocks above their conservation limit taking into account the best available information, socio-economic factors and other factors identified in Article 9 of the Convention. The Agreement indicates that application of the Precautionary Approach to salmon fishery management is an integrated process that requires at least the following:

- that stocks be maintained above their conservation limits by the use of management targets;

- that conservation limits and management targets be set for each river and combined as appropriate for the management of different stock groupings defined by managers;
- the prior identification of undesirable outcomes including biological and socio-economic factors;
- that account be taken at each stage of the risks of not achieving the fisheries management objectives by considering uncertainty in the current state of the stocks, in biological reference points and fishery management capabilities;
- the formulation of pre-agreed management actions in the form of procedures to be applied over a range of stock conditions;
- assessment of the effectiveness of management actions in all salmon fisheries;
- stock rebuilding programmes be developed for stocks that are below their conservation limits.

The Agreement also notes that measures to minimise unreported catches and to improve estimates of them are consistent with the Precautionary Approach and that NASCO and its Parties agree to evaluate and report on progress in this area.

### **Decision Structure to aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries**

In 2002, to assist with application of the Precautionary Approach to management of salmon fisheries and to provide a basis for more consistent approaches to management of exploitation throughout the North Atlantic, the Council adopted a Decision Structure. This Decision Structure incorporates many of the elements concerning management of fisheries contained in the Agreement on Adoption of a Precautionary Approach. It indicates that the management procedure for both single and mixed stock fisheries should:

- a) describe the fishery;
- b) specify the reference points (conservation limits and/or management targets) or alternative measures used to define adequate abundance of the stock;
- c) describe the status of the stock/stocks relative to the measure of abundance in (b);
- d) assess if the stock/or stocks is/are meeting other diversity criteria;
- e) assess if the stock is threatened by factors other than fisheries;
- f) describe the management actions that will be employed to control harvest including measures to address any failure or trend in abundance or diversity, taking account of pre-agreed procedures;
- g) provide an outline of the programmes that will be used to monitor the effect of the management measures, identifying information deficiencies and a timeframe for resolution.

The Decision Structure also indicates that fishery management decisions should take account of: uncertainty in the assessments; abundance and diversity of the stock(s); selectivity of the fishery; any non-fishery factors affecting the stock(s); socio-economic factors; and other

fisheries exploiting the stock(s). It also states that the expected extent and timescale of effects of management actions should be described. The Council has agreed Guiding Definitions of Terms Used in Salmon Fisheries Management (contained in document CNL(00)18) that include definitions of mixed and single stock fisheries, management targets and conservation limits.

### **Minimum Standard for Catch Statistics**

The Minimum Standard for Catch Statistics states that:

- catch statistics should include catches from all components of the salmon fisheries where these are retained;
- include returns to ranching units;
- include both the number and weight of salmon;
- be differentiated into sea-age class or alternatively into grilse and multi-sea-winter salmon;
- differentiate, where possible, between wild fish and those which have escaped from fish farms;
- include salmon caught in non-salmon gear where retention of such fish is legal;
- information on fishing effort should, wherever possible, be obtained for all components of the salmon fisheries;

It is further stated that the Parties wish to:

- encourage studies to assess non-catch fishing mortality in both salmon directed and non-directed gears in particular unreported catches;
- encourage measures to reduce the level of non-catch fishing mortality (in both directed and non-directed gears) in particular unreported catches.

The Council has previously agreed that the Parties should provide information on unreported catches on an annual basis. The information sought is details of the management control and reporting systems; estimates of unreported catch; details of how the figure is derived; information on the extent of catch and release fishing; and the measures taken to minimise unreported catches. Following the Special Session on Unreported Catches in Bar Harbor last June, the Council agreed that in the light of the information presented, the Parties might consider how the issues of improving estimates of, and further minimising, unreported catches can be incorporated into their implementation plans. It is proposed that the present reporting on the estimates of unreported catches and on the extent of catch and release fishing



be continued in the annual returns but that the other information concerning unreported catches be provided through the triennial fisheries management focus are reports

***Issues to be raised with, and questions for, the Parties and relevant jurisdictions***

**Canada**

*The Focus Area Report indicates that Canada has introduced major changes to the management of its salmon fisheries with the closure of all its commercial fisheries, restrictions on the recreational fisheries and development of agreements on the First Nation's fisheries. The Review Group seeks the following clarification of the information provided in the Focus Area Report:*

**Reference points:**

The Gulf Region Integrated Management Plan indicates that the present conservation limits will be retained until such time as more 'finite stock-specific conservation level criteria become available'. The report indicates that these will be developed nationally. What is the timescale for development of these criteria?

**Stock status and abundance criteria:**

The report indicates that there are about 900 salmon rivers and that about 70 of these rivers are assessed scientifically. This is a comprehensive monitoring programme, but almost half of these assessed rivers are in Quebec while in Labrador, where there is a mixed stock fishery, four rivers are monitored. Will the monitored sites in Labrador be maintained and are there plans to expand this monitoring in future?

**Mixed stock fisheries:**

The report refers to the introduction of measures, including prohibition of larger mesh nets, in 2006, to reduce the catch of large salmon in coastal areas of Labrador. The report indicates that the effectiveness of these measures will be evaluated and adjustments made if further reductions are warranted. What efforts are being made to determine the origin of the fish harvested in this fishery and what information is available on the effectiveness of the measures based on the evaluation of the fishery to date?

**Management actions:**

The report indicates that Canada's First Nations fisheries will continue to be subject to annual agreements. Are there any such fisheries exploiting stocks below conservation limits and, if so, what factors were taken into account in allowing a harvest?

The report refers to a Recovery Potential Assessment that is being undertaken for the Bay of Fundy stocks which are of special concern and protected by the Species at Risk Act. What is the timescale for completion of this assessment?

The report contains as annexes the management plans for Newfoundland and Labrador, Maritimes and the Gulf Region. There is no plan for Quebec. Does such a plan exist and can its key elements be summarised?

**Socio-economic factors:**

The Group is aware of a survey of recreational fishing in Canada conducted in 2005 and released in 2007. It is understood that the information on salmon fishing is not presented separately from other species. When will the information relating to salmon fishing contained in this report be made available?

**Denmark (in respect of the Faroe Islands and Greenland) – Greenland**

*The Focus Area Report indicates that in response to the scientific advice major reductions in harvest have been made by Greenland by operating only a subsistence fishery. Greenland has only one salmon river, the stocks exploited in the Greenland fishery originate in other countries and management measures for the fishery are agreed internationally within NASCO. The Review Group seeks the following clarification of the information provided in the Focus Area Report:*

**Management actions:**

The report refers only to the management of the current subsistence fishery. In the event that stock abundance improves and a commercial quota is allocated, how would such a fishery be managed?

It is reported that there is a discrepancy between the number of licences issued and the number of licences for which catch returns are made. What is known about the cause of this discrepancy?

The Review Group is aware that catches in the subsistence fishery have been increasing in recent years. The report indicates that a publicity campaign was instigated in 2006 and 2007 to improve catch reporting rates. What information is available on the success of this campaign in improving reporting of the catches in the subsistence fishery?

**European Union – Denmark**

*The Focus Area Report reflects the fact that the Atlantic salmon resource in Denmark is currently small as a result of significant habitat degradation in the past. Efforts are now being made to rebuild the stocks through stocking and habitat restoration work and a National Salmon Management Plan has been developed. The Review Group seeks the following clarification of the information provided in the Focus Area Report:*

**Reference points:**

It is noted that a target of at least 1,000 spawners annually has been set for each of four rivers. What is the basis for this target and what reference criteria are used for the management of other stocks?

**Diversity criteria:**

No information is available on the diversity of Danish salmon stocks. What efforts are being made to obtain such information and take account of this in the management of fisheries?

**Mixed stock fisheries:**

The report identifies mixed stock recreational fisheries operating in Danish coastal waters but provides no information on the contributing stocks. What information is available on the effects of these fisheries on individual stocks and how is this taken into account in the management of the fisheries?

**Management actions:**

The report refers to recreational fisheries in fresh water. What approach is used to control harvests in these fisheries, what account is taken of socio-economic factors and what is the proposed timescale for achieving the recovery targets?

**European Union – Finland**

*The Focus Area Report notes that the two rivers in Finland with Atlantic salmon fisheries are both border rivers with Norway and that their management is largely through bilateral agreements. There are significant challenges in managing salmon in a large system like the Teno where stock structure is complex but progress is being made towards managing the fisheries in accordance with NASCO's agreements. The Review Group seeks the following clarification of the information provided in the Focus Area Report:*

**Reference points:**

The Review Group recognises that progress is being made with the development of conservation limits. What is the timescale for establishing these and for utilising them in management in the rivers Teno and Naatamo?

**Stock status and abundance criteria:**

Concerns are raised about the abundance of MSW salmon from the upper tributaries and despite increasing effort in the recreational fisheries, catches in the last three years are among the lowest in the time-series. Given this information on abundance how is rod catch data being used to inform management of the fishery?

**Mixed stock fisheries:**

The report refers to net fisheries along the Norwegian coast. What actions have been taken to seek cooperation with Norway in the management of this mixed stock fishery?

**Management actions:**

The report indicates that while the management system for the majority of the fisheries is based upon a bilateral agreement dating from 1989 and is relatively inflexible, tourist angling is controlled in each country with regulations amended on an annual basis. What measures have been introduced or are planned to limit the tourist angling harvest, and is controlling this fishery alone sufficient to ensure conservation of the stocks?

**European Union – Ireland**

*The Focus Area Report indicates that there have been major improvements in the management regime for the salmon fisheries in Ireland. Consistent with the scientific advice, the coastal mixed stock fishery was closed at the beginning of 2007, and exploitation is now restricted to estuary netting and angling on stocks that are above their conservation limits. The Review Group seeks the following clarification of the information provided in the Focus Area Report:*

**Stock status and abundance criteria:**

The Review Group notes that management is based strictly on harvesting only the surplus above the conservation limits. What efforts are made to validate the status of the stocks using other measures of abundance such as juvenile surveys, etc?

**Diversity criteria:**

The report states that in many instances assessments are made for 1SW and MSW stocks separately. How are these assessments used in establishing the harvestable surplus for the fishery?

**Management actions:**

The report indicates that the Department of Communications, Energy and Natural Resources is advised of any measures that may be required for the management of stocks by the Regional Fisheries Boards (RFBs). What are the obligations on the RFBs to seek implementation of management measures in line with national policy.

**Socio-economic factors:**

The report refers to a hardship scheme which was introduced for the fishermen affected by the decision to move to single stock salmon fishing only. Does this scheme have any implications for the level of fishing permitted in the fishery?

The Review Group notes that since the closure of the mixed stock fishery, the bulk of the salmon harvested in 2007 was taken by the recreational sector. Reference is made to a direction from the Minister that there should be a re-balancing of the allocation of salmon quotas. What socio-economic and other factors will be considered in this re-balancing and will any reallocation to commercial fisheries be only to fisheries in estuaries rather than those in the ocean?

## **European Union – UK (England and Wales)**

*The Focus Area Report notes that stocks in England and Wales are managed through the use of river specific Salmon Action Plans and employs conservation limits and management targets for the majority of rivers. Significant progress has been made in phasing out mixed stock fisheries. The Review Group seeks clarification on the following points in the Focus Area Report:*

### **Mixed stock fisheries:**

The Review Group notes that the Precautionary Approach principle was adopted to phase out some mixed stock fisheries. Is this same approach being applied to the management of the remaining mixed stock fisheries?

The report indicates that ‘pragmatic decisions’ had to be made to define the boundaries between coastal mixed stock fisheries and estuary fisheries. What criteria are used to make these decisions?

### **Management actions:**

The Review Group notes that management plans are developed for the 64 ‘principal salmon rivers’ and the Severn estuary. What is the approach to managing any salmon stocks in the remaining rivers?

The report includes a flow diagram indicating how the need for fishing controls is evaluated. When options are identified, how is a particular option selected and subsequently implemented?

### **Timescales:**

The report notes that there is a 5-10 year cycle for reviewing fishery regulations. Is there an ability to respond more rapidly to unexpected changes in stock abundance or diversity?

## **European Union – UK (Northern Ireland)**

*The Focus Area Report reflects the fact that the fisheries in the Foyle system have been managed using reference points for more than thirty years and there is a programme to establish conservation limits on other rivers. Significant reductions have been made to the mixed stock coastal fisheries. The Review Group seeks clarification on the following points in the Focus Area Report:*

**Reference points:**

The report indicates that conservation limits have been established for a number of rivers. What is the timescale for developing conservation limits on the other rivers and how is the status of these stocks currently being assessed?

**Diversity criteria:**

While the report indicates that there is a small component of MSW salmon in the stocks it does not indicate how this influences fishery management. How are the fisheries managed to ensure the conservation of this stock component?

**Management actions:**

The report indicates there has been a reduction in the number of nets in the coastal mixed stock fishery. What is the policy with regard to the remaining nets, how will socio-economic factors be taken into account and what is the timescale over which this policy will be implemented?

**European Union – UK (Scotland)**

*The Focus Area Report reflects the fact that Scottish rivers produce a significant proportion of the wild salmon in the Southern North-East Atlantic region. Initiatives are underway to develop conservation limits or other indicators of abundance. There has been a very significant reduction in netting effort in recent decades although some substantial coastal mixed stock fisheries remain. The Review Group seeks clarification on the following points in the Focus Area Report:*

**Reference points:**

The report indicates that if useful conservation limits can be established they will be used to set management targets designed to ensure sustainable fisheries. How will the validity of these conservation limits be assessed?

The report indicates that until useful conservation limits are available management decisions have to be based on other measures of abundance and that rod catch data are considered to be a proxy for abundance. To what extent is the rod catch methodology described in the report being used to inform management decisions? What checks are in place to confirm the accuracy of the catch figures and what allowances are made in the methodology for the effects of environmental conditions and other factors on catches?

**Stock status and abundance criteria:**

The report explains that the Decision Structure was used to evaluate the need for conservation measures on the North and South Esks and the Annan. Is it being applied to other rivers, and if not what is the basis for making management decisions?

**Mixed stock fisheries:**

The report indicates that mixed stock netting accounts for 30% of salmon exploitation in Scotland. The decision structure was used to determine the need to close the Strathy Point mixed stock net fishery. What measures are being taken or planned to manage the other mixed stock fisheries so as to protect stocks that are not meeting abundance targets, and what are the timescales for their implementation?

**Management actions**

The report refers to the use of Statutory Instruments. What is their purpose and function, and what other management measures can be used to control exploitation?

**Iceland**

*The Focus Area Report indicates that salmon fisheries in Iceland are largely limited to angling and coastal mixed stock fisheries have been banned for decades. Effort in rod fisheries is limited and reporting of catches is believed to be very accurate. A programme for developing conservations limits is underway. The Review Group seeks clarification on the following points in the focus area report:*

**Reference points:**

Stocks are currently managed on the basis of maintaining stable catches but it is not clear how this is achieved, particularly considering that there is significant year to year variability in catches (the min-max ranges are typically around 5) and mean catches have changed significantly (both upwards and downwards) in individual rivers over the past 30 years. How are the catch data being used to establish the status of the stocks and to influence management decisions?

**Diversity criteria:**

The report indicates that there has been a substantial decline in the catches of MSW salmon in Iceland and that the Angling Clubs have, therefore, been requested to introduce catch and release policies. In 2006, 32% of MSW salmon were released. Does the Competent Management Authority (CMA) consider this to be adequate, what level of protection is afforded to MSW stocks in individual rivers and what will the CMA do if this voluntary approach is not successful?

**Management actions:**

The report indicates that the management proposals for in-river fisheries have to be set out in an Effort Plan prepared by the local Fishery Association. The Implementation Plan also



refers to both an Effort Plan and a Conservation Plan but the relationship between these plans and their roles in fisheries management are not clear. What do these Plans contain, how are the management controls determined and what powers do the CMA have to make changes?

It appears that the main driver for the management of Icelandic salmon fisheries is the maintenance of catch levels and thereby their economic value. What mechanisms are available to management authorities to respond to evidence of poor stock status?

### **Timescales:**

The report suggests that the development of conservation limits for all Icelandic rivers may take 5-10 years. However, the Icelandic Implementation Plan indicates that conservation limits will be prepared for all rivers by 2009. What is the expected timescale for development of conservation limits that will be used in fishery management?

## **Norway**

*The Focus Area Report reflects the fact that Norwegian rivers produce a significant proportion of the wild salmon in the Northern North-East Atlantic region, although a number of them have been severely impacted by acid rain and G. salaris. Norway is also one of the largest producers of farmed salmon and this has implications for the management of the wild stocks and their fisheries. A fishery management plan for the period 2008-12 has been developed to address the NASCO agreements. Substantial mixed stock coastal fisheries remain. The Review Group seeks clarification on the following points in the Focus Area Report:*

### **Stock status and abundance criteria:**

Preliminary conservation limits have been established for 180 rivers and a programme is in place to develop conservation limits for the remaining stocks by 2009. How is stock status being assessed to support the current round of management changes on rivers without conservation limits? As the conservation limits are regarded as preliminary, what is being done to validate them and in what timescale?

### **Management actions:**

The report indicates that fishery regulations for 2008 -2012 will be based on a number of sets of guidelines, and that County Governors are required to take these into account. What obligations are there upon local managers to follow these guidelines and how is the implementation of new management measures affected by private ownership of fisheries (e.g. in the coastal mixed stock fisheries)?

There are substantial numbers of fish farm escapees caught in Norwegian fisheries. How is this taken into account in assessing the status of stocks and determining the need for management measures?

The Review Group is aware that salmon from rivers in Finland and Russia are taken in mixed stock fisheries along the Norwegian coast. What actions have been taken to limit this interception to acceptable levels?

#### **Socio-economic factors:**

The report indicates that stakeholders are consulted during the development of new management measures. What effect do stakeholder views and socio-economic factors have on decision making?

### **Russian Federation**

*The Focus Area Report indicates that all fisheries for salmon in the Russian Federation are licensed, and there are comprehensive controls on exploitation by means of TACs and quotas, which are applied to all removals. Quotas in mixed stock fisheries are being reduced, and catch and release is widely employed in recreational rod fisheries. The Review Group seeks clarification on the following points in the Focus Area Report:*

#### **Reference points:**

Russia has developed conservation limits for the majority of its stocks, except those in Karelia, where data are limited and stocks are believed to be in a generally poor condition. The report indicates that in some rivers adult returns are very much larger than the conservation limits (e.g. more than 5 times), which suggests that the conservation limits may be too low. What process is there for reviewing whether the current conservation limits are correct, and how is the stock status determined in those rivers without conservation limits? What is the timescale for developing conservation limits in Karelia and how do the authorities currently use catch data to manage the fisheries.

#### **Stock status and abundance criteria:**

The Pechora river supports one of the largest salmon river stocks in the North Atlantic and has been well monitored for more than 30 years, but information on this river within the report is limited and it is not clear why the fisheries have been closed despite the adult returns being well above the spawner requirement. What was the basis for closing the fishery?

#### **Mixed stock fisheries:**

The report indicates that there is a policy to reduce the exploitation in the mixed stock salmon fisheries operating in the White Sea. What is the long-term management objective for this fishery and over what timescale will it be implemented?

#### **Management actions:**

The report indicates that all salmon fisheries are licensed and that TACs and quotas are used to control all harvests and other removals of salmon. How are the TACs established and how are quotas then allocated to the individual fisheries?

The report refers to illegal fishing in rivers flowing through populated areas and that 70% of

the returning stock may be taken illegally in the river Umba. What is being done to manage this illegal activity?

The report indicates that ‘users’ can adjust the fishing effort applied to different biological groups of salmon. How is the need for such adjustments made and how are they addressed by regulatory measures?

The report refers to possible by-catches in herring fisheries in the White Sea. What is being done to assess and manage this problem?

## USA

*The Focus Area Report reflects the fact that returns to rivers in the US are very low and that many of the salmon populations have been listed as endangered under the Endangered Species Act. As a consequence directed fisheries for Atlantic salmon are not permitted other than on reconditioned broodstock in two rivers and a more recent small catch and release fishery in the Penobscot River. Considerable efforts have also been made to eliminate by-catch of salmon. The Review Group seeks clarification on the following points in the Focus Area Report:*

### **Description of fisheries:**

The report states that the subsistence fishery off West Greenland could harvest 3 – 45 % of the total documented returns to the listed rivers during the years 2000, 2001 and 2002. What is the basis for this statement?

### **Management actions:**

The report refers to a wide range of measures to reduce by-catch of salmon in both marine fisheries and freshwater fisheries. These include public outreach and educational campaigns designed to reduce the potential for anglers to misidentify salmon. To what extent have these programmes been implemented?

The Review Group notes that the July 2006 Status Review for Anadromous Atlantic Salmon prepared by the state and federal agencies proposes that the rivers Androscoggin, Kennebec and Penobscot should be listed under the ESA. Is it proposed to implement this recommendation and if so in what timescale?

**CNL(08)33**

**Council**

***Focus Area Report on Protection, Restoration  
and Enhancement of Salmon Habitat***

***Focus Area Report on Protection, Restoration  
and Enhancement of Salmon Habitat***

The first phase of the Next Steps process focused on the development of Implementation Plans by the Parties. The *Ad Hoc* Review Committee that met in March 2006 reviewed these plans for uniformity with the Council's Guidelines for their preparation NSTF (06)10, and assessed how well the plans would lend themselves to evaluation in relation to NASCO's Resolution and Agreements.

Under the 'Next Steps' process, Focus Area Reports (FARs) (as described in NSTF(06)10) are intended to provide an in-depth assessment of measures, as reflected in Implementation Plans, to implement NASCO Agreements, Resolutions, and Guidelines. The FARs provide the basis for review of the current management approach and proposed actions and to assess their efficacy in addressing the overall objectives of NASCO and in particular, to conserve, restore and enhance salmon stocks.

The 'Next Steps' process identified three focus areas: Fisheries Management, Protection and Restoration of Salmon Habitat, and Aquaculture and associated activities. The Fisheries Management Focus Area Review was conducted in 2007/2008 and the second focus area is scheduled for 2008/2009. The second focus area selected is protection, restoration and enhancement of salmon habitat.

The primary relevant NASCO document is the "Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat", CNL(01)51. This Plan of Action identifies that NASCO's overall objective is to maintain and, where possible, increase the current productive capacity of Atlantic salmon habitat. Furthermore, Contracting Parties have agreed that they and their relevant jurisdictions should seek to:

- Protect the current productive capacity of the existing physical habitat of Atlantic salmon; and
- Restore, in designated areas; the productive capacity of Atlantic salmon habitat which has been adversely impacted.

**Focus Area Report on Protection, Restoration and Enhancement of Salmon Habitat**

Each Party or Jurisdiction will prepare a Focus Area Report by December 31, 2008, to provide an in-depth assessment of progress made and/or planned to address the elements identified within the Plan of Action. The proposed structure and contents of the Focus Area Report are as follows:

1. Introduction: Provide an overview of salmon rivers within the jurisdiction, with a map.
2. Describe the current status of salmon habitat and specify, to the extent possible, the quantity and quality of salmon habitat (historic and current).

3. Describe the process for identifying and designating priority/key habitat areas or issues to be addressed.
4. Describe the activities and approaches used to share and exchange information on habitat issues, and best management practices, between relevant bodies within the jurisdiction.
5. Description of Plans: Describe work undertaken and/or planned to establish comprehensive salmon habitat protection, restoration, and enhancement plans, and the extent to which these plans:
  - a. Identify impacts and potential risks to the productive capacity;
  - b. Include procedures for implementation, in a timely fashion, of corrective measures;
  - c. Place the burden of proof on proponents of an activity which may have an impact on habitat;
  - d. Address how the risks and the benefits to the Atlantic salmon stocks are weighed with the socio-economic implications of any given project;
  - e. Consider the effects of habitat activities on biodiversity in the area affected; and
  - f. Take into account other biological factors affecting the productive capacity of Atlantic salmon populations.
6. Overview of Ongoing Habitat Activities: Summarize ongoing or planned habitat work to demonstrate progress in implementing the salmon habitat protection, restoration and enhancement plans identified above in item 5. Where possible, quantify the extent to which habitat has been restored or enhanced, or describe other criteria used to evaluate progress.

**The *Ad Hoc* Review Group for the Focus Area Review on Protection, Restoration and Enhancement of Salmon Habitat**

The *Ad Hoc* Review Group shall:

1. Review and analyze the Focus Area Reports on Protection, Restoration and Enhancement of Habitat.
2. Prepare a report which includes the following:
  - a. Identification of common challenges in the FARs;
  - b. Identification of common management and scientific approaches to challenges, as reported in the FARs;
  - c. Compilation of recommended best practice with the intention of increasing the collaborative learning aspect of the 'Next Steps' Process; and
  - d. Recommendations and/or feedback for each FAR where additional actions may be helpful to ensure consistency with the "Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat."

The procedure the *Ad Hoc* Review Group will use to accomplish its work is as follows:

1. Meet in February 2009 to review the Focus Area Reports submitted, collaborate to highlight questions and/or issues to be sent back to the Parties/Jurisdictions by March 1, 2009. These answers should assist the *Ad Hoc* Review Group in preparing their report as outlined in item 2 above. Responses would be due from the Parties/Jurisdictions by April 1, 2009.
2. Provide a draft report, as described in item 2, by May 15, 2009 for circulation to contracting Parties prior to the annual meeting.
3. Present an overview of the draft report at the Special Session at the 2009 Annual Meeting, and facilitate a discussion on the five areas identified above in item 2. Parties and jurisdictions will not be expected to present their FAR during the Special Session, but may be asked to present information at the request of the *Ad Hoc* Review Group.
4. Following the Special Session, prepare a final report for submission to the President by August 31, 2009.

#### **Composition of the *Ad Hoc* Review Committee**

- a. The Parties to NASCO – 3 persons (to the extent possible reflecting balance among the membership and appropriate expertise);
- b. The Standing Scientific Committee – 1 person;
- c. Accredited NGO representatives – 2 persons (ideally one NGO from Europe and one from North America)

For 2008/2009, it was agreed that the persons representing NASCO would be Tony Blanchard (Canada), Paddy Gargan (EU), Sergei Prusov (Russian Federation) and Rory Saunders (USA). The NGO representatives will be nominated before 31 December 2008.

The Secretary should act as *Ad Hoc* Review Group Coordinator. The individuals appointed by Parties should act in the interests of NASCO and in a personal capacity, specifically not representing their Party.

#### **2. Schedule of Work**

|                   |   |
|-------------------|---|
| December 31, 2008 | Parties submit Focus Area Reports                                     |
| January 2009      | <i>Ad Hoc</i> Review Group members review FARs                        |
| February 2009:    | <i>Ad Hoc</i> Review Group meets to finalise review of FARs           |
| March 1, 2009:    | Questions and Issues sent back to Parties/Jurisdictions on their FARs |

|                 |   |
|-----------------|---|
| April 1, 2009   | Reponses due back from the Parties/Jurisdictions to Review Group  |
| April 2009:     | <i>Ad Hoc</i> Review Group conducts review of responses to see if questions were addressed and prepares draft report to the Council and for discussion at the Special Session |
| May 15, 2009:   | <i>Ad Hoc</i> Review Group provides draft report to the Secretariat for distribution prior to the annual meeting  |
| June 2009:      | Special Session   |
| August 31, 2009 | <i>Ad Hoc</i> Review Group submits final report to the President  |



## **Annex: Text from the Habitat Plan of Action**

NASCO, its Contracting Parties and their relevant jurisdictions should measure and improve progress in meeting this objective by:

- Establishing inventories of rivers for the protection and restoration of salmon habitat (See Annex 2);
- Regularly reporting on, and updating, these inventories;
- Identifying and designating priority/key habitats for improvement; and
- Sharing and exchanging information on habitat issues and best management practice.

Contracting Parties to NASCO and their relevant jurisdictions should establish comprehensive salmon habitat protection and restoration plans that aim to:

- Identify potential risks to the productive capacity and develop procedures for implementation, in a timely fashion, of corrective measures;
- Place the burden of proof on proponents of an activity which may have an impact on habitat;
- Balance the risks and the benefits to the Atlantic salmon stocks with the socio-economic implications of any given project;
- Maintain diversity;
- Take into account other biological factors affecting the productive capacity of Atlantic salmon populations, including predator-prey interactions.

In developing and implementing these inventories and plans, NASCO, its Contracting Parties and their relevant jurisdictions should seek to:

- Protect the current productive capacity of the existing physical habitat of Atlantic salmon;
- Restore, in designated areas, the productive capacity of Atlantic salmon habitat which has been adversely impacted.

**Council**

**CNL(08)14**

***Progress Report on Implementing  
a Public Relations Strategy for NASCO***

***Progress Report on Implementing a Public Relations Strategy for NASCO***

1. One of the themes of the Strategic Approach for NASCO's 'Next Steps' was the need for the Organization to better promote its work and achievements. Last year the Council received a report, CNL(07)16, from its Public Relations Group which had been asked to develop a clear public relations strategy aimed at enhancing NASCO's profile and ensuring the most effective publicity. In the light of the Group's findings the Council decided that, in the first instance, it would upgrade and improve the websites of NASCO and the IASRB and would develop a model 'State of the Salmon Stocks' document which would be easy to comprehend and attractively produced. The Council had also asked that the Parties provide details of educational programmes concerning wild Atlantic salmon for inclusion in a database of such programmes. This document summarises progress to date with these initiatives to enhance NASCO's profile.
2. During the year, there has been greater publicity for NASCO's work concerning salmon at sea. First, there was a joint one-day meeting organised with the Atlantic Salmon Trust that was held in Edinburgh on 17 October 2007. Second, the launch of the SALSEA-Merge project in Killybegs, Ireland on 16 May. Both events attracted considerable media attention. The Faroese, Norwegian and Canadian research cruises later this year and other work under the SALSEA Programme may also provide good opportunities for media coverage.

**Improving the websites**

3. The PR Group recommended that the Organization's websites should be our major medium and that in re-designing these the focus should be on making them more attractive to users, more informative and useful to stakeholders with improved links to other organizations. Efforts should also be made to increase the visibility of both websites by registering them with appropriate search engines. In the case of the NASCO site it was recognised that inclusion of the rivers database was a step forward and that the database of educational programmes should be included.
4. We have now completed the re-design of the website of the International Atlantic Salmon Research Board, [www.salmonatsea.int](http://www.salmonatsea.int). We have improved its appearance through a more contemporary design, greater use of photographs, more background information on the problems facing salmon at sea and detailed descriptions of the SALSEA Programme and progress to date, in particular with the SALSEA-Merge project and the North American SALSEA initiatives. The number of links has also been increased. It is still a work in progress and it will be expanded and developed further as the SALSEA-Merge and North American initiatives progress. Additional background information and further links will be included. With regard to increased visibility for the site, we have taken technical advice so as to achieve this. Separate searches using 'salmon research' and 'SALSEA' resulted in the IASRB's website being listed first out of up to 600,000 sites. We have received a number of favourable comments on the new site.

5. Work has now commenced on re-designing the NASCO site. This will be a larger undertaking although we intend to use a similar layout and design. We intend to structure the site around the key challenges identified in the Strategic Approach for NASCO (CNL(05)49) so as to provide the background to the issues and the actions being taken by NASCO and its Parties. Our aim is to have this site completed in the Autumn. We would very much appreciate photographs of salmon rivers, salmon fishing methods, research facilities and field work, and of the life stages of salmon etc for inclusion on the site. All material used will be acknowledged.

### **Education Programmes**

7. We have received information from the following Parties and jurisdictions:
  - Canada
  - EU (France, Ireland and UK)
  - USA
8. A database of these programmes has been created and it will be made available on the new NASCO website. Information on a total of 25 programmes has been provided although for some only the programme's name is currently available. Some information was provided on higher education courses in fisheries management and aquaculture. This information has not been included to date but it can be added if the Council feels that it is appropriate to do so.

### **State of Salmon Stocks Report**

9. The Public Relations Group had proposed to the Council that a new report, to replace the biennial report, should summarise in a clear and succinct manner the scientific advice concerning status of stocks, provide details of any existing, new or emerging threats to the resource, highlight the measures being taken by NASCO, its Parties and their relevant jurisdictions and accredited NGOs to conserve salmon, and provide details of any new research initiatives. It was further suggested that this should be an annual report that is well presented (including information presented in a pictorial and graphical form) that would be made available on the website for downloading. The Group believed that it would be cost-effective to make this annual report available on the website although it recognised that hard copies would be needed for media packs. The Group considered that the launch of this annual state of the salmon report should be newsworthy and attract media interest and could be the centrepiece of the PR strategy.
10. It is clear from views expressed to the Secretariat that there are some different opinions about the format of this report. While some appear to favour a relatively short paper others have referred to the 172 page booklet prepared by WWF in 2001 entitled 'The Status of Wild Atlantic Salmon: A River by River Assessment' as being a model to follow. The Secretariat is asked to develop a model 'State of the Salmon Stocks' document and it would assist us in that role if the Council could provide further guidance on the preferred format. The PR Group had suggested that this be an annual report which would perhaps suggest that a shorter format would be more appropriate. Turning to the elements that might be included these might be as follows:

(a) ***Status of Wild Atlantic salmon stocks***

This should be a brief, easily understandable summary of the current ICES advice and/or information provided in the Implementation Plans and the Annual Reports on these Plans. It should be free of scientific jargon (or clearly explain any terms used). This can lead to over-simplification but there would be liberal use of graphs and/or tables.

(b) ***Threats to the resource***

This section would draw on the information provided in the Implementation Plans. It could also draw on information on new or emerging threats as this is now an item on the Council's agenda with an annual request to ICES for information. Some threats, such as increased marine mortality, apply around the North Atlantic, while others may be specific to certain countries or regions.

(c) ***Overview of Management***

This section could summarise the management responses being taken or proposed both by NASCO and its Parties to address the threats identified in section (b). It would draw heavily on the information in the Implementation Plans, the Focus Area Reports and the Annual Reports. It could be structured along the lines of the Implementation Plans with information on management of fisheries; habitat protection and restoration; and impacts of aquaculture and there could be greater focus on each of these in different years in accordance with the cycle of FAR reporting.

(d) ***Ongoing Research***

This section could draw heavily on the IASRB's inventory but also on the information provided by ICES.

(e). ***Socio-Economic Values***

This section would summarise, again in easily understood terms, what is known about the social and economic values to society of the wild stocks. We already have a breakdown of the nature of all these values and the Working Group on Socio-economics has started the task of establishing an international data resource on social and economic information

11. The above five elements could form the basis for the "State of Salmon Stocks" report. These are very much initial ideas and we would welcome feedback from the Council both on the format and contents before proceeding further. If the Council agrees, a draft based on the information available to the Secretariat, could then be prepared and circulated over the winter with a view to updating it in the light of next year's advice from ICES so that it can be made available to the media around the time of the Twenty-Sixth Annual Meeting.

## **Conclusions**

12. On these PR initiatives we need to resolve the role of our NGOs. Their experience on the PR Group was invaluable and we have had joint PR initiatives with them since. I am aware from their Chairman, Chris Poupard, that they are able and willing to assist NASCO in this regard and in being more proactive in planning PR opportunities. It may be that there should be an informal network, perhaps including the NGO representatives who served on the PR Group and the Secretariat, which could communicate as necessary on all of the issues above and be proactive in identifying media opportunities.
13. Our experience with a pilot PR exercise conducted in the UK in 2005/2006 was that while media coverage undoubtedly did increase public awareness of NASCO's work, some articles in the popular press were inaccurate and focussed only on particular aspects where there might be conflict, such as the impacts of aquaculture. There will, therefore, be a need to ensure that messages such as Press Releases are supported by factual material on the organization's website. International Organizations like NASCO need to foster and maintain a reputation for factual and non-sensational publicity. Many elements of the popular press do not respond to this approach and our audience is probably best reached through excellent websites and more specialist journals, publications and symposia.

Secretary  
Edinburgh  
27 May 2008.



**Council**

**CNL(08)16**

***Liaison with the North Atlantic salmon farming Industry***



*Liaison with the North Atlantic salmon farming Industry*

1. Since NASCO's establishment, the salmon farming industry in the North Atlantic has grown dramatically from a production of under 30,000 tonnes in 1984 to more than 800,000 tonnes in 2006. While the industry has brought some benefits to the wild stocks there are concerns about adverse genetic, disease and parasite and other impacts. Scientific understanding of these impacts initially lagged behind the rapid growth of the industry but in response to information presented at three international symposia convened or supported by NASCO, the Council developed guidelines, the 1994 Oslo Resolution and the 2003 Williamsburg Resolution which provided recommendations to the Parties on measures to minimise adverse impacts on the wild stocks based on the best available scientific information. It is clear from information presented at the Bergen Symposium in 2005 that while the industry has made progress in addressing these impacts serious challenges remain particularly with regard to escapes of farmed salmon and sea lice. NASCO's Liaison Group with the salmon farming industry provides an international forum for cooperation between wild and farmed salmon interests that can make recommendations on wild salmon conservation and sustainable salmon farming practices to maximise potential benefits and to minimise potential risks to both.
2. In 2001 the Liaison Group developed Guidelines on Containment of Farm Salmon intended to achieve a level of escapes that is as close to zero as practicable. The following year a format was agreed for reporting on progress in developing Action Plans on containment, on the level of escapes and their causes and the effectiveness of the Action Plan. The Containment Guidelines were subsequently included, unchanged in the Williamsburg Resolution. While the development of these guidelines was a very positive step, it is fair to say that the Liaison Group has had some difficulties and, in 2004, a Statement of Commitment was developed in order to guide the future work of the group.
3. Last year the Liaison Group had agreed that, at its next meeting, it should share information on area management initiatives, hold a one-day session focussing solely on the level and causes of escapes and opportunities to minimise them, and encourage research into alternative sea lice treatments and make representations to the authorities urging that effective sea lice treatments are made available as quickly as possible where these are environmentally acceptable. A welcome development at this meeting was the participation of NGOs which NASCO had proposed for a number of years. The industry representatives had agreed to explore how they might support the SALSEA programme and they also indicated that they would develop a discussion document on how NASCO could support the salmon farming industry. This document, developed by ISFA and entitled 'Incentivising the Industry', CNL(07)30, was tabled at NASCO's Twenty-Fourth Annual Meeting. The NGOs indicated that the proposals by ISFA made an assumption that the salmon farming industry had already achieved the condition where it posed no threat to wild salmon. They considered that this was not the case and urged the Council to make a robust response. The Council noted the findings of the Bergen Symposium, the continuing high level of escapes as presented to the Liaison Group and the suggestion by ISFA of support for disseminating information on best practice and collaborative problem solving. The Council agreed to respond to ISFA proposing that a joint technical Task Force be set up with membership from the two Secretariats and two or three nominated experts from

NASCO and ISFA. The Task Force would, for the time being, replace the Liaison Group. The Task Force's proposed Terms of Reference were:

"Taking account of the findings of the 2005 ICES/NASCO Bergen Symposium, the joint ISFA/NASCO Trondheim Workshop and any other relevant scientific information regarding impacts from aquaculture on wild stocks, identify and agree on a series of best practice recommendations to address continuing impacts of salmon farming on wild stocks (e.g. escapes, interbreeding, sea lice infestations, disease transfers to and from the wild). These recommendations will be designed to achieve the impact targets established by the NASCO Parties."

4. In accordance with this decision the NASCO President wrote to the President of ISFA to express NASCO's concerns and to propose the establishment of the Task Force. At ISFA's request, I met informally with their President (Ms Nell Halse) and Secretary (Mr Knut Hjelt) in London on 22 April 2008. I again expressed NASCO's concern that the response from the industry suggested that all the problems had been solved and that NASCO should now promote salmon farming. I indicated that NASCO did not believe that the problems had been solved and could not see how the Liaison Group could continue if that were the starting point. The Representatives of ISFA indicated that they regretted that their communication had been seen in that way. They offered to make a response to clarify the situation. This they have done in the attached letter (Annex 1).
5. In the letter, ISFA indicates that it is eager to continue the relationship but they have not commented on our proposal for a Task Force which was a condition of the Council for re-engaging with the industry on issues of mutual concern. Rather ISFA would prefer that a full Liaison Group meeting be held in the US in March 2009, in conjunction with the Boston Seafood Show. At this meeting ISFA proposes that there would be presentations on industry initiatives such as bay management, the coordinated regulation and management of sea lice and the current status of containment measures. NASCO would report on measures to conserve the wild stocks. This more or less maintains the *status quo*. In my own view, at least, the relationship with the international salmon farming industry could be valuable but only if it is properly focussed and an effective forum for exchange of information and development of measures that would eliminate damage to the wild stocks from sea lice and escapees. That was the Council's intention in proposing the establishment of the Task Force.
6. The Council is asked to decide on any action needed.

Secretary  
Edinburgh  
12 May2008



## INTERNATIONAL SALMON FARMERS' ASSOCIATION

*Canada, Chile, Iceland, Ireland, Norway,  
Scotland, Tasmania, United States of America*

Sir Malcolm Windsor  
Secretary NASCO  
11 Rutland Square  
Edinburgh EH1 2AS  
Scotland UK  
Dear Malcolm

Both Knut Hjelt and I would like to thank you for your kind hospitality and for hosting us at a lunch meeting in London on Tuesday, April 22. It was unfortunate that the President, Ken Whelan, was not able to join us but we agreed that our meeting was valuable and helped to clarify some of the misunderstandings that have occurred over the past year. It became clear that our intentions in the document: "Incentivising the Industry" were not communicated effectively and were consequently not well received by NASCO.

As promised, I am writing this letter of clarification on behalf of ISFA to help dispel some of that misunderstanding and to clearly articulate our intentions. It is our hope that NASCO will consider this letter at the June 2008 meeting and will accept our proposal for confirming a Liaison Group meeting for March 2009 in Boston USA.

ISFA has been engaged in dialogue with NASCO through the Liaison Group since 1998. We agreed in London that this 10 year dialogue has been very beneficial to both the parties of NASCO and to ISFA. It is, in fact, the only real forum for the joint discussion and sharing of information on the status of wild Atlantic salmon and on best practices in the salmon farming industry. During those ten years, we agreed on Guidelines for Containment and member countries have been submitting annual Action Plans on how those guidelines are being met. Both industry and governments have taken the issues raised by NASCO on the potential interaction between salmon farming and wild Atlantic salmon conservation seriously and have maximized new technologies, applied innovative new methods and partnered with the science community in the development of best management practices to develop a more responsible and sustainable North Atlantic salmon farming industry.

At the Boston 2007 meeting of the Liaison Group, the industry raised the concern that NASCO was not recognizing the positive initiatives that have been taken to address issues of escapes and the management of sea lice and fish health. We also discussed the possibility of having NASCO support the industry's achievements in a more visible and proactive way. It was our intention to highlight the accomplishments that have been made by industry and by governments since the Liaison Group was first established, not to minimize NASCO's concerns over potential interactions between the farming sector and wild Atlantic salmon conservation. We recognize that potential interactions do exist and that it is our responsibility to manage diseases and parasites on our farms and to prevent escapes and that there is need for continued improvement.

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## INTERNATIONAL SALMON FARMERS' ASSOCIATION

*Canada, Chile, Iceland, Ireland, Norway,  
Scotland, Tasmania, United States of America*

ISFA has appreciated the liaison between our two groups as it has provided us with a good opportunity to build understanding and to share information about our responsibilities as they relate to our guiding principles. We would like to continue with this co-operation and invite NASCO to participate in a Liaison meeting with ISFA in Boston USA to coincide with the annual Boston Seafood Show in March 2009. This meeting will focus on two presentations: one by the International Salmon Farming Industry and one by NASCO. The industry will address the issues raised by Ken Whelan in his July 2007 letter. We will detail initiatives such as the Bay Management approach to farming, the subsequent dramatic reduction in the incidence of diseases such as the Infectious Salmon Anemia (ISA) on the east coast of Canada and the United States, the coordinated management and regulation of sea lice, the development of a DNA Marking system for farmed Atlantic Salmon in the United States, and the current status of containment and escapes in each of the jurisdictions around the North Atlantic. The presentation will also refer to various science and technical groups that exist to address ongoing issues and gaps in knowledge.

We invite NASCO to make a similar presentation on the measures that have been taken to conserve wild Atlantic salmon and their outcomes.

We believe these presentations will help to clarify both operational practices and the science base for these practices as well as the many mechanisms that already exist for pursuing and distributing the science expertise that is currently available. Such a liaison meeting will give us an update on actions taken, ongoing challenges and possibilities and expectations for the future. This would include a thorough discussion about the way forward for the liaison between NASCO and ISFA. We hope therefore that we can agree on such a meeting. ISFA's President and Secretary will commit to a meeting with the President and Secretary of NASCO in the fall of 2008 at a location that is mutually agreed to prepare for the March 2009 Liaison meeting. This will ensure that the Liaison meeting agenda is well thought out beforehand and that all the necessary background work has been completed.

In keeping with the Guiding Principles of the Liaison Group, we welcome ongoing dialogue with NASCO and trust you will join us at a Liaison meeting in March 2009.

Nell Halse  
President

cc: Knut Hjelt, FHL Norway ISF A members

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**Council**

**CNL(08)23**

***2007 US Emerging Threats and Opportunities***

*2007 US Emerging Threats and Opportunities***Opportunities****Estuarine and Coastal Migration and Survival of Wild Atlantic Salmon Smolts in Maine Using Ultrasonic Telemetry**

NOAA's National Marine Fisheries Service (NMFS) used telemetry to assess smolt survival and migratory behavior with the objective of determining survival, speed of passage, behavior and choice of migratory pathway through river, estuary and bay. About 100 wild smolts were collected annually from rotary screw traps in the Narraguagus River and then surgically implanted with Pinger tags from 1997-1999 and 2002-2004. The smolts were collected near the peak of the emigration and were only slightly larger than the average outmigrating smolt. The second period of releases coincided with a change of equipment that increased receiver resolution in the estuary and bay. Results indicate a mean transit speed of 0.87 kilometers per hour. The slowest transit speeds were documented in the river (0.38 kilometers per hour) and speed generally increased from the river through the estuary, middle and outer bay. Speed of passage was influenced (decreased) by the number of times the smolts reversed direction while moving downriver. Multiple reversals were possible and did not appear to impact survival. It is interesting that the smolts were observed to move into the bay through a pathway that is narrower than the available options.

From 62-74% of the smolts survived to reach the estuary. About 41-54% of the smolts reached the middle bay and 36-47% reached the outer bay alive. Overall about half the salmon were lost as they moved from the river to the outer bay. The tags are generally not recovered so it can only be assumed that the tags may have stopped working (unlikely) or that the smolts have died and been removed from the system. The application for these study results could be to inform management decisions about the timing and location of approved dredging permits, for example, since the speed and migratory behavior is seen to be fairly predictable.

**Feeding Ecology of Atlantic Salmon Postsmolts in Penobscot Bay, Maine – Does Origin Matter?**

NMFS conducted this diet study in concert with a post-smolt trawling survey from 2001-2005 in Penobscot Bay. The trawling survey involved live capture and release of Atlantic salmon smolts in the upper, middle and outer bay and offshore in the Gulf of Maine. A total of 242 out of the 3,843 smolts collected were lethally sampled for stomach content analysis. The origin of these lethally sampled smolts varied. There were seven naturally reared (or wild) salmon (in river 24 months), nine parr (in river 20 months), 32 parr (in river 8 months), and 194 recently released smolts (in river less than one month). Results indicate the overall stomach content or diet composition as follows: 24% Atlantic herring, 24% fish remains, 6% miscellaneous fish, 30% Eupausiids, 7% miscellaneous crustaceans, 6% Polychaete worms, and 3% other. The diet composition shifts as the fish move from upper bay to the offshore sites. More herring were found in smolts in the upper bay while less herring and more miscellaneous fish were observed in the guts of fish offshore.

The most striking difference in the diet composition depended on smolt origin or how long the salmon had been living and feeding in the wild. Stomach composition for the naturally

reared salmon and 20 month parr was about 75% fish whereas less herring and more Eupausiids were found in the 8 month parr and hatchery stocked smolts. The diet composition is important because the energy available from different prey items is significant: Atlantic herring 10.6 Kj/g, miscellaneous fish 6.1 Kj/g, Euphausiids 3.4 Kj/g, miscellaneous crustaceans 3.2 Kj/g, and Polychaete worms 3.7 Kj/g.

Generally the stomach weight to smolt weight ratio was higher for smaller fish and lower for larger fish (the hatchery smolts). So, the trend in available energy is greater for the smolts that spent the greatest amount of time in river and the least for the recently released hatchery smolts. In other words, smolt origin matters. It's not clear how much this matters – it is possible that recently released smolts haven't learned to eat live prey fish or that they are less motivated at first because of higher body fat content which might lead to a lag in feeding behavior. Still, these results may hold implications for stocking management.

### **Penobscot River Restoration and Multispecies Management Plan**

The Penobscot River Restoration Trust was formed in 2004 as part of a multi-party settlement agreement with dam owner Pennsylvania Power and Light (PPL) and the Federal Energy Regulatory Commission (FERC). The settlement, which was signed by the U.S. Department of Interior's Bureau of Fish and Wildlife and Indian Affairs, the National Park Service, the State of Maine, the Penobscot Indian Nation and several non-governmental organizations, details conditions for dam removal, fish passage, and operational changes at eight hydroelectric projects on the lower Penobscot. The Penobscot Trust has a 3-5 year option period during which time the dams must be purchased. The Penobscot Trust and partners reached significant milestones in late 2007 by raising the \$25 million needed to purchase the Veazie, Great Works and Howland Dams. Ten million dollars of the raised money was from the FY08 Omnibus Appropriations Bill passed in December 2007 will be directed to the Penobscot River Restoration Project through the NMFS. The funding was part of the Commerce, Justice, Science Bill included in the omnibus funding measure. The Penobscot Trust continues to work with partners to raise the subsequent funding to implement the removals, alterations, mitigation and economic development elements of the project. In addition to the initial purchase price of \$25 million dollars, the preliminary estimate for project implementation, including dam removal and modifications, economic development and mitigation, is approximately \$30 million.

In anticipation of the restoration potential of the Penobscot River Restoration Project, Maine Department of Marine Resource's (MDMR) Bureau of Sea-Run Fisheries and Habitat in conjunction with Maine Inland Fisheries and Wildlife (MIFW) have completed a draft strategic management plan for diadromous fish in the Penobscot. This plan includes four strategic goals: (1) coordinating management activities, (2) providing safe and effective upstream and downstream passage for diadromous fishes, (3) maintaining or improving abiotic (physical) and biotic habitat for diadromous fishes using ecosystem-based management, and (4) rebuilding diadromous fish populations. NMFS has provided comments on drafts of this plan and in November 2007 a public scoping meeting was held. In March 2008 the Penobscot Interagency Technical Committee (PNITC) was formed to develop operational management plans for diadromous fish within the basin. Members of the PNITC include managers and scientists from MDMR, MIFW, NMFS, the Penobscot Indian Nation (PIN), and FWS.



The Penobscot River Restoration Project (PRRP) provides unique opportunities for restoration efforts. Many species will benefit from the PRRP directly, but many other passage impediments exist in the basin. Some diadromous fish species, such as Atlantic salmon, alewife, and shad, may require additional habitat improvements (barrier removal, fishways, etc.) or stocking. Thus, additional active restoration measures may be required to realize the full potential of the PRRP. Due to the high profile of the project and the high costs involved, there is a need to prioritize restoration efforts in the basin to increase the probability for project success. There are many ways to determine what a “successful” PRRP would look like. The PNITC has been tasked with developing one set of restoration goals and priorities for the basin. To help facilitate this goal, NOAA has begun developing an ecologically-based GIS tool to help set goals and to help identify and prioritize various restoration efforts. The outputs of this tool will help to ensure that achievable goals are established, and that funding and restoration efforts are applied in the most appropriate manner.

### **Coastal Fish Communities**

There are two ongoing Alosid restoration programs in the Gulf of Maine. One program mainly focuses on American shad restoration through culture activities, although it does conduct some adult river herring trapping, transport, and release for restoration in rivers with diminished runs. Most shad and river herring releases occur in the Merrimack River and drainage, but the program also has activities from the Kennebec River down to the Pawcatuck River. This program is seeing limited success, and major issues are shad egg production and survival at Nashua National Fish Hatchery (partially due to State regulations prohibiting formalin use), shad and river herring brood collection during large floods, lack of river herring brood sources because of the region wide population collapse that began in 1992, and the political resistance to stock river herring brood into some premium historical but extirpated habitat. As a result, there is some question whether restoration efforts should be focused on culturing shad at all in systems where shad exist and instead working harder to open up fish passage. The other restoration program focuses on trapping, trucking, and releasing alewife brood; pumping alewife brood around dams; and shad culture activities in the Kennebec River and drainage. This program is seeing more success with both culture activities and alewife transport, and the upper Kennebec River is experiencing a rapid shad population increase. Issues mostly revolve around increasing fish passage and political resistance to stock alewife brood into some premium historical but extirpated habitat.

US scientists and managers at the US Atlantic Salmon Assessment Committee agreed that restoration of all diadromous fish needs to be a priority for Atlantic salmon restoration; diadromous fish restoration and Atlantic salmon restoration need to be integrated into a broader program in support of each other; strategic planning including all diadromous fish biologist / manager partners is needed; the sequence of stock and species rebuilding could effect results; expectations about Alosid restoration success needs to be managed; restoration activities and dam removals could complicate salmon assessment, requiring a shift in assessment and a need for different data collection; and a study of large waters is needed to examine restoration effects on lower river ecology.

## **Threats**

### **Infectious Pancreatic Necrosis**

Infectious pancreatic necrosis (IPN) is a viral disease that is transmitted both horizontally (fish to fish) and vertically (parent to offspring). IPN is widely distributed, but has not been a problem in the United States. Norway and Scotland have both experienced outbreaks. It was noted that in both cases the outbreaks occurred approximately 10 years after the first detections.

IPN was identified from two, pooled sea-run Atlantic salmon ovarian samples from Richard Cronin National Salmon Station (RCNSS) on October 15, 2007. The samples were a composite of ovarian fluid from 5 female Atlantic salmon. Samples were confirmed positive for IPN using cell culture and polymerase chain reaction assays. As a result, the entire year class of Atlantic salmon at RCNSS and eggs shipped to White River National Fish Hatchery were destroyed. Subsequent PCR assays and histology of kidney, spleen, blood and pancreatic tissue produce negative results. USGS Western Fisheries Research Center identified the IPN isolate to be similar to the Canada 3 genotype, which is different than IPN genotypes known from the Connecticut River. RCNSS has and continues take measures to isolate pools by using glass panels to reduce the possibility of transfer via splashing and vapors as well as measures to eliminate cross contamination.

IPN represent a critical threat to Atlantic salmon recovery. The introduction and discovery of IPN at any hatchery facility will result in loss of genetic diversity and the loss of one to three year classes. Current procedures for screening and isolating fish are inadequate to protect against an IPN outbreak. Options for IPN mitigation, prevention and screening need to be investigated.



**Council**

**CNL(08)17**

***Interim Report of the Socio-Economics Working Group***

## CNL(08)17

### *Interim Report of the Socio-Economics Working Group*

1. In both 2003 and 2004 the Council held Technical Workshop meetings on the social and economic aspects of the wild Atlantic salmon (see documents CNL(03)18 and CNL(04)23 respectively). These meetings resulted in the development of:
  - a listing of all the elements making up the wild Atlantic salmon's economic value and impacts;
  - broad guidelines on the type of economic analysis that would be needed to produce estimates of value and the data required;
  - guidelines for incorporating social and economic factors in decision under the Precautionary Approach CNL(04)57.
2. It is clear from the information presented at these technical Workshops that the Atlantic salmon has many aspects to its value and that, in addition to the values associated with the fisheries, the salmon is a highly prized species and an indicator of environmental quality. This 'existence value' of the wild salmon, although rarely quantified, may greatly exceed the values associated with the commercial and recreational fisheries, because of its iconic status with the general public. NASCO's guidelines (CNL(04)57) were intended to assist administrators and decision-makers by ensuring that the long-lasting and widespread values associated with the wild Atlantic salmon are fully incorporated and given due weight in decisions in relation to management of the resource and its habitats.
3. Under the Strategic Approach for NASCO's 'Next Steps', CNL(05)49, the key issues identified in relation to the social and economic aspects of the wild Atlantic salmon are:
  - ensuring that appropriate emphasis is given to the social and economic aspects of the wild Atlantic salmon;
  - strengthening the socio-economic data as a basis for managing salmon;
  - integrating socio-economic aspects in decision-making processes; and
  - disseminating socio-economic information to ensure due weight is given to the salmon compared to other important commercial and public interests.
4. To progress these aspects the Council established a Working Group on Socio-Economics which met in Reykjavik during 4 - 6 March 2008. The report of the meeting is attached. This is only an interim report and the Group's Terms of Reference allow for more than one meeting.
5. The Group noted that the collection, analysis and integration of socio-economic information to aid management is far behind the collection, analysis and integration of biological information. The main task for the Group was, therefore, to develop an international collation of available social and economic information on the wild Atlantic salmon so as to allow the wild Atlantic salmon to be assessed at its rightful social, economic and cultural levels. This collation is contained in Annex 3 of the report. Summary tables of the information were developed although the Group

stresses that these are intended only to aid review of the large volume of information presented. The Group urges the Council to request that those countries that have not yet provided information contribute to this important new data resource. With regard to integration of social and economic information into decision-making, the Group reviewed progress in developing a bio-economic model which has been adapted for use with recreational fisheries. This model will now be tested using data from Scotland and/or Norway. The Group also noted that there has been little exchange of experience in using NASCO's socio-economic guidelines and welcomed the proposed inclusion of social and economic aspects in the Focus Area Reports under the Implementation Plans.

6. The Group noted that there are many threats to the wild stocks and that those advocating salmon conservation and restoration will need all the factual information available to support their case. In this regard the results of a new study on the 'existence value' of salmon in England and Wales suggest that consideration of these values will add enormously to the total value of the resource. This study indicated a willingness-to-pay to prevent a severe decline in salmon stocks from a disease (an analogy for *G.salaris*) totalling £350 million per year when aggregated across all households. Thus consideration only of the values associated with **use** of the resource will greatly under-estimate the salmon's full value. The **existence** value dwarfs the user values. The Group will continue to work inter-sessionally through a sub-group with a further full working group meeting prior to the next Annual Meeting when a more comprehensive report will be made to the Council.

Secretary  
Edinburgh  
9 April 2008

## **WGSE(08)19**

### ***Report of the Meeting of the Working Group on Socio-Economics***

**Grand Hotel, Reykjavik, Iceland**

**4-6 March 2008**

#### **1. Opening of the Meeting**

- 1.1 The Chairman, Dr Malcolm Windsor, opened the meeting and welcomed participants to Reykjavik. He noted that the level and extent of socio-economic advice available to NASCO and the Parties is, on the whole, far behind the biological advice. Given that fisheries management is largely about managing what people do and not what the fish do the Council had asked that NASCO start the process of incorporating social and economic data into management. When NASCO started its work on the Precautionary Approach in the late 1990s it was stressed that incorporating social and economic factors in management decisions should not undermine the effectiveness of the approach. Technical workshops had been organised by NASCO in 2003 and 2004 and had resulted in the development of:

- a listing of all the elements making up the salmon's economic value and impacts;
- broad guidelines on the type of economic analysis that would be needed to produce estimates of value and the data required;
- guidelines for incorporating social and economic factors in decisions under the Precautionary Approach.

He noted that the salmon is a complex species with many aspects to its value and that the non-use values may greatly exceed the values associated with the fisheries. He concluded that the challenge for the meeting would be to attempt the first comprehensive international collection and collation of information on the social and economic aspects of salmon and to consider further approaches for assessing social and economic values and for integrating social and economic factors into management decisions. He concluded that the Group's work should assist those charged with conserving wild salmon in ensuring that the salmon 'punches at its full weight' when it faces threats from other industries or endeavours. He thanked Mr Arni Isaksson for his help in arranging the meeting and the US and Norway for developing the Terms of Reference.

- 1.2 Mr Arni Isaksson of the Icelandic Food and Veterinary Authority and Vice-President of NASCO welcomed participants to Iceland.
- 1.3 A list of participants is contained in Annex 1

## **2. Adoption of the Agenda**

- 2.1 The Working Group adopted its agenda, WGSE(08)17 (Annex 2) after including a new item 8 ‘Conclusions and Recommendations’.

## **3. Consideration of the Terms of Reference and Working Methods**

- 3.1 The Working Group reviewed its Terms of Reference as agreed by the Council of NASCO, CNL(07)59. It was noted that these TORs had been drafted in a broad way to allow the Group some flexibility in the way it worked but the objective was to further develop information on the social and economic aspects of the wild Atlantic salmon, and make recommendations for its integration into management decisions, so as to support salmon conservation.
- 3.2 Prior to the meeting a discussion document with proposals for the focus of the Group’s work had been developed by Norway, WGSE(08)2. This document proposed that the first task for the Group is to identify the basic key data and information that is available and needed to assist in describing the status of the social and economic aspects of wild salmon. Norway had developed a listing or ‘wish list’ of the information that might be collected, WGSE(08)3, and each jurisdiction had been requested to supply this information prior to, or at, the meeting. Such a collation of information by country, if updated, would assist in identifying changes in certain social and economic aspects over time and might encourage the collection of additional information to address deficiencies in a consistent way. The Group felt that, in a similar manner to the scientific advice, this collation of information could be beneficial to managers and inform their decision-making even if modelling approaches could not be developed in the short-term. The discussion document also proposed that the Working Group could devote some time to further consider approaches to assessing economic values and their integration into management decisions. The Working Group agreed with this approach.

## **4. Presentation of basic key data and information necessary to describe the social and economic aspects of wild salmon**

- 4.1 The Group discussed to what extent the information requested in the ‘wish list’, WGSE(08)3, was duplicating the information already provided to NASCO through the Implementation Plans developed by the Parties and their relevant jurisdictions. The Assistant Secretary presented an overview of the background to the development of the Implementation Plans and the progress to date. While it was recognised that there may be some duplication of information, particularly with regard to the description of the fisheries, the Implementation Plans detail the management measures to be taken over a five year period to implement NASCO’s agreements but do not contain the social and economic data sought by the Working Group. Furthermore, while the focus area reports on the Implementation Plans should provide an outline of how social and economic factors are being incorporated into management decisions these reports would also not be expected to provide the social and economic data.
- 4.2 The Group agreed that the ‘wish list’ should be amended so as to allow for presentation of information on subsistence fisheries separately from commercial



fisheries and that information on the profitability of commercial fisheries should also be provided. Using the revised format for the 'wish list' WGSE(08)18, social and economic information was presented for EU - UK (Scotland), WGSE(08)4, EU - UK (England and Wales), WGSE(08)5, the Russian Federation WGSE(08)6, Greenland, WGSE(08)7, Iceland, WGSE(08)10, EU - Ireland, WGSE(08)11, Canada, WGSE(08)13, the United States, WGSE(08)14 and Norway, WGSE(08)15. The Group noted that this information provided a valuable snapshot of social and economic information that would be of value in support of salmon conservation. It may also assist the Council in developing its 'State of the Salmon' report which will be one of the main public relations' tools for the Organization. The Group noted that for modelling purposes there would be a need for time-series of trends in, for example, the number of fishermen, market values etc.

- 4.3 It was also noted that while there was valuable social and economic information particularly with regard to the fisheries, there were major gaps in the available information particularly with regard to the non-consumptive uses and existence values. However, a study conducted since the second Technical Workshop in 2004 indicated that the existence values of salmon could be enormous and greatly exceed the values associated with the fisheries. This assessment of the total value of salmon to the general public in England and Wales showed that the average willingness-to-pay per household to prevent a severe decline in salmon stocks from the parasite *G. salaris* amounted to £350 million per year when aggregated over all households.
- 4.4 The complex and very hard to quantify values of subsistence fisheries to dependent communities were also lacking. With regard to food, social and ceremonial fisheries, First Nations of eastern Canada have, since time immemorial, accessed and used natural resources found within their traditional territories for the benefit of community, family and individual. First Nations continue to rely on Atlantic salmon for food, social and ceremonial purposes. This is a priority right to fish for food, social and ceremonial purposes over recreational and commercial fisheries. Atlantic salmon continue to be fished by forty First Nations communities and by the larger population of off-reserve peoples in eastern Canada. With regard to subsistence fisheries, according to the agreement between NASCO and Denmark (in respect of the Faroe Islands and Greenland), Greenland has agreed temporarily not to set a quota although it is entitled to do so. Instead, Greenland allows a subsistence fishery for salmon which is considered necessary for the food supply of the Greenlandic population especially considering the population of the settlements of the coast of Greenland. This fishery is important for upholding the variety of food supply and is considered an essential supplement for the low income groups in Greenland. Self-sufficiency from natural resources is an integral part of the Greenlandic culture and has through generations been considered necessary for sustaining life.
- 4.5 The compilation of social and economic data, the first such compilation for the North Atlantic area, is contained in Annex 3. The Group recognised that there was a need to avoid an excessive burden of reporting but agreed that in order to be able to assess changes in the social and economic data it believes that the information in the 'wish list' should be kept current by each country and reviewed by NASCO on a five year cycle.

**5. Approaches used and results from any new studies to estimate different types of social and economic value and impacts:**

- 5.1 A table providing an overview of existing information on the social and economic values of Atlantic salmon together with a bibliography of studies that had been developed at the first Workshop and updated in 2004 was further updated by the Group, WGSE(08)16 (Annex 4).
- 5.2 The Group recognized that various methods have been used to estimate economic impacts. The lack of consistency in the methods used in the various studies of economic impacts of Atlantic salmon makes comparisons among studies difficult. With respect to cost benefit analyses there is a similar variation in the methods used and some studies have estimated use values while others have estimated use and existence values. The values derived from these cost benefit studies are potentially additive, but only with care. The Group considers that an exercise should be undertaken to audit the methods used with a view to developing guidelines on how the results of particular studies might be deployed to inform salmon management. The bibliography contained in document WGSE(08)16 referred to above should be expanded into an annotated bibliography, which would give further guidance on the extent to which the estimates from studies may be added to inform on Atlantic wide issues.
- 5.3 The Group noted that under its TORs it is requested to consider the social and economic values of the environmental aspects of the salmon. The Group reviewed a table developed by Ireland which showed the number of rivers affected by various environmental impacts such as hydro-electricity generation, water abstraction etc. The Group was advised that in England and Wales economic values can already be assigned to a number of environmental impacts. The Group felt that the development of such a summary table providing details of the number of rivers affected by various impacts and where possible the economic cost of those impacts could be a valuable initiative for further consideration by the Group.

**6. Identification of data and information needs and deficiencies and approaches to address them**

- 6.1 The Group recognised that the information contained in Annex 3 is extremely informative. There is, however, a need to consider separately cost benefit analyses and estimates of economic impacts. The Group, therefore, developed matrices summarising the information presented under the headings of 'Participation', 'Cost-benefit Analyses' and 'Economic Impacts'. These matrices are contained in Tables 1-3. The Group stressed that the information presented in these tables is purely a summary to illustrate the available information and data deficiencies and for a number of reasons should not be interpreted in any other way. While the Group had not summarised the information on the legal basis for fisheries in the various countries it recognised that there are very different legal regimes around the North Atlantic with different permitted gear types, private and publicly owned fisheries, open access and restricted access public fisheries, and different fishing seasons. More detailed information on the legal basis for the fisheries is contained in Annex 3 and the Parties' Implementation Plans.

6.2 The Group noted that at the first Technical Workshop in 2003 (see document CNL(03)18) an outline of the analytical methods that can be used to estimate the various economic values and impacts of wild salmon and the data needed had been developed. The Group believes that review of the information in Tables 1 - 3 should assist identification of gaps in the available social and economic information and that the methods and data needs identified in CNL(03)18 might be used by individual jurisdictions to address these gaps as resources permit.

6.3 The Group recognised that in 2005 the Council of NASCO had adopted 'Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach', CNL(04)57, but that because of the changes to the annual reporting on NASCO's agreements, as a consequence of the 'Next Steps' for NASCO review process there had been little exchange of information on experience in using the guidelines to date. However, the Group was aware that the guidelines were being used in some jurisdictions and noted that under the focus area reporting on Implementation Plans the Parties are requested to report on how social and economic factors have been incorporated in management decisions. The Group welcomed this development and noted that both the case study approach and bio-economic modeling depend on the availability of specific types of data.

## **7. Developing and improving the integration of social and economic factors into management decisions, including the proposed future development of a bio-economic model**

7.1 A bio-economic modeling approach that would allow social and economic factors to be integrated into a theoretical management model for Atlantic salmon was outlined by the US, WGSE(08)12. Since the second technical Workshop in 2004 the model had been adapted for use with recreational fisheries. It was recognized that this model was not predictive because of the lack of information on future trends in stock status. It does, however, provide a qualitative method for evaluating potential management actions to help inform decision making. The Group welcomed this approach. Dr Ward indicated that the next step would be to apply the model to a particular fishery and in this regard would hope to cooperate with the participants from Scotland or Norway. Mr Alan Radford agreed to liaise with Dr Ward with a view to obtaining input data for the model from Scotland in association with the Scottish Government. The results of the trial run of the model will be reported to the Group.

7.2 The Group recognised that there is scope for economic information to be misused even after separating the cost-benefit and economic impact information as it has done in Tables 2 and 3. Therefore, the Group intends to develop guidelines to assist NASCO and its Parties in interpreting social and economic information.

## **8 Conclusions and recommendations**

8.1 The TORs allow for more than one meeting of the Working Group and this is therefore only an interim report.

8.2 It is not the intention that this Working Group would carry out socio-economic analyses for the Parties. It is for them to decide taking into account their own situation

and resources. Rather, the Group sees NASCO's role as an international forum for cooperation, leading to cost-effective exchange of information and experience and for developing guidelines and promoting best practice.

- 8.3 The Group believes that the collection, analysis and integration of socio-economic information to aid salmon management is far behind the collection, analysis and integration of biological information (the Group is aware, for example, that the ICES Working Group on North Atlantic Salmon Group meets annually for about ten days). It is not suggested that this practice be followed by this Group but it is recognised that there remains a need to focus on the social and economic aspects.
- 8.4 The Group has made a first attempt to construct a 'wish list' of social and economic information to support management (Annex 3).
- 8.5 The Group has started to collate the available information to populate this list and, so far, nine countries have contributed. The Group urges the Council to request that the other countries contribute available information to this important new data resource. The Group has also made a first attempt to summarise some of this information in a series of tables (see Tables 1 -3). The Group has some concern that the data in these summary tables **may be misinterpreted and stresses that they are simply summaries** to aid in reviewing the large volume of information presented. In this regard, the Group has agreed to develop guidelines to assist with the interpretation of social and economic data (see paragraph 7.2). The Group also updated a summary of studies and a bibliography concerning social and economic values (see document WGSE(08)16, Annex 4).
- 8.6 It is recognised that there are costs associated with the collection and analysis of social and economic information just as there are in collecting the biological data but that is, again, a matter for the individual Parties to decide. However, there are many benefits from having this information and the Group urges the Parties to fill these gaps in our knowledge.
- 8.7 There are many threats to the wild stocks and those supporting and advocating salmon conservation and restoration will need all the factual information they can get to support their case. In this regard, the Group is impressed with the preliminary indications of the significance of the existence value of wild salmon. If the little information that we have on this aspect of value applies broadly, the existence value of wild salmon for some Parties will add enormously to the total value of the resource. The Group does not believe that this value has been fully recognised. The Group has not made any progress in describing the social, ceremonial, cultural and food values of salmon to dependent communities. These aspects are hard to quantify. Some noted that there may be a need to express these values in narrative rather than in monetary terms.
- 8.8 The Group reviewed a bio-economic model. Such models could be valuable in the future and the model will be tested using Scottish and/or Norwegian data and expertise.

- 8.9 In order to contribute a socio-economic element for the ‘State of Salmon’ report which the Council of NASCO is developing, the Group asked a small group of experts (John Ward, Gudni Gudbergsson, Oystein Aas, Alan Radford, Guy Mawle) to work by correspondence. The Secretariat would be asked to contact the other countries to ask if they would be willing to provide a contact person to assist the Group with points of clarification and additional data.
- 8.10 In short, the Group has compiled the first international collation of available social and economic information on the wild salmon. It now aims to complete this and deliver to NASCO and its Parties the social and economic data and approaches to allow the wild Atlantic salmon to be assessed at its rightful social, economic, cultural levels.
- 9. Any other business**
- 9.1 There was no other business.
- 10. Date and place of next meeting**
- 10.1 The Group noted that its Terms of Reference allowed for the possibility of more than one meeting. However, the Group decided that it would not be possible to meet again prior to the 2008 Annual Meeting of NASCO and agreed that it should aim to meet again before March 2009. However, some of the work listed above will be progressed inter-sessionally by correspondence.
- 11. Report of the meeting**
- 11.1 The Group agreed a report of its meeting.

**Table 1: Summary information on participation in salmon related activities**

| Jurisdiction                | Recreational  |   | Commercial   |                                 | Food, social and ceremonial  | Non-consumptive  | Subsistence   |
|-----------------------------|---|---|--|---------------------------------|--|--|---|
|                             | Number of anglers/value                               | Number of fish caught/weight  | Number of fishermen/value                          | Number of fish caught/weight    |  |  |   |
| Canada                      | 41.7k<br>CAN\$58.4m                                   | 54.8k retained<br>45.8k released  | NR - closed  | NR - closed                     | Catch 44 - 63 tonnes<br>Number of First Nation fishers varies with land claims, agreements and licence regimes | ID   | ID  |
| Denmark - Greenland         | ID  | ID  | ID   | ID                              | See subsistence  | ID   | Catch 20-25 tones. In 2007 there were 261 license holders |
| Denmark - Faroe Islands     |   |   |  |                                 |  |  |   |
| EU - Denmark                |   |   |  |                                 |  |  |   |
| EU - Finland                |   |   |  |                                 |  |  |   |
| EU - France                 |   |   |  |                                 |  |  |   |
| EU - Germany                |   |   |  |                                 |  |  |   |
| EU - Ireland                | 30k<br>Euro11m  | 30.8k (45% released)  | 450<br>Euro700k (first value) + Euro450k (smoking) | 9k<br>27 tonnes                 | ID   | ID   | ID  |
| EU - Spain                  |   |   |  |                                 |  |  |   |
| EU - Sweden                 |   |   |  |                                 |  |  |   |
| EU - UK (England and Wales) | 23K<br>£125m  | 20k (55% released)<br>80 tonnes<br>135k days fished, average 8 days per fish caught | 945<br>£0.5m                                       | 13.5k<br>50.5 tonnes            | ID   | NR   | ID  |
| EU - UK (Northern Ireland)  |   |   |  |                                 |  |  |   |
| EU - UK (Scotland)          | 467k angler days<br>£61.6m                            | 38.4k retained, 117 tonnes<br>47.4k released, 156 tonnes                            | 503<br>£1.1m                                       | 24.9k<br>72.9 tonnes            | ID   | NR   | ID  |
| Iceland                     | ID<br>Euro111m<br>70,000 local anglers not all salmon | 36.8k retained<br>8.7k released   | ID<br>Euro110k                                     | 5.9k<br>16.5 tonnes             | ID   | NR   | ID  |
| Norway                      | 100k<br>Euro114m                                      | 225k fish<br>499 tonnes   | 1400<br>Euro3.5m                                   | 128k (20% farmed)<br>512 tonnes | see Subsistence  | 75k visitors/Euro0.75m + several other visitor sites + festivals | ID  |
| Russian Federation          | 15.5k<br>NR   | NR  | 294<br>NR  | NR                              | ID   | NR   | NR  |
| USA                         | NR  | NR  | ID   | ID                              | ID   | ID   | ID  |

**Note:** The information presented in Summary Tables 1 - 3 should not be summed unless the information is converted to common currencies and common years. Even then the information may not be additive. The summary information should be considered together with the more detailed information presented in Annex 3 of this report.

Canada expects to be able to provide additional socio-economic information on the salmon fisheries at NASCO's 2008 Annual Meeting.

**Key:** NR = not relevant; ID = information deficient

Table 2: Summary information on costs and benefits of Atlantic salmon

| Jurisdiction                | Recreational | Commercial  | Food, social and ceremonial | Non-consumptive | Subsistence | Existence value |
|-----------------------------|--------------|-------------|-----------------------------|-----------------|-------------|-----------------|
| Canada                      | CAN\$58.4m   | NR - closed | NR                          | ID              | ID          | ID              |
| Denmark - Greenland         | NR           | NR          | NR                          | NR              | ID          | NR              |
| Denmark - Faroe Islands     |              |             |                             |                 |             |                 |
| EU - Denmark                |              |             |                             |                 |             |                 |
| EU - Finland                |              |             |                             |                 |             |                 |
| EU - France                 |              |             |                             |                 |             |                 |
| EU - Germany                |              |             |                             |                 |             |                 |
| EU - Ireland                | Euro11m      | ID          | NR                          | NR              | ID          | ID              |
| EU - Spain                  |              |             |                             |                 |             |                 |
| EU - Sweden                 |              |             |                             |                 |             |                 |
| EU - UK (England and Wales) | £125 m       | £0.5m       | ID                          | ID              | ID          | £350m           |
| EU - UK (Northern Ireland)  |              |             |                             |                 |             |                 |
| EU - UK (Scotland)          | £511.05m     | ID          | NR                          | ID              | NR          | ID              |
| Iceland                     | Euro111m     | Euro110m    | NR                          | ID              | NR          | ID              |
| Norway                      | ID           | ID          | ID                          | ID              | ID          | ID              |
| Russian Federation          |              |             |                             |                 |             |                 |
| USA                         |              |             |                             |                 |             |                 |

**Note:** The information presented in Summary Tables 1 - 3 should not be summed unless the information is converted to common currencies and common years. Even then the information may not be additive. The summary information should be considered together with the more detailed information presented in Annex 3 of this report. Canada expects to be able to provide additional socio-economic information on the salmon fisheries at NASCO's 2008 Annual meeting

**Key:** NR = not relevant; ID = information deficient

**Table 3: Summary information on the economic impact of Atlantic salmon**

| <b>Jurisdiction</b>         | <b>Recreational</b>  | <b>Commercial</b>                | <b>Food, social and ceremonial</b> | <b>Non-consumptive</b> | <b>Subsistence</b> | <b>Existence value</b> |
|-----------------------------|--|----------------------------------|------------------------------------|------------------------|--------------------|------------------------|
| Canada                      | Expenditure CAN\$58.4m   | NR - closed                      | NR                                 | ID                     | ID                 | NR                     |
| Denmark - Greenland         | NR   | NR                               | See subsistence                    | NR                     | ID                 | NR                     |
| Denmark - Faroe Islands     |  |                                  |                                    |                        |                    | NR                     |
| EU - Denmark                |  |                                  |                                    |                        |                    | NR                     |
| EU - Finland                |  |                                  |                                    |                        |                    | NR                     |
| EU - France                 |  |                                  |                                    |                        |                    | NR                     |
| EU - Germany                |  |                                  |                                    |                        |                    | NR                     |
| EU - Ireland                | Net contribution (2002) after displacement Euro11m   | 70 FTEs draft nets               | NR                                 | NR                     | NR                 | NR                     |
| EU - Spain                  |  |                                  |                                    |                        |                    | NR                     |
| EU - Sweden                 |  |                                  |                                    |                        |                    | NR                     |
| EU - UK (England and Wales) | Expenditure 36.9 million, income £29m, 1200 FTE's supported, 450 net loss. Various ratios available. Estimates available for regions | ID                               | NR                                 | ID                     | NR                 | NR                     |
| EU - UK (Northern Ireland)  |  |                                  |                                    |                        |                    | NR                     |
| EU - UK (Scotland)          | Expenditure £61.65m, expenditure loss £44.8m, household income loss £34.5m, employment loss 1966 FTEs                                | Market value of the catch £1.1 m | NR                                 | ID                     | NR                 | NR                     |
| Iceland                     | Data on distribution of angler expenditure. Expenditure loss of ISK 2-3billion with closure, 1200 jobs (not FTE,s) supported,        | Value of catch ISK 9.9 m         | NR                                 | ID                     | NR                 | NR                     |
| Norway                      | Expenditure Euro160m, 2,900 FTEs supported<br>Net impact Euro66m   | Euro3.0m<br>150 FTE's            | ID                                 | ID                     | ID                 | NR                     |
| Russian Federation          | 119 full time direct jobbs and 264 part time direct jobs   | ID                               | ID                                 | ID                     | ID                 | NR                     |
| USA                         |  |                                  |                                    |                        |                    | NR                     |

**Note:** The information presented in Summary Tables 1 - 3 should not be summed unless the information is converted to common currencies and common years. Even then the information may not be additive. The summary information should be considered together with the more detailed information presented in Annex 3 of this report.

Canada expects to be able to provide additional socio-economic information on the salmon fisheries at NASCO's 2008 Annual Meeting.

**Key:** NR = not relevant; ID = information deficient



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**WGSE(08)17**

***Agenda***

1. Opening of the Meeting
2. Adoption of the Agenda
3. Consideration of the Terms of Reference and Working Methods
4. Presentation of basic key data and information necessary to describe the social and economic aspects of wild salmon
5. Approaches used and results from any new studies to estimate different types of social and economic values and impacts:
  - (a) commercial and subsistence salmon fisheries
  - (b) recreational salmon fisheries
  - (c) non-consumptive values
  - (d) the existence of salmon
  - (e) social, ceremonial and cultural aspects
  - (f) environmental aspects, with particular reference to biodiversity value
6. Identification of data and information needs and deficiencies and approaches to address them
7. Developing and improving the integration of social and economic factors into management decisions, including the proposed future development of a bio-economic model
8. Conclusions and Recommendations
9. Any other business
10. Date and place of next meeting
11. Report of the meeting

**WGSE(08)20**

***Listing of Socio-Economic Information***

Prior to the meeting of the Working Group Norway had developed a format for providing socio-economic information. This format was amended at the meeting and each jurisdiction was given the opportunity to provide the information according to the revised format. In the revised format, information on subsistence fisheries is included under the section for 'Food, Social, Ceremonial, Cultural Aspects' rather than under 'Commercial Fisheries'. Where this information was submitted using the revised format it has been included in that format. Otherwise the information is in the format originally submitted to the Working Group. Some information has been provided by Canada but in a different format. This is also included. Canada has advised that it hopes to make additional information available at the Twenty-Fifth Annual Meeting. Compilation of this information is an on-going project and the Working Group hope that information will be made available for those jurisdictions that have not yet provided it.

## Denmark (in respect of Faroe Islands and Greenland)

### Greenland

| Commercial salmon fisheries (including heritage fisheries)  |  |
|---|--|
| Identification of Stakeholders  | The Greenlandic salmon fisheries cannot be described as commercial – see “Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries”. |
| Fishing right holders   |  |
| Fishermen other than fishing right holders  |  |
| Commercial fishing related industries   |  |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) |  |
| Number of fishermen including trends  |  |
| Demographic characteristics of fishermen: e.g. age, gender  |  |
| Catch, CPUE, (mean annual reported catch)   |  |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon)           |  |
| Type(s) of gear in use, number of gear  |  |
| Costs associated with the activity  |  |
| Motivations for fishing ...(important for combined types of fishing)  |  |
| Profitability   |  |

| <b>Recreational salmon fisheries</b>   |   |
|--|---|
| Identification of main stakeholders  | The Greenlandic salmon fishery cannot be described as recreational although ‘recreational’ fishery is a possibility – see “Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries”. |
| Fishing right holders  |   |
| Fishermen  |   |
| Sport fishing related industries   |   |
| Guiding  |   |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   |   |
| Sport fishing equipment producers and retailers  |   |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) |   |
| Number of rivers   |   |
| Number of fishermen  |   |
| Number of fishing days   |   |
| Demographic characteristics: e.g. age, gender  |   |
| Catch, CPUE, mean annual reported catch  |   |
| Market value (e.g. of catch, including trends, fishing rights)   |   |
| Gear in use, preferences of gear   |   |
| Types of fishing licensing – prices, indicators  |   |
| Costs connected with the activities  |   |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)   |   |
| Motivation   |   |
| Magnitude of and attitude towards Catch & Release  |   |
| Number of businesses/number of jobs created by /depending on a salmon fishery  |   |

| <b>NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity</b>  |   |
|--|---|
| Description of non-consumptive uses  | N/A   |
| Demographic characteristics: e.g. age, gender of users   | N/A   |
| Costs connected with the activities  | N/A   |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)                       | N/A   |
| Motivation   | N/A   |
| Number of businesses/number of jobs created/depending these activities                                     | N/A   |
| <b>Existence of salmon</b>   |   |
| Main stakeholders  | N/A   |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | N/A   |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | N/A   |
| <b>Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries</b>                                |   |
| Main stakeholders  | <p>Greenland does not have its own home-water stock, and therefore it is the mixed stock made up of both North American and European stocks that contributes to this fishery.</p> <p>Salmon fisheries in Greenland can be broken down into:</p> <ul style="list-style-type: none"> <li>• subsistence fisheries for sale in open air markets or to hotels, institutions, etc.</li> <li>• subsistence fisheries for personal consumption</li> <li>• sport and leisure fisheries</li> </ul> <p>Open market sale fishery requires a licence. Licences are issued by the Department of Fisheries, Hunting and Agriculture to applicants who meet</p> |

|   |   |
|---|---|
|   | <p>the following requirements:</p> <ul style="list-style-type: none"> <li>• They must have a permanent affiliation with Greenland.</li> <li>• They must own their own salmon nets and a vessel suitable for salmon fishing of length not exceeding 12.8 metres (42 feet).</li> <li>• They must, together with the application, submit information on the number and type of salmon nets they have.</li> </ul> <p>Recreational salmon fisheries do not require a licence but all catches have to be reported. Recreational salmon fishery is allowed to those who have:</p> <ul style="list-style-type: none"> <li>• Danish citizenship and are domiciled in Greenland.</li> <li>• Or for those who does not hold a Danish citizenship but have been domiciled in Greenland for at least two continuous year.</li> </ul> <p>In 2005 there were 185 license holders and the catch was estimated at 15,304 kilo.<br/> In 2006 there were 165 license holders and the catch was estimated at 23,016 kilo.<br/> In 2007 there were 261 license holders and the catch was estimated at 24,646 kilo.</p> |
| Indigenous people (Sami people, first nations...) |   |
| People carrying out historic fishing activities   | Greenland has temporarily agreed to not setting a quota although entitled to do so. Instead Greenland   |



|  |  |
|--|--|
|  | allows subsistence fisheries, which are considered necessary for the food supply of the Greenlandic population, especially the part of the population living in small settlements on the coast. This fishery is important for upholding a varied food supply and is considered an essential supplement for the low-income groups in Greenland. Self-sufficiency from natural resources is an integrated part of Greenlandic culture and has through generations been considered necessary for sustaining life. |
|--|--|

| Environmental aspects with particular reference to biodiversity value  |     |
|--|-----|
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | N/A |
| Genetic reserve for aquaculture  | N/A |
| Genetic reserve for the survival of the species under changing (climate) conditions  | N/A |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | N/A |

## European Union

### EU-Ireland

| Commercial salmon fisheries (including heritage fisheries) and subsistence fisheries  |   |
|---|---|
| Identification of Stakeholders  |   |
| Fishing right holders   | Prior to 2007, there were 1,535 commercial fishing licences available. This number was capped by the Minister for the Marine in 1996. In 2007 a hardship scheme was introduced for commercial fishermen. Approx 1,100 licence holders have availed of the hardship scheme. Post 2007 the number of commercial licences was specified in the Control of Fishing for Salmon Orders 2007 (Nos 129 and 154 and limited the number of licences to approx 200)  |
| Fishermen other than fishing right holders  | Only licensed fishermen can commercially fish for salmon. There may be three crew members involved  |
| Commercial fishing related industries   | Twelve companies smoking wild salmon. The scale of the wild smoked salmon industry has greatly reduced since the cessation of drift net fishing in 2007   |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) | <p>It is the Irish Government's strongly held view that our salmon stock is a national asset, which must be conserved and protected, as well as being exploited as a resource, by all on a sustainable and shared basis. As a result, a delicate balancing exercise is necessary between the needs of the coastal and inland communities who depend on fishing resources for their livelihood and the recreational users, including tourists, who each pursue the salmon for their own end. The Irish Government believes that this fundamental principle is in keeping with overall European Union policy regarding the development of rural areas as well as the key principle of the Habitats Directive 92/43/EEC, which is that sustainable use of the resource, including exploitation, should be achieved.</p> <p>The Minister, in exercise of the powers conferred by the Fisheries Acts and in compliance with the requirements of Regulation 31 of the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), makes appropriate regulations governing the fishery.</p> <p>The number of commercial licences issued is regulated by the Minister for Communication, Energy and Natural Resources. The Control of Fishing for Salmon Order (2007 S.I. No. 129) authorises the</p> |

|  |  |
|--|--|
|  | <p>issue of commercial fishing licences by regional fisheries boards and sets out the criteria under which those licences may be issued and prescribes the maximum number of commercial licences which may be issued by regional boards. The Order also provides for the allocation of licences that may become available in 2007 because a person who would be eligible to be awarded a licence accepts an offer from the hardship fund.</p> <p>Wild Salmon and Sea Trout Tagging Scheme Regulations 2007 S.I. No. 849 of 2007 provide, among other things, the quotas of fish that can be harvested by commercial fishing engines and rod and line from those rivers which are identified in the regulations as having a surplus above the conservation limit.</p> <p>Conservation of Salmon and Sea Trout Bye-law No. 822, 2007 prohibits drift Net, Snap Net and Other Engine fishing for salmon and trout (salmon includes sea trout as defined in the Fisheries Consolidation Act 1959) in all fishery districts. The Bye Law also prohibits having on board a boat or vehicle these nets with the intention of fishing for salmon or trout.</p> <p>The legislation is held under constant review and the Minister receives advice from the National Salmon Commission and the National Fisheries Management Executive on proposals for changes.</p> |
| Number of fishermen including trends                       | <p>As a result of the introduction of the salmon hardship scheme in 2007, the number of commercial fishermen licence holders has fallen from 1,535 to approximately 200 (see above). These remaining licences can only operate in estuaries / rivers where there is an identified exploitable salmon surplus above spawning requirements. For 2007, 158 commercial licences were fished.</p> <p>The Minister for Communications, Energy and Natural Resources has requested development of an equitable mechanism for the allocation of surplus between the commercial and recreational fisheries.</p>   |
| Demographic characteristics of fishermen: e.g. age, gender | <p>Almost exclusively male. A 2003 study indicated that 43% of commercial salmon fishermen were in the 35-54 year age category and 27% over 55 years.</p>  |
| Catch, CPUE, (mean annual reported catch)                  | <p>The annual commercial salmon catch has been regulated by quota since 2002. The commercial quota has been progressively reduced since 2002.</p> <p>2002 commercial catch - 206,899 salmon</p>  |

|   |  |
|---|--|
|   | <p>2003 commercial catch – 183,478 salmon<br/> 2004 commercial catch – 143,606 salmon<br/> 2005 commercial catch – 121,180 salmon<br/> 2006 commercial catch – 86,176 salmon<br/> 2007 Estimated commercial catch – 9,013</p> <p>The Minister for Communications, Energy and Natural Resources has requested development of an equitable mechanism for the allocation of surplus between the commercial and recreational fisheries.</p>  |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon) | <p>The first sale price for wild salmon in 2007 was €25 / kg compared to €5 / kg for farmed salmon. Organic farmed salmon prices are higher than other farmed salmon prices. An estimated commercial salmon catch of 9,000 salmon in 2007 gives a gross first sale value of €675,000.</p> <p>A hardship fund was established by Government comprising a Salmon hardship scheme and associated community support scheme. The value of the hardship fund was €25 M with a further €5m for community support schemes.</p> |
| Type(s) of gear in use, number of gear  | 158 draft net licences were issued in 2007. No drift net or other licences were issued   |
| Costs associated with the activity  | Commercial fishermen have costs for the annual commercial fishing licence, boat fuel, nets and crew wages. Repair of boats or purchase of new boats is also an added cost.   |
| Motivations for fishing ...(important for combined types of fishing)  | Commercial salmon fishermen are inshore fishermen who fish for salmon during the months of June and July. Data show that for salmon fishermen 42% of time was spent on salmon fishing, 12.7% on other fishing, and 7.8% on farm work. Furthermore, 14.6% of time was spent on other employment, and 7.4% in unemployment. Salmon has traditionally been an important seasonal source of income for inshore fishermen.  |

| Recreational salmon fisheries       |  |
|-------------------------------------|--|
| Identification of main stakeholders |  |
| Fishing right holders               | Recreational salmon fisheries are both private and State owned. Rod fishing rights on many rivers in the west are privately owned and rates are paid to the Fisheries Board annually. On larger rivers, sections of the fishing rights may be privately owned and other sections owned by the State. The Electricity Supply Board hold the fishing rights on the four major rivers |

|  |  |
|--|--|
|  | impounded for hydro-electricity.   |
| Fishermen  | There were 31,000 salmon rod licences taken out annually over the 2001-2006 period. Approx 59% are Irish, 15% from Northern Ireland, and 6% from the UK. Just under 20,000 licenses were issued in 2007 [see below]  |
| Sport fishing related industries   |  |
| Guiding  | Salmon angling guides, hotels, B&B's,  |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   | Most salmon angling takes place in rural areas where added value from salmon angling is important  |
| Sport fishing equipment producers and retailers  | Salmon angling contributes to local fishing tackle shops, wholesalers etc but no estimate of expenditure are available   |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | <p>The Minister, in exercise of the powers conferred by the Fisheries Acts and in compliance with the requirements of Regulation 31 of the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), makes appropriate regulations governing the fishery.</p> <p>These are just some of the instruments in force. A comprehensive list is available at <a href="http://www.wildsalmon.ie">www.wildsalmon.ie</a>. Wild Salmon and Sea Trout Tagging Scheme Regulations 2007 S.I. No. 849 of 2007 provide, among other things, the quotas of fish that can be harvested by commercial fishing engines and rod and line from those rivers which are identified in the regulations as having a surplus above the conservation limit.</p> <p>Salmon Rod Ordinary Licences (Alteration of Licence Duties) Order 2007, S.I. No. 794 of 2007. This Order prescribes the licence fees payable from 1 January 2008 in respect of salmon rod ordinary fishing licences and the Foyle Area extension licence including a salmon conservation component equivalent to 50% of the licence fee. The proceeds of this will be invested in wild salmon management initiatives designed to rehabilitate wild salmon stocks and habitats.</p> <p>Conservation of Salmon and Sea Trout Bye-Law No. 829 of 2007 provides for an annual bag limit of 10 fish in rivers identified as being above their conservation limits for the 2008 season and a season bag limit of 3 fish in the period 1 Jan to 11 May, a daily bag limit of 3 fish from 12 May to 31 August and a daily bag limit of 1 fish from 1 September to the end of the season. The Bye-law also provides for the use of single hooks and prohibits the use of worms as bait once the</p> |

|                     | <p>specified number of fish have been caught in the specified periods.</p> <p>Conservation of Salmon and Sea Trout Bye-Law No. 830 of 2007 provides for catch and release in respect of salmon and sea trout (over 40 cm) in specified rivers and associated conditions.</p> <p>Conservation of Salmon and Sea Trout Bye-Law No. C.S. 293, 2007 prohibits angling for salmon and sea trout (over 40 cm) in specified rivers that are not meeting their conservation limits.</p>  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
|---------------------|--|--------------|-----------------------|--------------|-------|-----------------|-------|----------|-------|----------------|-------|---------------|-------|-----------------|-----|--------------------|-----|-------|--------|
| Number of rivers    | <p>In Ireland, there are 148 designated salmon rivers.</p> <p>Approximately 70 are small rivers with an annual rod catch less than ten salmon annually but are important from a bio-diversity perspective.</p> <p>About 45 rivers can be described as important rod angling salmon fisheries with an annual average rod catch exceeding 100 salmon while a further 20 record a rod catch exceeding 50 salmon annually.</p> <p>In 2007, of the total number of salmon rivers in Ireland (148), 41 rivers were open for taking salmon. A further six rivers were open for catch &amp; release.</p> |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Number of fishermen | <p>There were 19,879 salmon rod licences issued in 2007.</p> <table border="1"> <thead> <tr> <th>Licence Type</th><th>Number issued in 2007</th></tr> </thead> <tbody> <tr> <td>All District</td><td>2,559</td></tr> <tr> <td>Single District</td><td>7,786</td></tr> <tr> <td>Juvenile</td><td>1,127</td></tr> <tr> <td>21 day licence</td><td>5,892</td></tr> <tr> <td>1 Day licence</td><td>2,044</td></tr> <tr> <td>Foyle Extension</td><td>365</td></tr> <tr> <td>Local Area Licence</td><td>106</td></tr> <tr> <td>Total</td><td>19,879</td></tr> </tbody> </table>                        | Licence Type | Number issued in 2007 | All District | 2,559 | Single District | 7,786 | Juvenile | 1,127 | 21 day licence | 5,892 | 1 Day licence | 2,044 | Foyle Extension | 365 | Local Area Licence | 106 | Total | 19,879 |
| Licence Type        | Number issued in 2007  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| All District        | 2,559  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Single District     | 7,786  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Juvenile            | 1,127  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| 21 day licence      | 5,892  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| 1 Day licence       | 2,044  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Foyle Extension     | 365  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Local Area Licence  | 106  |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |
| Total               | 19,879   |              |                       |              |       |                 |       |          |       |                |       |               |       |                 |     |                    |     |       |        |

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|  | Prior to rivers being closed on conservation grounds in 2007, the average number of salmon rod licences taken out over the 2001-2006 period was 31,088.   |
| Number of fishing days   | It is not possible to determine the number of fishing days from salmon rod licence logbooks as anglers generally do not record days when no salmon were captured.   |
| Demographic characteristics: e.g. age, gender                  | <p><i>The INDECON report (2003) reported on the breakdown of overseas salmon anglers by age. The data indicates that almost one-half of visitors were between 35 and 54 years of age. In fact, overseas salmon anglers tend to be slightly older on average than overseas holidaymakers as a whole.</i></p> <p><i>Data was also presented on overseas salmon anglers according to social class. Overall, 45% of visitors were in the managerial/professional (AB) social class, 38% were white collar (C1) workers, 13% were skilled workers (C2), while 5% were unskilled workers (5%).</i></p> <p>No current data is available for domestic salmon anglers.</p> |
| Catch, CPUE, mean annual reported catch                        | <p>Since the introduction of the tagging and logbook scheme in 2001, anglers are obliged to tag rod caught salmon. The total reported number of salmon caught by rod and line and tagged in 2007 is estimated at 30,826 fish. A raising factor is applied to this number to account for anglers not returning logbooks. The previous 5 year average (2002-2006) was 24,268 rod caught salmon.</p> <p>In 2007, of the total number of salmon rivers in Ireland (148), 41 rivers were open for taking salmon in 2007. A further six rivers were open for catch &amp; release.</p>   |
| Market value (e.g. of catch, including trends, fishing rights) | <p>Salmon angling has been estimated (Indecon Report, 2003) to generate €11 per annum. The Report of the Independent Group (2006) concluded that the 2003 <i>Indecon</i> analysis presents an absolutely minimal estimate of the value of salmon angling and that the real value is a multiple of the estimates given. The contribution of overseas anglers to the Irish economy could be as high as €38 million while a domestic angler total value of €51 million could be derived.</p> <p>Since 2001, salmon and sea trout &gt; 40cm caught by rod and line are prohibited to be sold.</p>   |
| Gear in use, preferences of gear                               | For salmon caught and retained over the 2006 & 2007 season, 38% were taken on fly, 29% on spinner, 25% on worm and 7% on prawn/shrimp.  |

|   |   |
|---|---|
|   | <p>For salmon caught and released, 55% were caught on fly, 29% on spinner, 10% on prawn and 5% on worm.</p> <p>There are angling regulations in place restricting the angling method on some rivers, .i.e. some rivers are fly only rivers. National regulations impose single barbless hooks and no worm fishing on rivers only open for catch and release.</p>  |
| Types of fishing licensing – prices, indicators | <p>There are a range of salmon licences available for salmon fishing;</p> <ul style="list-style-type: none"> <li>• Annual licence to fish all Fishery Districts, price; €134</li> <li>• District only licence (only permits fishing in one specific District) price; €64</li> <li>• 21 day all District licence, price; €50</li> <li>• Juvenile licence, price; €20</li> <li>• Special one day licence price €36</li> </ul> <p>A salmon conservation component was introduced for salmon rod licences in 2007. The conservation component was equal to the existing licence fee. The conservation component was introduced to implement a programme for rehabilitation of salmon stocks giving priority to rivers below their conservation limits in special areas of conservation which have the greatest prospect of recovery.</p> <p>Once an angler is in possession of a valid salmon fishing licence, a permit must be obtained to fish any particular stretch of water. Some salmon angling clubs operate an annual permit which can range from €50- €200 per season. Day permits on private salmon beats can cost from €75 - €200 per day.</p> |
| Costs connected with the activities             | <p>In a 2002 report (INDECON, 2003) overseas anglers were estimated to make an average of two trips to Ireland each year, spending an average of €406 per visit giving an annual gross spend of €10 million. To gain an idea of the net worth to the economy however <i>Indecon</i> discounted this figure by 40% to take account of the import component of that spend leaving a total value of overseas angling of €6 million. However a more recent report (Report of the Independent Salmon Group, 2006) concluded that this is likely to be a considerable underestimate and given that reported daily spends ranging from a low of €20 to a high of €3,000, an average spend as high as €2,642 per visit could be derived which would value their contribution to the Irish economy at</p>  |



|  |  |
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|  | <p>€38 million.</p> <p>Domestic anglers account for the bulk of the licences issued. <i>Indecon</i> found that these anglers made frequent (6) but short (2.5 days) trips. Their average daily spend was estimated at €136.50 giving a total value of €51 million. <i>Indecon</i> suggested that as much as 85% of this total would have been spent on alternative activities in Ireland were the anglers not salmon fishing. The resulting total was discounted by 40% giving a value of €4.6 million to the Irish economy. No evidence is provided for this presumption and given the fact that anglers tend to be very faithful to their sport, not participating in alternative activities to any great degree, this was questioned in the Report of the Independent Group (2006).. The Report of the Independent Group concluded that the 2002 <i>Indecon</i> analysis presents an absolutely minimal estimate of the value of salmon angling and that the real value is a multiple of the estimates given.</p> |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | No data is available on anglers willingness to pay. The closure of a large number of rivers to salmon angling since 2007 has had an impact of angling opportunities for some anglers. Introduction of the salmon conservation component in the licence fee may also have been a contributory factor to the one third reduction in licences issued in 2007. Conversely, the cessation of drift net fishing has resulted in increased runs of salmon to rivers. No recent studies are available on this subject  |
| Motivation   | There is no commercial motivation for salmon angling as there is a ban on the sale of rod caught salmon.   |
| Magnitude of and attitude towards Catch & Release                                    | <p>The practice of catch and release has been increasing in recent years and in 2006, anglers returned 22% of the salmon catch taken by rod and line, up from 12% in 2005 and 10% in 2004.</p> <p>In 2007, river specific quotas were in place on 41 rivers. Anglers could not harvest more than the number of salmon available in the angling quota for a specific river. This resulted in many salmon being caught and released. A further six rivers were open for catch and release only in 2007. In total, 13,893 salmon were estimated to be caught and released from a total provisional estimated rod catch of 30,826, giving a provisional catch and release estimate of 45.1% for 2007.</p> <p>With river specific angling quotas in place on rivers, daily and season bag limits in place for anglers and some rivers only open on a catch &amp; release basis, catch &amp; release will represent a significant proportion of the Irish salmon catch into the future.</p>                                |
| Number of businesses/number of jobs  | No current data available  |

|   |  |
|---|--|
| created by /depending on a salmon fishery |  |
|---|--|

| <b>NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity</b> |  |
|---|--|
| Description of non-consumptive uses   | <p>No formal salmon watching takes place. Irish and foreign tourists do watch salmon jumping at locations below falls or weirs, (Aasleagh falls on the R.Erriff, Galway salmon weir, Ballysodare falls, etc).</p> <p>A number of educational facilities are in place (Burrishoole Visitor Centre, River Eske Centre, Galway Fishery live camera, Waterville Development Association facility).</p> |
| Demographic characteristics: e.g. age, gender of users  | N/A  |
| Costs connected with the activities   | N/A  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)                      | N/A  |
| Motivation  | N/A  |
| Number of businesses/number of jobs created/depending these activities                                    | N/A  |

| <b>Existence of salmon</b>   |   |
|--|---|
| Main stakeholders  |   |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | <p>The importance of the salmon is mainly linked to commercial, recreational and cultural aspects rather than just the existence of salmon <i>per se</i>. However, this concept is unassessed and may be more important than known presently given the general public are aware of the importance of such issues as legacies for future generations etc</p> <p>Commitments arising from the designation of SACs for salmon under the habitats directive place a real onus on the conservation of stocks and imply investment in the protection and restoration where necessary.</p> |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | No survey has been carried out in this regard   |

| <b>Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries</b> |  |
|---|--|
| Main stakeholders   |  |
| Indigenous people (Sami people, first nations...)                           | Salmon and themes relating to salmon are prevalent in Irish folklore and mythology and are therefore an integral part of the social and cultural lives of the Irish people. There are few if any ceremonial aspects to Irish life relating to salmon apart from some specific festivals surrounding the start or high points of the salmon season e.g the Ballina salmon festival etc.   |
| People carrying out historic fishing activities                             | <p>Draft netting and other traditional inshore commercial fishing methods such as snap nets, loop nets, bag nets and head weirs have been fished for hundreds of years in Ireland.</p> <p>Snap netting is a traditional form of salmon fishing in the Southern region. No licences for snap nets were issued in 2007 to allow river stocks to recover and meet conservation limit. Loop nets were fished in Donegal while bag nets were fished in Cork and Kerry. Head weirs have been fished on the larger rivers like the Moy, Corrib and Boyne. Records of a head weir/ trap fishery for salmon exist since the thirteenth century on the River Corrib.</p> <p>While it is argued that the salmon fishery is a very important and irreplaceable part of the income of certain sectors for example the island communities' commercial fishery, continued indiscriminate harvest at sea and in river that do not meet their conservation limits has been discontinued on conservation grounds in compliance with the habitats directive and alternative hardship payments and assistance towards identifying alternative sources of income have been provided by the State.</p> |

| Environmental aspects with particular reference to biodiversity value  |   |
|--|---|
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | Salmon are perceived by the general public and stakeholders in Ireland to be representative of clean environments. The plight of the Atlantic salmon and current low population sizes are well publicised and there is an appreciation of the pressure the species is under from human influences including environmental and climate changes   |
| Genetic reserve for aquaculture  | Not an aspect considered generally  |
| Genetic reserve for the survival of the species under changing (climate) conditions  | Considered important by general public and stakeholders in terms of legacy issues and the responsibilities of this generation for safe-guarding the species into the future   |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | <p>Listing salmon as an Annex II species under the Habitats Directive has had major implications. In 2006, the Standing Scientific Committee provided the following advice to the National Salmon Commission,</p> <ul style="list-style-type: none"> <li>• The overall exploitation in most districts should be immediately reduced, so that Conservation Limits can be consistently met.</li> <li>• Furthermore, due to the different status of individual stocks within the stock complex, mixed stock fisheries present particular threats to the status of individual stocks.</li> <li>• Thus, the most precautionary way to meet national and <b>international objectives</b> is to operate fisheries on river stocks that are shown to be within precautionary limits i.e. those stocks which are exceeding their Conservation Limits.</li> <li>• Fisheries operated in estuaries and rivers are more likely to fulfil these requirements.</li> </ul> <p>The Irish Government committed to aligning with scientific advice in 2007 thus implementing NASCO and ICES recommendations and complying with the Habitats Directive. As a result of this decision, there was a cessation of mixed stock fishing around the Irish coast. Of the 148 salmon rivers, 43 rivers were open for harvesting salmon in 2007. The remaining rivers were closed to salmon exploitation to allow salmon stocks to recover.</p> |

## **EU-UK(England & Wales)**

### **1.0 Commercial salmon fisheries (including heritage fisheries) and subsistence fisheries**

#### **1.1 Identification of stakeholders**

##### **1.1.1 Fishing right holders:**

- No comprehensive list of fishery owners exists for either fresh or tidal waters.
- In practice, fishing with methods other than rod and line (covered in section 2) is now limited almost entirely to tidal waters.
- Except in a few places, there is a public right to fish in tidal waters though in practice this is constrained.

##### **1.1.2 Fishermen other than fishing right holders:**

- Everyone fishing for salmon in England and Wales must have a licence.
- In 2006, there were 337 licensees for salmon fishing with instruments other than rod and line (excluding the sea trout fisheries in Anglian region). In addition, there were 608 ‘endorsees’, authorised to assist licensees, totalling 945 people.
- All but about 20 licences relate to public fisheries.

##### **1.1.3 Commercial fishing related industries:**

- These would include fishmongers, fish smokers, hotels, and restaurants, but they have not been documented.
- Few would have wild salmon as a major component of their business.

##### **1.1.4 Legal basis for commercial fisheries, fishing regulations:**

- The number of licences issued is limited by law for almost all fisheries, whether public or private.
- The price of a licence for 2006 ranged from £67 to £1113, depending on the instruments licensed.
- Existing licensees usually have the right to retain a licence from year to year, provided that they are ‘dependent on fishing for their livelihood’, creating a pseudo-private fishery in public waters,.
- The areas of operation, methods, seasons and weekly times for fishing are constrained by byelaw.
- A fuller description of the fisheries and their allowable effort can be found in the Annual Assessment of Salmon Stocks and Fisheries, 2006, a preliminary assessment prepared for ICES by CEFAS & Environment Agency in April 2007 (Link 1 below).

##### **1.1.5 Number of fishermen:**

- The number of fishermen (licensees plus endorsees) has been falling steadily, from 2456 in 1985 to 935 in 2006.

#### 1.1.6 **Demographic characteristics:**

- These are not documented but most, if not all, are male and middle-aged or older.

#### 1.1.7 **Catch, CPUE (mean annual reported catch)**

- 13,578 salmon in 2006 with a weight of 50.5 tonnes
- The 5-year mean is 26, 427 salmon but fishing effort has been greatly reduced over this period, so is not a good indicator of the average catch that might currently be expected.

#### 1.1.8 **Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon)**

- **First sale** prices paid by fishmongers to netsmen: average rates for salmon range from £6.50/kg (Solway) and £10/kg (Severn estuary) to about £11/kg (North East coast) in 2007. A price of £10/kg for 50 tonnes gives a **gross first sale value** of the salmon net catch of £0.5 million for 2006. The price paid to netsmen has increased from about £4.80/kg in 1996 (adjusted to 2007 prices).
- Price of salmon at Billingsgate **fish market**, London (courtesy of the Fishmongers Company): Having declined in real terms from the late 1970s to the mid-1990s, following the price of farmed salmon, the price of wild salmon in August has since trebled to £17.50/kg in 2007. The price of farmed salmon was £3.25/kg and has changed little over the past decade. So the market will pay a substantial and increasing premium for wild salmon. While this is in part due to reduced supply, wild salmon is now widely considered as superior to farmed. Harrods in London is reported to now sell 90 percent wild salmon, compared to 50 percent ten years ago.
- Price of wild **smoked salmon** (from internet, 2008): from £45/kg (Severn & Wye Smokery) to £89/kg for a side (H. Forman, London). Smoking and marketing adds value, and again smoked wild salmon carries a high premium over farmed.
- **Buyouts**: where netsmen have accepted compensation to surrender their right to a licence, this might be a measure of their perception of the capitalised stream of their potential future nett benefits from the fishery. The buyout of 52 licensees of the North East coast drift nets indicates an approximate, average value of about £34/kg of salmon and sea trout relative to the size of the catch in 2002. Other factors than current catch are thought to have influenced individual netsmen's willingness-to-accept a buyout, including the future potential of the local fisheries for salmon and alternative species.

#### 1.1.9 **Types of gear in use, number of gear**

- These are described annually in the report to ICES for England & Wales, see section 1.1.4 above.
- Of the 327 salmon licences issued in 2006: 52 were for gillnets; 58 for sweep nets; 147 for hand-held nets; 65 for fixed engines; and 5 for both drift net and T-net.

## **1.2 Costs associated with the activity:**

- No assessment has been made of the licensed netmen's costs since 1996, when they were estimated as about £1 million (adjusted to 2007 prices).
- It is inappropriate to extrapolate from these because of major changes in fishing effort – there are only about half the number of licensees now, a substantially shorter season, and the balance of instruments is different.

## **1.3 Motivations for fishing:**

- While most netmen sell a large part or all of their catch, it is probable that for many the activity is not purely commercial.
- In past consultations over regulations, some netmen have indicated that they fish for enjoyment rather than profit. Notably, the Solway Haafnetters Association, about 96 licensees, have previously asked to be considered as recreational fishermen, like anglers. However, these netmen do sell large numbers of salmon and sea trout.
- Most fishermen use traditional fishing techniques, some going back hundreds of years and/or are a locally specific – for example: putchers, haaf, lave or coracle nets. For some, maintaining local traditions seems to be a significant motivation.

## **2.0 Recreational salmon fisheries**

### **2.1 Identification of stakeholders**

#### **2.1.1 Fishing right holders:**

- Almost all fishing rights for salmon in freshwater are privately held. Owners usually charge anglers for permission to fish.

#### **2.1.2 Fishermen:**

- In addition to having permission of the fishery owner, every salmon angler must have an Environment Agency rod licence.

#### **2.1.3 Sport fishing related industries:**

- Salmon angling contributes directly to a range of businesses though no descriptive statistics are available.

### **2.2 Legal basis for recreational fisheries:**

- On most rivers, especially where the fishing is owned or managed by clubs or fishing associations, access to fishing can be obtained for a fee. On some rivers, opportunities to fish are limited because the owners restrict access.
- No comprehensive list of fishery owners is maintained.

### **2.3 Number of rivers:**

- The Environment Agency reported salmon rod catches for 74 named rivers in England and Wales (including the Border Esk on the Scottish border) in 2006. In sixteen of these, the declared catch was less than ten salmon. The Tyne produced most, having a declared rod catch of 3,795 salmon.

#### **2.4 Number of salmon fishermen:**

- From almost 27k in 1994, when the current national licence structure was created, the number of annual licences declined to about 18k in 1999 before increasing again in recent years.
- In 2007, about 23k annual rod licences and 9k short-term rod licences were sold for salmon fishing. Some anglers may buy more than one short-term licence.
- In 2005, when about 34k salmon rod licences of all types were sold, about 26k people held rod licences to fish for salmon. Almost all were residents of England or Wales.

#### **2.5 Number of fishing days:**

- Anglers are required to declare the number of days fished for migratory salmonids each year.
- Over the past five years, about 180k days fishing for migratory salmonids, salmon and/or sea trout are declared on catch returns. In 2006, a follow-up survey indicated that about 25 per cent these were targeted at sea trout only so that about 135k of the declared days are fished for salmon.
- Actual totals will be higher than those declared. Though most licence holders make a catch return, not all declare their fishing effort as required.

#### **2.6 Demographic characteristics of anglers:**

- Over 95% of salmon rod licence holders are men, most of whom have been fishing for many years.
- A survey in 2001 indicated that they tend to be older than freshwater anglers in general: about 60% were over 45 years old.
- They come from all classes, but a higher proportion (about 25%) are in social classes A&B (professional and managerial) than anglers or the population in general.

#### **2.7 Catch, CPUE, mean annual reported catch**

- The declared rod catch in 2006 was just under 20k salmon, close to the 5-year mean, of which slightly more than half were released.
- The average weight was about 4kg, giving a total rod catch of about 80 tonnes.
- 61% were less than 3.6kg; 33% were >3.6-6.4 kg; 6% were >6.4kg
- On average, it took about 8 days fishing for salmon to catch one.

#### **2.8 Market value (e.g. of catch, including trends, fishing rights)**

- Although angling is generally considered a recreational activity and a ban on the sale of rod-caught salmon is imminent, some anglers currently sell their catch. As indicated in section 1.1.8, they might expect to obtain about £10/kg for a fresh-run salmon. So, on average, each fish caught might be sold for about £40. However, many fish are not fresh-run and would fetch a lower price.
- In their 1991 study, Radford and his colleagues surveyed fishery owners and estimated that, on average across England and Wales, owners considered that each salmon in the 5-year average rod catch ('per capita value') contributed about £9000 (at 2007 prices) to the value of their fishing rights.



- Since then, land agents have indicated that the market value of salmon fishing rights declined sharply. Though it has been rising again it has not reached the levels in the early 1990s. Judging from prices reported in the angling press, the current per capita value for salmon in England and Wales is probably between £5k and £8k.
- This market value might be taken as the average, capitalised value of the future stream of nett benefits per fish to the fishery owners. If each fish weighs on average 4 kg, that indicates a capitalised value of £1k to £2k per kg in the 5-year mean rod catch.
- The total value of salmon angling rights in England and Wales is in the order of £100-£150 million.

## 2.9 **Gear in use, preferences of gear:**

- Of the 2006 salmon rod catch, 43% were taken on spinner; 38% on fly; and 16% on bait.
- These proportions may not represent preferences as many rivers restrict the use of bait and/or spinner at certain times.

## 2.10 **Types of fishing licences:**

- An annual Environment Agency salmon rod licence cost £66.50 in 2007; with a half-price concession for disabled, senior (over 65) or junior (12-16) anglers. A one-day licence cost £7.
- Permits from fishery owners, where they are available, vary enormously in price. Day permits are generally from £15 to £60 reflecting the size and quality of the beat and the number of people fishing. On the Wye, a Visa rover permit offers access every day to a range of beats at £750 for the 2008 season. However, fishing for one day per week on some beats can exceed £1200 for the season. Permits on more crowded association waters are significantly cheaper, for example, £142 for the season at Llandysul on the Teifi.

## 2.11 **Costs connected with the activities:**

- In a recent study (Annex 1, Link 2) annual expenditure by salmon and sea trout anglers was estimated to be about £30 million for 430k days fished in England and Wales, indicating a mean expenditure per day of about £70.
- This estimate not only included trip costs, (such as travel, bait, permit, accommodation) but also non-specific costs (such as magazines, equipment, specialist clothing and footwear).

## 2.12 **Willingness to pay:**

- No recent studies have been made of salmon anglers' nett willingness to pay, that is their consumer surplus.
- A study of willingness-to-pay in 2001 estimated average consumers' surplus for game anglers at about £3.30/day (adjusted to 2007 prices). However, most game anglers fish for non-migratory trout not salmon. Given the generally higher expenditure by salmon anglers, this may be an underestimate for salmon fishing.

## 2.13 **Motivation:**

- There has been no study of salmon anglers specifically. A recent study (see Annex 1, Link 3) confirmed that freshwater anglers in general fish for pleasure and recreation.
- However, as indicated in 2.8 above, some anglers also derive some commercial benefit from their catch.

#### 2.14 **Magnitude and attitude towards catch & release:**

- 56 percent of the declared catch was released in 2006. This has risen from 10 percent in 1993.
- While the need for at least some catch & release is widely accepted amongst anglers, a proportion has been strongly against it. It has been mandatory before 16 June since 1999, and angling effort has fallen subsequently.
- Licence sales fell by 12 percent from 1998 to 1999 but have since recovered almost to previous levels.
- The number of days fished over the season, declared on catch returns, fell by 21 percent but has not recovered significantly since.
- A telephone survey of anglers indicated that fishing effort before 16 June fell by about 40 per cent after the introduction of mandatory catch-and-release.
- However, the voluntary practice of catch and release from 16 June has been increasing indicating an increased acceptance of the practice.
- Also recent consultation on continuing mandatory catch and release before 16 June indicates broad support, compared with significant antipathy to its introduction in 1999.

#### 2.15 **Number of businesses/ number of jobs created by/ depending on a salmon fishery:**

- As part of a wider project, summarised in Annex 1 (Link 2), an economic impact study has just been completed for freshwater angling in England and Wales which assesses impacts on both regional and national economies.
- For England and Wales as a whole, salmon and sea trout angling contributes (through direct, indirect and induced effects) about £29 million to household incomes (gross value added or GVA), supporting about 1200 full-time job equivalents (FTEs).
- However, if salmon fishing were to cease (for example, because of *Gyrodactylus*) only some of these jobs, about 450 FTEs, would be lost, as current expenditure on salmon angling would be diverted elsewhere within the national economy.
- Specific estimates are separately available for the local economies of Wales and each of the nine English regions.
- For example, salmon and sea trout angling contributes about £32 million to household incomes in Wales, supporting about 260 full-time job equivalents (FTEs). If it were to cease entirely, 140 jobs would be lost in Wales and with them about £3 million income to Welsh households.
- Estimates of average marginal impact are also available nationally and for each region. For example, nationally, roughly one FTE job would be generated for every extra 1000 days salmon fishing generated or lost.

### 3.0 **Non-consumptive uses**

### 3.1 **Description of non-consumptive uses:**

- Salmon tours of salmon leaps and spawning areas are organised by local rivers trusts in the autumn which are fully subscribed usually by angling interests.
- Informal watching of salmon and sea trout is common wherever accessible ‘salmon leaps’ exist. At one well-known falls in Wales, Annual expenditure by visiting coach parties in the vicinity of a well-known falls has been estimated at £50k annually.
- Links with local art projects, such as the Tyne Salmon Trail (‘an iconic interactive art project celebrating the Tyne as England’s premier salmon river’).
- The scale and impact of these uses are generally not documented.

## 4.0 **Existence of salmon**

### 4.1 **General public including fishing right holders, fishermen and fishing related industries, willingness-to-pay:**

- An assessment of the total value of salmon to the general public, has just been completed for England and Wales (Link 3); Annex 1 is a summary of the whole project.
- The average willingness-to-pay per household to prevent a severe decline in salmon stocks from a disease (an analogy for *Gyrodactylus*) was £15.80 per year for 25 years.
- Willingness-to-pay was highly variable and skewed: about a third were not willing to pay anything, whilst a few would pay a hundred or more pounds per year.
- Aggregating across all households gives a total of willingness to pay of £350 million per year.
- If it were deemed appropriate to capitalise this over the 25 years, it would equate to a present value of £6 billion. This is about 50 times greater than the estimated capital value of fishing rights (see 2.8 above) indicating that the existence value is the most significant component.
- Efforts were made in this evaluation to separate the public’s valuation of salmon from that of general river quality.
- Estimates were made of the contribution of individual rivers to the total. The Thames was estimated to contribute £3.2 million per year and the Wye at £4.9 million per year. These estimates are an order of magnitude less than previous estimates of ‘existence value’ for these two rivers. In part this probably reflects the recent evaluation’s separation, in part at least, of salmon from general river quality.
- A separate assessment, a choice experiment, looked at proportional changes in willingness-to-pay relative to stock status. As indicated in Figure 1, any improvement in stock status for salmon was significantly valued. In contrast, stocks of other freshwater fish were apparently not valued by the public if they were poor.



Fig. 1: Willingness to pay to move between different levels of salmon stocks

## 5.0 Social ceremonial and cultural aspects

### 5.1 Main shareholders

#### 5.1.1 Indigenous people:

- Salmon are linked into local culture in various parts of England and Wales.
- Example: the 'salmon of knowledge' in the Welsh folk tales – the Mabinogion.
- Example: they appear on pub signs and in the names of hotels.
- Example: the salmon is one of the four Dacre beasts, heraldic symbols.
- Example: they appear in modern sculptures such as at Ross-on-Wye.

#### 5.1.2 People carrying out historic fishing activities:

- Most salmon fishing methods other than rod and line in use on England and Wales have a long tradition and at least some local cultural significance.
- Example: there is a mural next to the Exe estuary depicting seine netting.
- Example: the haaf net fishery in the Solway estuary is reputed to go back over a thousand years to Viking times.
- In 2004, a contingent valuation of coracle fishing (Link 4), specific to Wales, indicated that the Welsh people would be willing to pay £1.5 million, as a one-off payment, to maintain a minimal fishery, though little more to sustain a higher level of fishing. The Welsh Assembly Government has recognised the cultural significance of certain salmon net fisheries.
- The same study valued a minimal traditional fishery on the Severn estuary (putchers, stop boats, seine nets and lave nets) at in excess of £5 million. Willingness to pay was higher on average for people living locally.
- 38 percent of the people surveyed expressed an interest in visiting the Severn to observe traditional fishing.
- There are a few open days and a visitor centre for some traditional net fisheries in the Severn Estuary.
- It is likely that raising awareness of these historical methods would also raise their value to the general public.

## 6.1 Environmental aspects with particular reference to biodiversity value:

6.1.1-6.1.3 No information available.

**6.1.4 Value and impact of listing salmon, such as under the EU Habitats Directive:**

- no evaluation has been made of the costs associated with reviews of consents on rivers listed under the Habitats Directive.
- techniques are being developed to evaluate benefits derived from improving the ecological status of rivers in line with the Water Framework Directive but these do not consider the salmon separately.

**Links:**

1. Annual Assessment of Salmon Stocks and Fisheries in England and Wales 2006  
[http://www.environment-agency.gov.uk/subjects/fish/165773/169852/1748738/?version=1&lang=\\_e](http://www.environment-agency.gov.uk/subjects/fish/165773/169852/1748738/?version=1&lang=_e)
2. Economic evaluation of inland fisheries: the economic impact of freshwater angling in England and Wales.  
<http://publications.environment-agency.gov.uk/pdf/SCHO1207BNNW-e-e.pdf>
3. Economic evaluation of inland fisheries: Welfare benefits of inland fisheries in England and Wales.  
<http://publications.environment-agency.gov.uk/pdf/SCHO1207BNNV-e-e.pdf>
4. Method for assessing the heritage value of net fisheries.  
<http://publications.environment-agency.gov.uk/pdf/SCHO0904BIDF-e-e.pdf>

**Annex 1**  
**: Economic evaluation of inland fisheries**  
Environment Agency Science Summary, SC050026/SS

science  
summary



Environment  
Agency

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

## Economic evaluation of inland fisheries

### Science Summary SC050026/SS

Research commissioned by the Environment Agency and the Department for Environment, Food and Rural Affairs (Defra) has looked at economic aspects of freshwater fish and fishing. Expenditure by freshwater anglers in England and Wales supports about a billion pounds of household income equating to 37,000 fulltime jobs. A separate study assessed the total economic value of salmon. It concluded that, on average, the public would be willing to pay £15.80 per household per year to prevent a disease causing a severe decline in salmon stocks. Across England and Wales this amounts to a value of around £350 million per year.

Two reports, Module A and Module B, were produced for this study. Module A used a contingent valuation survey to estimate the general public's willingness to pay (WTP) to preserve salmon stocks. Choice experiments examined the relative values to the public of changes in salmon stocks; stocks of other freshwater fish; and general river quality. The health and social benefits of angling are touched on. Module B estimated the annual expenditure on different types of freshwater angling in England and Wales, along with the economic activity and jobs supported by this angling, and the likely impact on regional economies of changes in the level on angling activity.

#### **Module A: Welfare benefits of inland fisheries in England and Wales**

##### *i) Contingent valuation method: Impact of a severe decline in salmon*

A face-to-face survey of 911 members of the general public was carried out in the summer of 2006 in 23 locations, with the profile of respondents broadly representative of the population of England and Wales. The contingent valuation survey found that mean WTP to prevent "a severe decline in all salmon populations across [England and Wales], with 95 per cent of salmon being lost for at least 25 years" was £15.80 per household per year.

Aggregated across all households in England and Wales, this amounts to a total of around £350 million per year.

Potential biases were considered and addressed. The most likely source of bias was if some respondents included general river quality (rather than just salmon stocks) when considering their WTP; if so, the above figure would be an overestimate. This was minimised by using a scenario that focused on salmon alone, analogous to the impact of the introduction and spread of a parasite on salmon, *Gyrodactylus salaris*.

WTP was higher in people who used rivers more frequently, had higher incomes, had some educational qualifications, were older or had fewer children.

Follow-up questions investigated how this total WTP should be allocated between individual rivers. WTP was higher for longer rivers than for shorter ones, but was not affected by the river being in an urban/rural setting or having protected status for salmon. Evidence was found of 'distance decay', with WTP for a named river decreasing as the distance between the place of residence and the river increased.

##### *ii) Choice experiment: Value of different changes*

The public survey incorporated a choice experiment, which looked at the magnitude of WTP for changes between four levels of quality (good, moderate, poor and dead/none), for each of three attributes (number of salmon; other fish; general river quality).

Policies that aimed to improve rivers from 'dead' to a 'poor' state had little impact on welfare, but moving from 'poor' to 'moderate' had a large WTP effect. A further improvement to 'Good' would generate significant further benefits.

Substantial 'loss aversion' was also found, where WTP to prevent a loss in quality was significantly greater than WTP for a comparable improvement.

##### *iii) Health and social welfare*

Module A assessed the physical exercise gained from angling through a survey of anglers. No evidence was found of a significant increase in physical exercise compared to alternative activities. Aspects such as the relaxation obtained and the “break from everyday life” were found to be much more important benefits.

### **Module B: The economic impact of freshwater angling in England and Wales**

The Environment Agency holds a list of all anglers licensed to fish in England and Wales. Three thousand anglers from this list were telephoned to identify,:

- 1) The number of angler days undertaken in the last year for three fish species (coarse; trout; salmon and sea trout) and three surface water types (canals; stillwaters; rivers).
- 2) Angler expenditure whilst fishing for the three fish species
- 3) Anglers’ likely action if the types of angling they did were not available.

Separate results are presented for Wales and for each Government Office region in England, as well as for England and Wales as a whole.

An internet survey, using the same questionnaire as the phone survey, received a further 4,000 responses.

The number of licence holders in each ‘region’ was used to scale up observations on the average number of angler days for each fish species/region/surface water combination. The study found that licensed anglers undertook a total of 30 million angler days on inland fisheries in England and Wales in 2005, with 26 million on coarse angling.

For each species, estimates were made of the total expenditure by anglers, looking at the proportion of expenditure that had a regional impact and the magnitude of that (direct) effect. The project used the DREAM® suite of models developed by CogentSI Ltd to estimate the direct effect and subsequent knock-on effects, calculating the total number of jobs and household income supported by angling expenditure. For example, across England and Wales, anglers’ gross expenditure was £1.18 billion, which supported around 37,000 jobs and £980 million of household income.

The economic impact of ceasing a type of angling was then assessed for each species/region combination, by identifying how much expenditure would be lost and what the impact would be on income and employment.

Average estimates are presented of the economic impact of marginal changes in the level of each type of angling in each region. With caution, these could be used to indicate the regional and national economic impact of increases or decreases in angling activity.

### **Summary**

Module A estimated the welfare benefits of angling and the value of fish stocks to the general public. Module B explored the expenditure by anglers in England and Wales. These reports should be of interest to decisionmakers at national, regional and local levels. Specific uses could include informing the Periodic Review; selecting measures under the Water Framework Directive; prioritising investment in fisheries; developing Salmon Action Plans; and designing programmes to control outbreaks of fish disease.

**This summary relates to information from Science Project SC050026/SR, reported in detail in the following output(s):-**

#### **Science Project SC050026/SR1**

**Title:** Economic Evaluation of Inland Fisheries: Welfare benefits of inland fisheries in England & Wales

**ISBN: 978-1-84432-850-5 December 2007 Product Code: SCHO1207BNNV-E-P**

#### **Science Project SC050026/SR2**



**Title:** Economic Evaluation of Inland Fisheries. The economic impact of freshwater angling in England & Wales

**ISBN:** 978-1-84432-851-2 December 2007

**Product Code:** SCHO1207BNNW-E-P

**Internal Status:** Released to all regions

**External Status:** Publicly available

The project was initiated and managed for the Environment Agency by Guy Mawle, Fisheries Policy Manager, Environment Agency, Rio House, Waterside Drive, Bristol, BS32 4UD

**Lead Research Contractor:** Jacobs UK Ltd., 27 Abercromby Place, Edinburgh EH3 6QE. Keith Lawrence and James Spurgeon were authors of Module A in collaboration with Professor Ken Willis of the University of Newcastle; and Rainbow Research.

**Module B Research Contractor:** Alan Radford, and Geoff Riddington, both of Glasgow Caledonian University, and Hervey Gibson of CogentSI Ltd.

This project was funded by the Environment Agency's Science Group and Defra. The Science Group provides scientific knowledge, tools and techniques to enable us to protect and manage the environment as effectively as possible.

Further copies of this summary and related report(s) are available from our [publications catalogue](#) on or our National Customer Contact Centre T: 08708 506506  
or E: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk).

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## EU-UK(Scotland)

| Commercial salmon fisheries   |   |
|---|---|
| Identification of Stakeholders  |   |
| Fishing right holders   | All salmon fisheries are privately owned. Owners may be individuals, companies, Local Authorities, Crown Estate, Scottish Government (not let).   |
| Fishermen other than fishing right holders  | Some fisheries are operated by tenants.   |
| Commercial fishing related industries   | Boat-building; net supply; rope, chain and anchor supply; fish box supply; ice machine supply; road haulage; salmon smoking   |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) | <p><b>All</b> salmon fishing in Scotland, including in the sea, is operated by way of <b>private, heritable titles which may be held in association with or separate from any land</b>. Fisheries may be operated by the owners of the rights or by tenants. Methods of fishing are prescribed in the <b>Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003</b>, and methods of construction of nets (including dimensions of nets, mesh size, twine thickness, hanging ratios) are defined in the <b>Salmon (Definition of Methods of Net Fishing and Construction of Nets) (Scotland) Regulations 1992</b>, as amended in 1993 and 1994. Monofilament twine may not be used in any part of a net used in fishing for salmon. No part of any net may be designed, constructed or used to catch salmon by enmeshing them. The 2003 Act specifies a weekly close time of 60 hours, and an annual close time of a continuous period of not less than 168 days (153 days in the Tweed District). Start and finish dates of the annual close time differs slightly in different districts, but the fishing season generally extend from mid February until end August. Members of the Salmon Net Fishing Association of Scotland have agreed not to fish before 1 April. In the Esk salmon fishery district, the end of the annual close time has been changed from 15 February until 30 April (<b>The Annual Close Time) Esk salmon Fishery District Order 2005</b>) i.e. netting not permitted until 1 May, and netting effort in the period 1 May</p> |

|   |   |
|---|---|
|   | until 31 May has been capped ( <b>The Conservation of Salmon (Esk Salmon Fishery District) Regulations 2005.</b> )  |
| Number of fishermen including trends  | <p>Net &amp; Coble – annual index of no employed <math>[(\text{max}+\text{min})/2]</math> for period 1994-2006. Declined from 925 (1994) to 259 (2006)</p> <p>Fixed Engine - annual index of no employed <math>[(\text{max}+\text{min})/2]</math> for period 1994-2006. Declined from 547 in 1995 to 228 in 2001, then rose to 254 in 2005, and 244 in 2006.</p> <p>NB – these data exclude fixed engine fishermen in the Solway, where effort recording comparable with that for fixed engines elsewhere in Scotland has not been possible.</p>  |
| Demographic characteristics of fishermen: e.g. age, gender  | This has not been documented, but there are few under 50 years of age, and almost exclusively male.   |
| Catch, CPUE, (mean annual reported catch)   | <p>Catch – 2006 figures (wild salmon only):</p> <p>Net &amp; Coble – 4461 Grilse (8.8 t)</p> <p>- 1700 MSW salmon (7.7 t)</p> <p>Fixed Engines – 13091 Grilse (28.8 t)</p> <p>- 5709 MSW salmon (27.6 t)</p> <p>CPUE – 2006 figures (1SW+MSW)</p> <p>Net &amp; coble – 75.1 fish per crew month</p> <p>Fixed Engine – 55.6 fish per trap month</p> <p>NB CPUE derived by:</p> <p>Net &amp; Coble – catch/median crew month value</p> <p>Fixed Engine – catch/median trap month value</p> <p>NB – these data exclude fixed engine fishing in the Solway, where effort recording comparable with that for fixed engines elsewhere in Scotland has not been possible because of the way gear units are recorded in different fisheries.</p> <p><b><i>See annexed graphs for 1952-2006, netting catch, effort and CPUE.</i></b></p> |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon) | Market value of catch – first sale estimate based on an average price of £15/kg and 73 tonnes catch - £1.1M. Catch has declined from 1800 tonnes in 1967 to 73 tonnes in 2006. Prices have risen, however, and exceed £30/kg early in the season and on   |

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|--|--|
|  | <p>fish exported to Continental Europe.<br/>Smoked wild salmon prices from specialist smokers in Scotland are quoted at about £120/kg.</p> <p>Prices for fresh wild salmon are on average about 6 times that of farmed salmon.</p> <p>Smoked farmed salmon prices from specialist smokers in Scotland are quoted at about £50/kg.</p> <p>Capital value of all commercial salmon fisheries not known. Recent sales of individual stations have realised up to £0.5M, including land and properties.</p> |
| Type(s) of gear in use, number of gear                               | <p>Inside estuary limits – net and coble (sweep net)<br/>Outside estuary limits – net and coble; bag net, fly net or other stake net. In Solway Firth there are also haaf net and poke net fisheries.</p> <p>2006 figures:<br/>Net and coble – 32 active stations<br/>Fixed engines – 45 active stations (including haaf and poke nets)</p>  |
| Costs associated with the activity                                   | <p>Coble (boat) – bag net fishing (with inboard engine) ~£15k<br/>Net and coble fishing (oars) ~£4k<br/>Nets – fixed engine + moorings e.g. 1 bag net +moorings ~£2k<br/>sweep net e.g. 80m net ~£2k<br/>Sweep net is expensive because of the materials used and the amount of work involved in rigging – different hanging ratios in different parts of the net.<br/>Information provided by working netmen.</p>   |
| Motivations for fishing ...(important for combined types of fishing) | <p>Salmon fishing provides the principal source of income in many cases. Many fishermen are from salmon fishing families dating back several generations. Haaf net fishermen in Solway maintain that method dates back to Viking times, is a tradition of significant local importance, and undertaken largely for recreational purposes (although fish are sold).</p>   |
| Profitability  | <p>No data available</p>   |

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|  |   |
| <b>Recreational salmon fisheries</b>   |   |
| Identification of main stakeholders  |   |
| Fishing right holders  | All salmon fisheries are privately owned. Owners may be individuals, companies. Local Authorities, Crown Estate.  |
| Fishermen  | Owners, guests, paying tenants  |
| Sport fishing related industries   |   |
| Guiding  | Numerous companies, fishing organisations and individuals providing guiding facilities. Many beats on larger rivers provide a gillie as part of the lease.  |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   | VisitScotland is promoting angling in general as a tourist attraction. On-line booking services provide real time data on catches, river levels, beat availability, accommodation etc.  |
| Sport fishing equipment producers and retailers  | Numerous tackle shops throughout Scotland, significant mail order and on-line sales of equipment.   |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | <b>All salmon fishing in Scotland is operated by way of private, heritable titles, which may be held in association with or separate from any land.</b> Fishing may be operated by the owners of the rights or by persons with written permission from the owners (2003 Act). Rod and line fishing is defined in the <b>as amended by the Aquaculture and Fisheries (Scotland) Act 2007</b> . Certain baits and lures may be <b>prohibited</b> in specified areas and at specified times by Regulations made by Scottish Ministers. Such regulations are <b>in force in 22 salmon fishery districts</b> . These regulations are Statutory Instruments and prohibit the use of various baits, such as prawns, shrimps, worms and the use of certain types of lure and/or barbed hooks. No salmon caught by rod and line may be sold in Scotland ( <b>The Conservation of Salmon (Prohibition of sale) (Scotland) Regulations 2002</b> ). The <b>2003 Act</b> provides for a <b>weekly close time (Sunday) and periods within the annual close time when angling may continue</b> . Some angling fisheries start in <b>mid January</b> , and some continue until <b>end November</b> . Mandatory catch and release, |

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|  | and the mandatory use of barbless hooks is required until 31 May each year in the Esk salmon fishery district under <b>The Conservation of Salmon (Esk Salmon Fishery District) Regulations 2005</b> . Mandatory catch and release is required until 31 May each year in the Annan salmon fishery district under <b>The Conservation of Salmon (Annan Salmon Fishery District) Regulations 2005</b> .)   |
| Number of rivers   | 383 - in NASCO database  |
| Number of fishermen  | Not known  |
| Number of fishing days   | ~467000 <sup>a</sup>   |
| Demographic characteristics: e.g. age, gender                  | Not documented. Perception is that salmon anglers predominantly male and generally middle-aged.  |
| Catch, CPUE, mean annual reported catch                        | <p>Catch - 2006 figures (wild salmon only):<br/> Grilse – 18625 (36.5 t)<br/> MSW salmon – 19805 (80.9 t)</p> <p><i>See annexed graph for 1952-2006 figures (relating to catches of wild Atlantic salmon in Scotland)</i><br/> No effort data collected</p>  |
| Market value (e.g. of catch, including trends, fishing rights) | <p>Offence to sell, in Scotland, salmon caught by rod and line - <b>(The Conservation of Salmon (Prohibition of sale) (Scotland) Regulations 2002)</b>.</p> <p>Capital value of Scotland's salmon rod fisheries estimated at <b>£511.05M<sup>a</sup></b><br/> Sales of rod fisheries on some major salmon rivers have realised in excess of £1.5M. Fishing rights may also be sold on a time-share basis – certain weeks during the season, each season for a number of years. Prices realised may be up to £250000 for 2 weeks per season for 30 years.</p> |
| Gear in use, preferences of gear                               | <p>Rod and line – fly, spinning, bait (invertebrate only) – NB baits and lures regulations in force in 22 salmon fishery districts.</p> <p>Some haaf net fishermen in the Solway maintain that their</p>   |

|  |  |
|--|--|
|  | fishery is recreational, although the fish caught are sold.  |
| Types of fishing licensing – prices, indicators                                      | No licences. Fishing by owners of rights or by those with written permission of the owners. Permit prices vary between £10 and £several hundreds per day.  |
| Costs connected with the activities  | Costs include:<br>Owners – District Salmon Fishery Board assessments<br>- Gillie wages<br>- fishery maintenance (banks, boats etc)<br><br>Anglers <sup>a</sup> - £61.65M per annum angler spend on salmon fishing includes permits, accommodation, tackle, travel etc. |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | See An Economic Evaluation of the Impact of the Salmon Parasite <i>Gyrodactylus salaris</i> (Gs) Should it be Introduced into Scotland <sup>a</sup>  |
| Motivation   | No commercial motivation. Angling organisations indicate that anglers' primary motivation is pleasure/recreation.  |
| Magnitude of and attitude towards Catch & Release                                    | 2006 figures – Grilse 50% C&R<br>- MSW salmon 59% C&R<br>In some rivers, such Dee (Aberdeen), C&R is nearly 100%<br>Levels of C&R for grilse and salmon have risen from 6% and 9% respectively since records first kept in 1994.                                       |
| Number of businesses/number of jobs created by /depending on a salmon fishery        | Economic Impact Assessment <sup>a</sup> in 2006 estimated some 1966 FTE jobs would be lost if Scotland lost salmon as a result of Gs being introduced and becoming widespread.   |

<sup>a</sup> - An Economic Evaluation of the Impact of the Salmon Parasite *Gyrodactylus salaris* (Gs) Should it be Introduced into Scotland – Published by the Scottish Executive 2006. Authors: Glasgow Caledonian University - Riddington, G, and Radford, A; University of Stirling – Paffrath, S, Bostock, J and Shinn, A.

may be accessed at: <http://www.scotland.gov.uk/Resource/Doc/1062/0042434.pdf>

| <b>NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity</b>  |   |
|--|---|
| Description of non-consumptive uses  | Visitors (numbers not known) to facilities such as Salmon Ladder at Pitlochry Dam, Phillipshaugh Visitor Centre on Ettrick (tributary of Tweed), Tugnet Ice House (Spey), Scottish Fisheries Museum (Anstruther). Visitors (numbers not known) to natural falls such as Falls of Rogie (Conon), Linn of Dee (Aberdeenshire), Loups of Burn (Esk), Buchanty Spout (Tay). Fisheries Trusts throughout Scotland organise field trips, and “Salmon in the Classroom” educational initiatives. |
| Demographic characteristics: e.g. age, gender of users   | No information  |
| Costs connected with the activities  | No information  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)                       | No information  |
| Motivation   | No information – likely to be general public interest in salmon/environment   |
| Number of businesses/number of jobs created/depending these activities                                     | No information  |
| <b>Existence of salmon</b>   |   |
| Main stakeholders  |   |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | No information  |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | No information  |



| <b>Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries</b>  |   |
|--|---|
| Main stakeholders  |   |
| Indigenous people (Sami people, first nations...)  | Salmon long held to be iconic species in Scotland. In ancient Celtic folklore, salmon was symbol of wisdom. Carvings of salmon on Pictish stones at e.g. Roseilse (Morayshire), (Glamis (Tayside) and Robertlaw (Borders). Salmon in Coat of Arms of e.g. Glasgow, Peebles. |
| People carrying out historic fishing activities  | Haaf net fishery in Solway reputed to date back to Viking times. Records of net fishing on River Tweed date back to 11 <sup>th</sup> century. Long tradition of angling for food. Angling as a sport developed quickly as railway network expanded.                         |
| <b>Environmental aspects with particular reference to biodiversity value</b>   |   |
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | Atlantic salmon listed on Annex II of EC Habitats and Species Directive. 17 rivers designated with Atlantic salmon as a species of interest (either principal or secondary interest).   |
| Genetic reserve for aquaculture  | Recognition of value of wild salmon stocks as reserve.  |
| Genetic reserve for the survival of the species under changing (climate) conditions  | 383 salmon rivers on NASCO database. Likely that there are many more distinct genetic populations than this. Large rivers may support many more-or-less reproductively isolated populations.  |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | No separate evaluation of salmon resource. EC Water Framework Directive requires improvement/maintenance of ecological status of aquatic environment – salmon inevitably included in this.  |

| <b>Management Costs</b>                      |   |
|--|---|
| District Salmon Fishery Board (DSFB) Funding | ~£3.5M per annum across Scotland raised by way of DSFB Fishery Assessments on salmon fisheries <sup>b</sup>   |
| Separate Private Funding                     | Monies paid by individual owners of salmon fisheries to maintain their fisheries, employ gillies etc. No figures are available but the total spend may be of a similar magnitude to DSFB funding. |

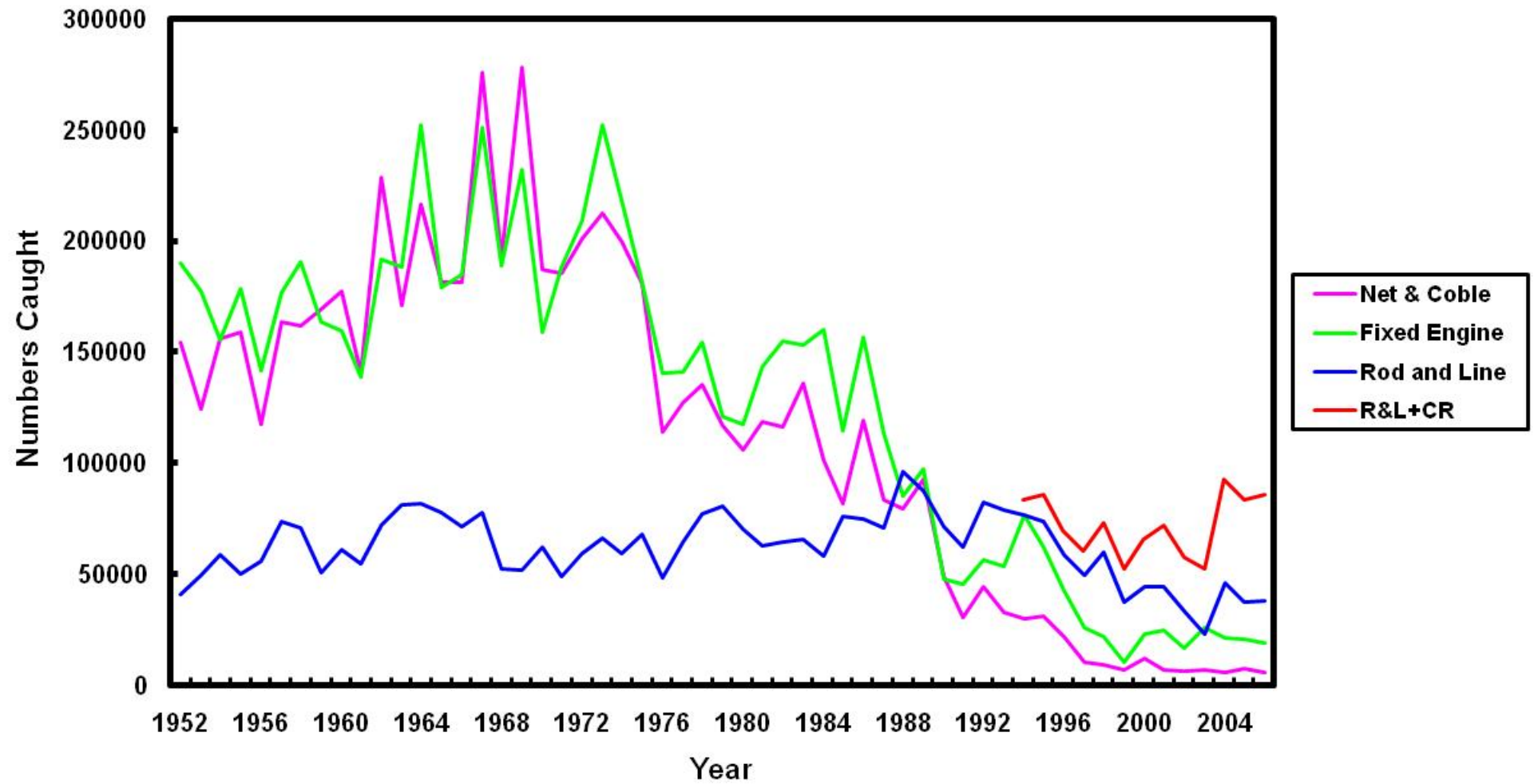
<sup>b</sup> A Strategic Framework for Scottish Freshwater Fisheries: A Consultation Document. Published by the Scottish Government 2007

may be accessed at: <http://www.scotland.gov.uk/Publications/2007/09/13103142/0>

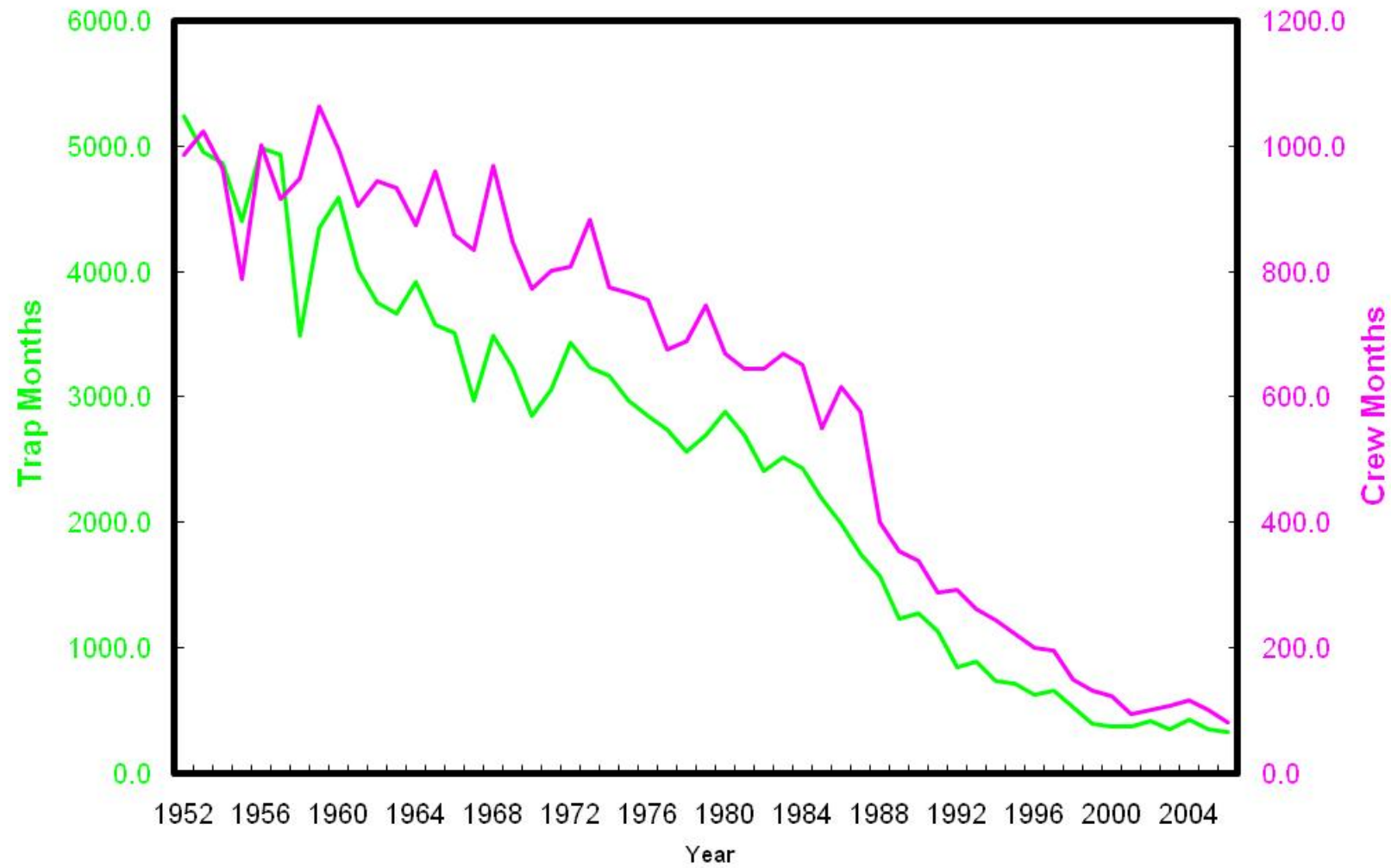
**Note:**

**The graphs that follow show trends in salmon catch by all gears, netting effort and CPUE in net fisheries for Scotland. The data used in these graphs is available in spreadsheet format if required.**

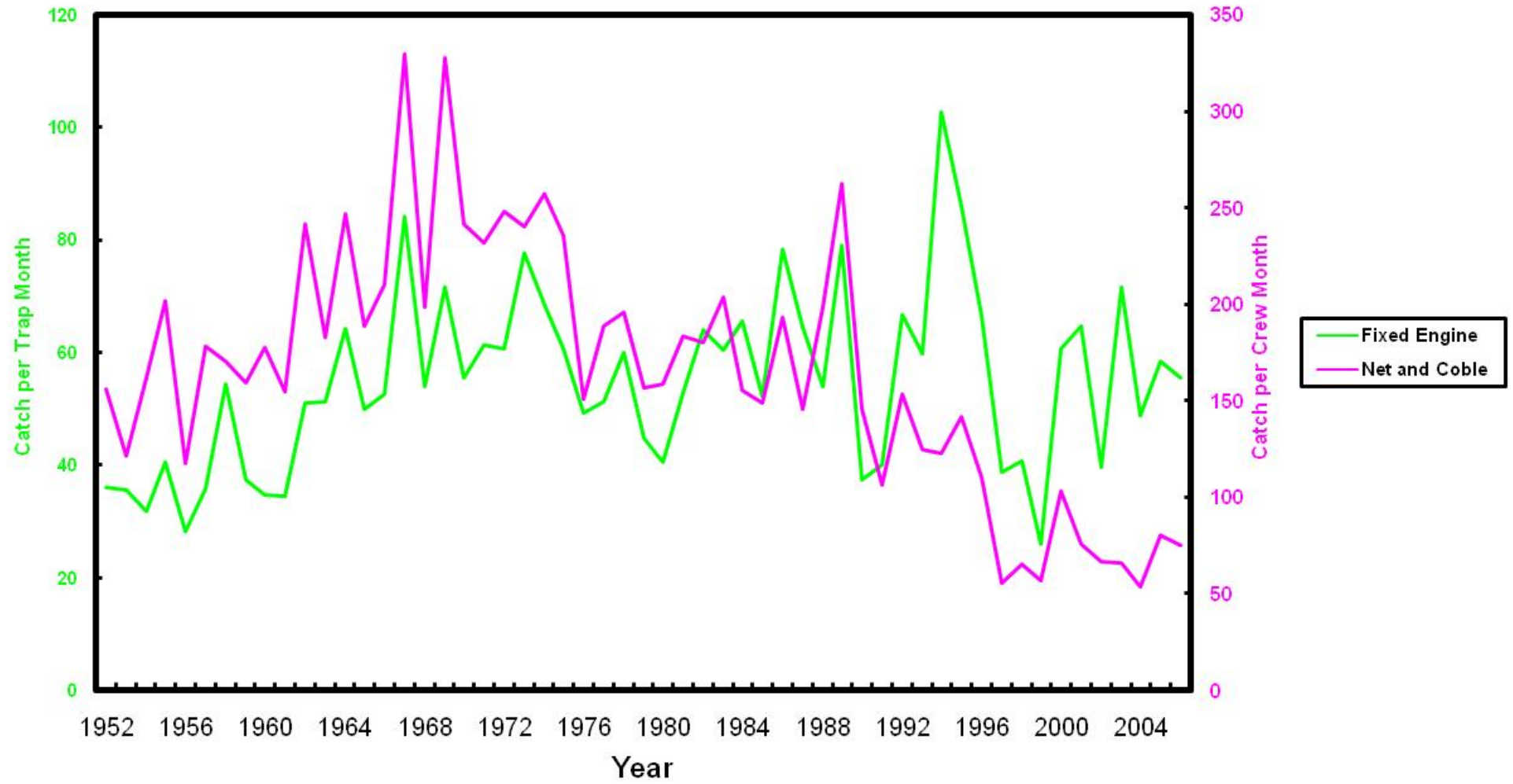
## Scottish Salmon Catches 1952-2006



## Scottish Netting Effort - Annual Median Values



## CPUE in Scottish Salmon Net Fisheries



## Iceland

| <b>Commercial salmon fisheries (including heritage fisheries) and subsistence fisheries</b>   |   |
|---|---|
| Identification of Stakeholders  |   |
| Fishing right holders   | All salmon fisheries are privately owned. Fishing rights goes with adjacent land and can't be sold separately. All landowners have to form a Fisheries association that manages the fishing rights within each river or tributary. Each fishery association are founded by law with agreements that need to be accepted by the Ministry of Fisheries and Agriculture. It includes a list of all farms/landowners. Within its jurisdiction the Fishery Association is to local authority responsible for sustainable harvest of the salmon stocks within the frame of the law.   |
| Fishermen other than fishing right holders  | Commercial net fishery can only be operated by landowners.  |
| Commercial fishing related industries   | Small scale salmon smoking industry, marketing of fresh fish.   |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) | All salmon fisheries for salmon in Iceland are in freshwaters. The number of gear (gillnets) and fishing methods must remain the same as operated in the five year period before 1957. Annual fishing time is at a maximum of 105 days from 20 May to 30 September. The weekly fishing time is for Tuesday 10AM to Friday 10PM i.e. 84 hours weekly closure over weekends. There are restrictions on mesh size to the minimum of 45 mm (knot to knot). The allowed length of each net may not exceed 1/3 of the river width with an open passage in the main stream of the river.   |
| Number of fishermen including trends  | The number of nets operated varies between years. Costal fishery for salmon ended with a buy out in 1997. Fishery with 62 nets in lower part of the glacier river, River Hvita, West-Iceland have not been operated since 1991 with a lease agreement of net fishing rights of the Fisheries Associations in clear water tributaries operating rod fisheries. This is and agreement based on a business ground. The higher prospects of rod catch increases the value of rod fishery and is used to pay for the non-netfishing. This model is likely to be used in the other remaining net fisheries due to the much higher price for salmon in angling fisheries than net fisheries. |
| Demographic characteristics of fishermen: e.g. age, gender  | This has not been documented, but there are relatively few farmers under 50 years of age, and almost exclusively males.   |
| Catch, CPUE, (mean annual reported catch)   | A comprehensive catch records is available. The annual average catch 1974-2006 is 12440 fish. The catch in 2006 was 5.953 fish, 16.544 kg.  |

|   |   |
|---|---|
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon) | The value is approximately 110.000 € (9.9 million ISK). The market price follows the fish market price for reared salmon. No compensation paid.   |
| Type(s) of gear in use, number of gear  | Gillnets. The number of gear used can vary between years and within the fishing season due to i.e. water level  |
| Costs associated with the activity  | Not available – low (nets, ice, transport, etc.).   |
| Motivations for fishing ...(important for combined types of fishing)  | Salmon fishing provides an additional income for farmers in many cases. In recent years farmers operates their nets to show activity and catch figures in case of possible buy-out or lease of fishing rights from anglers following the River Hvita model for net lease. |

| <b>Recreational salmon fisheries</b>                                     |   |
|--|---|
| Identification of main stakeholders                                      |   |
| Fishing right holders  | All salmon fisheries are privately owned. Fishing rights goes with land adjacent and can't be sold separately. All landowners have to form a Fisheries Association that manages the fishing rights. Each Fishery Association is founded by law with agreements accepted by the Ministry of Fisheries and Agriculture. It includes a list of all farms/landowners. The shear of income/expenditures is mainly based on the share of river bank length, historical catch records, size and quality of nursery areas. This can be re-evaluated every 8 year. Lease of angling rights is allowed for the maximum of 10 years. |
| Fishermen  | Anglers, usually from rural or semi-rural areas and foreigners on prime time.   |
| Sport fishing related industries   | Companies leasing rod fishing rights and selling licenses to anglers.<br>Operation of fishing lodges, fishing hotels, general tourist activities.<br>The salmon fishing industry supports 1200 jobs, mostly in rural areas.   |
| Guiding  | Companies, leasing rod fishing rights and selling licenses to anglers, fishing organisations and individuals provide guiding facilities for anglers. On prime time, in larger rivers, a gillie is provided as part of the lease.  |
| Tourist businesses and local/rural service businesses (grocery, fuel...) | Several companies are operating in this business directly or indirectly.  |
| Sport fishing equipment producers and retailers                          | Tackle shops selling equipment related to angling and “angling fashion”.  |



|  |  |
|--|--|
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | Annual fishing time is at a maximum of 105 days from 20 May to 30 September. Daily fishing time is 12 hours from 7AM to 10AM. There is a restricted number of rods allowed (fishing licences) in each river decided on a basis of harvest plan for their each Fisheries Association. In the harvest plan status of each salmon stock needs to be taken into account (from 2006). The harvest plan needs to be renewed every 5 year (from 2006) and needs approval by The Icelandic Food and Veterinary Authority. Fishing licenses are bought by anglers. Recording of catch in log-books is mandatory.  |
| Number of rivers   | Approximately 120  |
| Number of fishermen  | 30,9% of Icelanders (Age 16-69) regard them selves as anglers. Approx. 70.000 people in total. Number of salmon fishermen not known.   |
| Number of fishing days   | Approximately 34.000 rod-days are sold for salmon fishery annually.  |
| Demographic characteristics: e.g. age, gender  | 60% of fishermen are from urban areas and 27% from semi-urban areas. 75% males, 25% females (based on information from a Nordic survey conducted in 1999).   |
| Catch, CPUE, mean annual reported catch  | <p>Catch - 2006 figures:</p> <p>Catch 45.454</p> <p>Catch and release 8.735</p> <p>Catch landed 36.810</p> <p>Grilse landed – 32.244 (74,5 t)</p> <p>MSW (mostly 2SW) salmon landed – 4.566 (22,2 t)</p> <p>Average long term CPUE is close to 1 fish/rod/day.</p>   |
| Market value (e.g. of catch, including trends, fishing rights)   | <p>The market value is mainly through leasing/selling rod fishing licenses.</p> <p>The estimated total economic value of the salmon fishing industry is 11 billion ISK, 111 million €.</p> <p>An estimate of a sudden closure of all salmon fisheries would cause a loss of 2, – 3 billion ISK , 31-33 million € from the Icelandic economy.</p> <p>The market value of fishing licenses is decided on an open market following supply and demand. The price for salmon fishing licenses has steadily raised for the past 60 years and is still raising.</p> <p>The average salmon price for the landowner is close to 30.000 ISK (330 €) per fish.</p> <p>That will say</p> |

|  |   |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
|--|---|----------------------|-----|---------|----|----------------------|----|---------|----|----------|-----|-----------------------|----|----------------------|----|-------|----|
| Gear in use, preferences of gear   | Rod and line – fly, spinning, bait (mostly worm). Limited number of rods for each river. Fly fishing only, bag limit and/or catch and release requirements are common.  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Types of fishing licensing – prices, indicators                                      | No fishing fee paid to the state. Every fisherman needs a fishing licence. The price of fishing licenses commonly changes throughout the fishing season based on historical in-season catch records. Highest price when the in mid summer during the peak in the salmon run.  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Costs connected with the activities  | <p>No fishing fee paid to the state.<br/>A percentage distribution of detailed fishing expenditures of Icelandic anglers – based on an Nordic survey form 1999.</p> <table> <tr> <td>Automobile transport</td><td>25%</td></tr> <tr> <td>Boating</td><td>3%</td></tr> <tr> <td>Other transportation</td><td>1%</td></tr> <tr> <td>Lodging</td><td>8%</td></tr> <tr> <td>Licences</td><td>43%</td></tr> <tr> <td>Journals, books, film</td><td>4%</td></tr> <tr> <td>Extra food and drink</td><td>8%</td></tr> <tr> <td>Other</td><td>3%</td></tr> </table>  | Automobile transport | 25% | Boating | 3% | Other transportation | 1% | Lodging | 8% | Licences | 43% | Journals, books, film | 4% | Extra food and drink | 8% | Other | 3% |
| Automobile transport   | 25%   |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Boating  | 3%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Other transportation   | 1%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Lodging  | 8%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Licences   | 43%   |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Journals, books, film  | 4%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Extra food and drink   | 8%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Other  | 3%  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | <p>No recent estimates available.<br/>A survey form 1999 showed an extra willingness to pay for fishing activities was 30% of the total sum paid for fishing activities that year.</p>  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Motivation   | No commercial motivation. Primary motivation is pleasure/recreation – Business motivation relates to that big companies and banks commonly invite there biggest costumers to salmon fishing trips covering there expenditures.  |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Magnitude of and attitude towards Catch & Release                                    | <p>2006 figures – Grilse 15,2% C&amp;R<br/>- MSW salmon 39,3% C&amp;R</p> <p>Levels of C&amp;R for grilse and salmon have risen from 2,3% since records first kept in 1994 to the total of 19,2% in 2006.</p> <p>There is an increasing interest for C&amp;R in order to maintain sustainable fisheries and to prevent the existence of the MSW stock components. This also partly follows the low marked value of salmon. C&amp; R is almost exclusively practised by foreign anglers. A three year study of 4 Icelandic rivers show that 26% of the fish recorded released are caught more than once.</p> |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |
| Number of businesses/number of jobs created  | Economic Impact Assessment <sup>a</sup> in 2004 estimated some 1200 jobs are supported by the   |                      |     |         |    |                      |    |         |    |          |     |                       |    |                      |    |       |    |

|                                   |   |
|-----------------------------------|---|
| by /depending on a salmon fishery | <p>salmon fishing industry. The income from salmon fishing is important for farmers/landowners. Approximately 50% of the income to farmers in West Iceland, an area with many large salmon rivers (according to Icelandic scale), is from leasing of salmon fishing rights.</p> <p>Many Fishery Associations have enhancement programs, with a release of hatchery reared smolts to improve the angling catch. The hatchery operations support xx jobs.</p> <p>In one river, River Ranga with previously low natural salmon production close to 1 million smolts are released annually. The angling catches in River Ranga in 2007 exceeded 14.000 fish. This is close to 1/3 of the total salmon catch in Iceland in 2007. Ranching to the rods is a growing industry in Iceland and in the case of River Ranga creating a salmon base on the business model used in other rivers apart from the part that the smolts are produced in hatcheries.</p> <p>The possible impacts from hatchery reared fish on natural populations are of concerns. There a raising demand for knowledge on the possible impacts of hatchery reared fish to naturally produced fish stocks in time and space.</p> <p>One Icelandic company is a producer of fish counters (River Watcher) and another is a producer of DST fish tags that have been used for tagging of adult salmon as well as salmon smolts.</p> |
|-----------------------------------|---|

| NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity |                |
|--|----------------|
| Description of non-consumptive uses  | No information |
| Demographic characteristics: e.g. age, gender of users   | No information |
| Costs connected with the activities  | No information |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)               | No information |
| Motivation   | No information |
| Number of businesses/number of jobs created/depending these activities                             | No information |

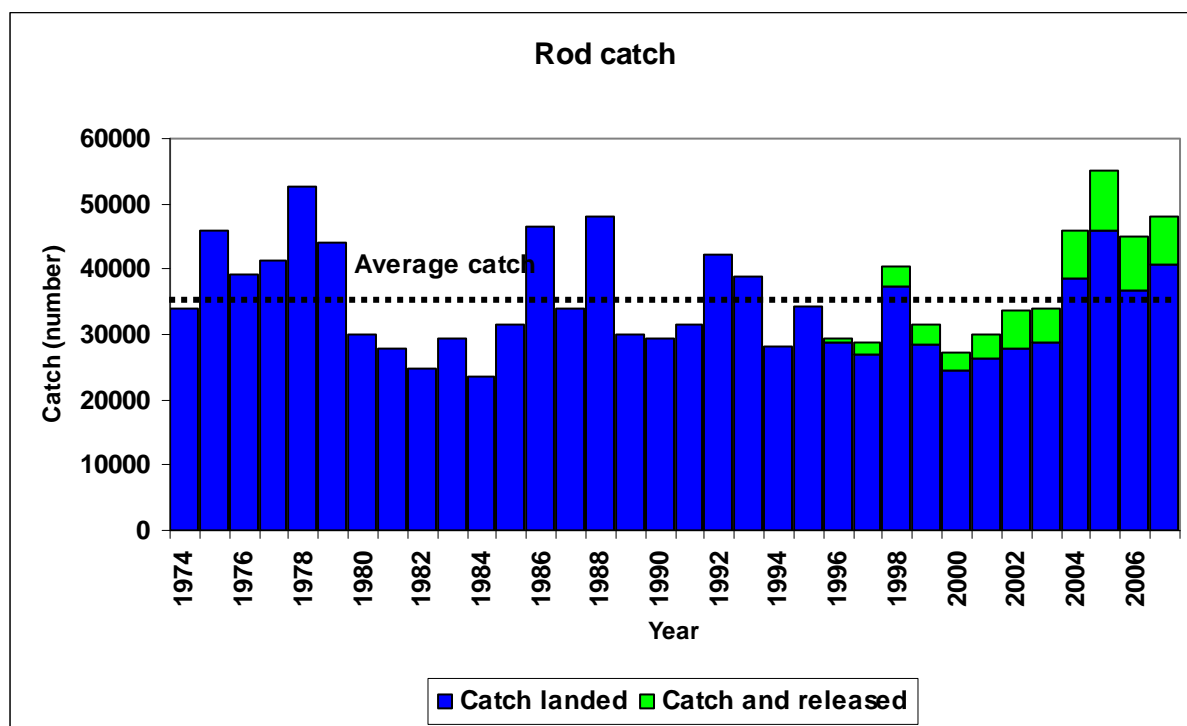
| <b>Existence of salmon</b>   |   |
|--|---|
| Main stakeholders  |   |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | No information  |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | Information from 1999, no recent surveys to relay on. |

| <b>Social ceremonial and cultural aspects</b>   |  |
|---|--|
| Main stakeholders   |  |
| Indigenous people (Sami people, first nations...)   | Salmon fishing rights have been important in Iceland since the first settlement (year 900). Conflicts related salmon fishing is described in the Icelandic Saga's. There are acts on salmon fishing in the first written laws from year 1200. The acts outlines how to shear the fishing rights and how to allow fish to enter higher regions in the rivers. |
| People carrying out historic fishing activities   | Angling was brought to Iceland from England in 1890s. Angling as a sport took over most of the earlier subsistence fishery. It is likely that at that time salmon stocks were at low levels after cold periods in the late 1700s.  |
| General public also including Fishing right holders, Fishermen and Fishing related industries |  |
| Description and magnitude of the uses   |  |
| Number of users   | No information   |
| Demographic characteristics: e.g. age, gender   | No information   |
| Costs connected with the activities   | No information   |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)          | No information   |
| Motivation  | No information.  |
| Number of businesses/number of jobs created/depending these activities                        | No information.  |

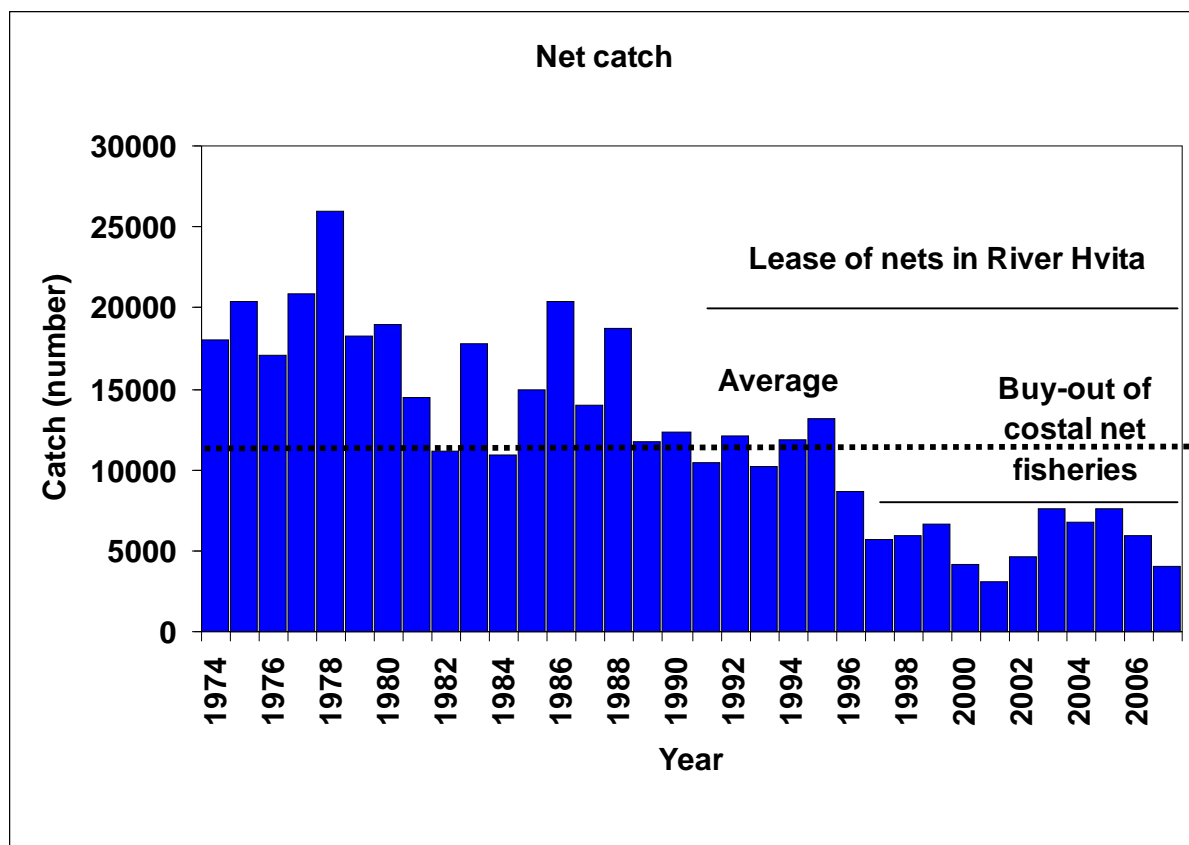
| <b>Environmental aspects with particular reference to biodiversity value</b>   |  |
|--|--|
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | <p>No official protection of areas/ivers are listed as important for there salmon stocks. The use and value of the salmon resources is, however, well known.</p> <p>In recent years salmon production in boundary areas, cold rivers and areas high above sea-level has increased. The grow rate in rivers has increase following a raise in temperature especially in spring and autumn. Smolt age has decreased in the most recent years.</p>  |
| Genetic reserve for aquaculture  | Recognition of value of wild salmon stocks as reserve has previously been acknowledged by aquaculture free areas.  |
| Genetic reserve for the survival of the species under changing (climate) conditions  | ???  |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | ???  |
| <b>Management Costs</b>  |  |
| District Salmon Fishery Board (DSFB) Funding   | <p>There is no official breakdown of salmon districts in Iceland. Approximately 25 million ISK (280.000€) is spent on the The Icelandic Food and Veterinary Authority administration and inspection of potential illegal fisheries. Approx. 75 million ISK (830.000 €) is spent on the Institue of Freshwater fisheries research activities and administration (includes others fish species and limnolocical reasearch in fresh water. Additionally lokal Fishery Associatons spend approx 40 million ISK (440.000€) on resarch and in river assesments in their river systems.</p> |
| Separate Private Funding   | Money paid by individual owners on salmon fisheries to maintain their fisheries, employ gillies, enhancement programs, building of fish ladders etc.   |

**Note:**

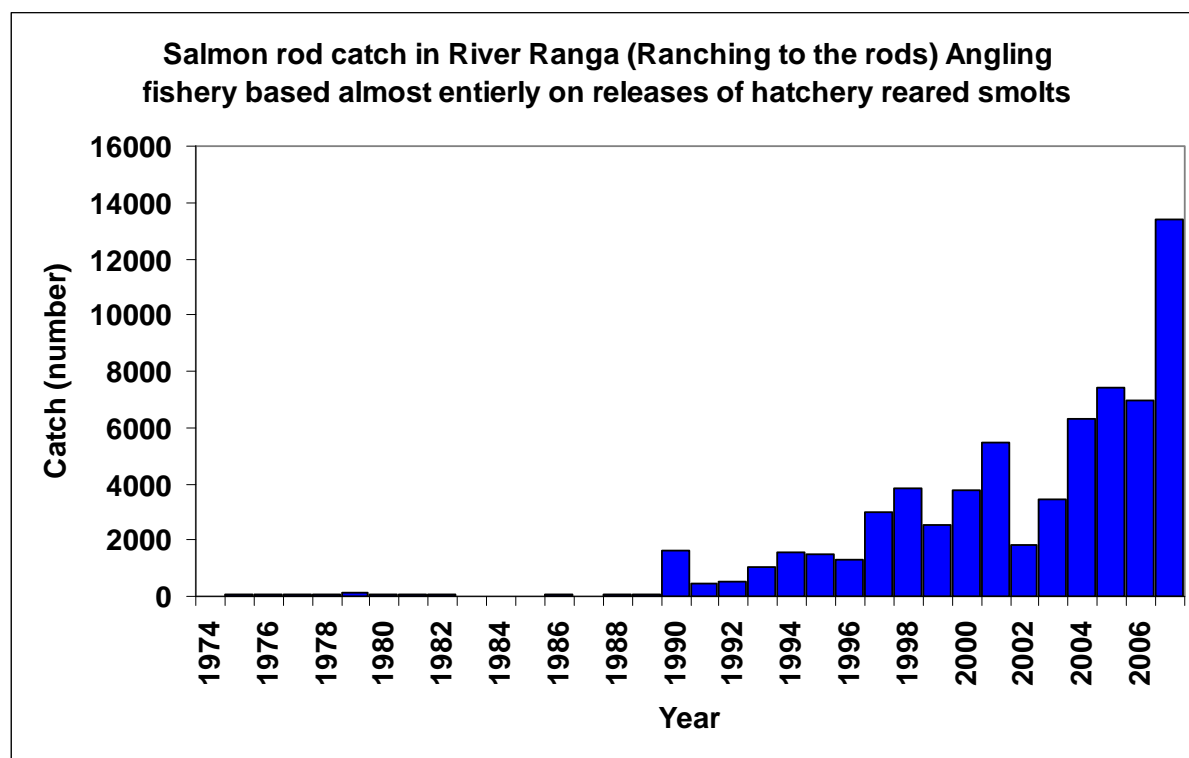
The graphs that follow show trends in salmon rod and netcatch catch for Iceland.



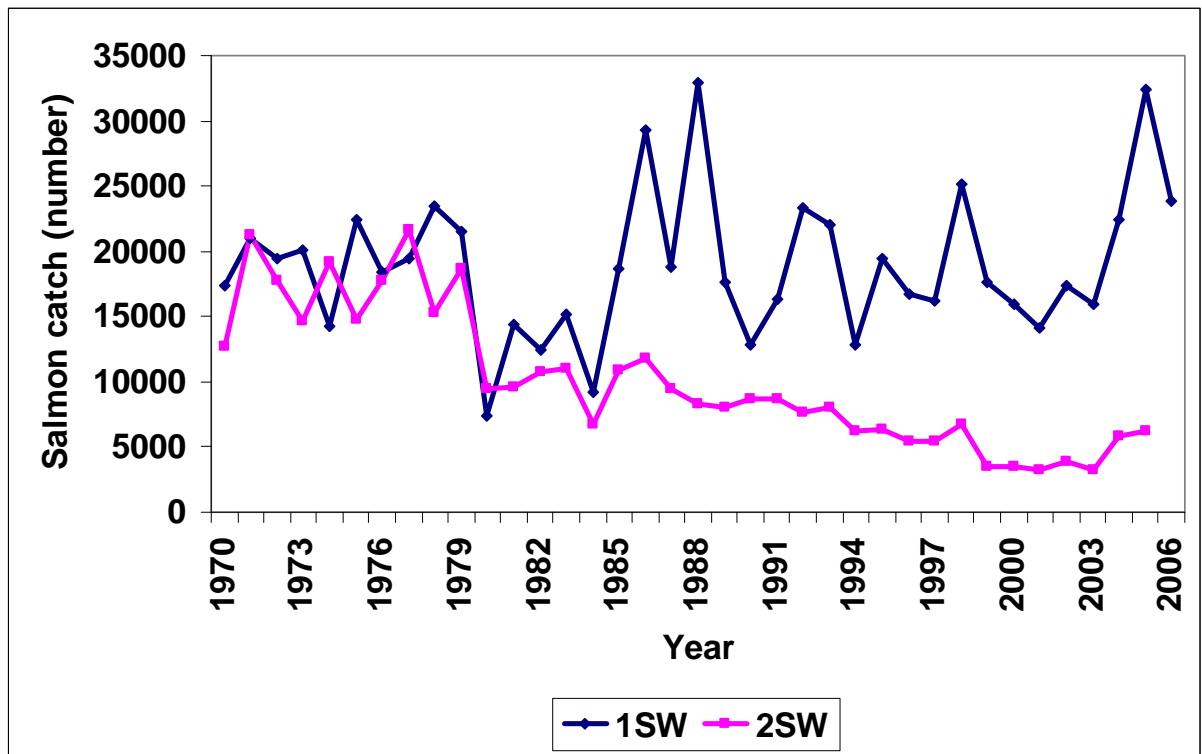
Rod catch in Icelandic rivers 1974-2007. The catch figures for 2007 are provisional. The rod catch figures include the catch in River Ranga, see below.



Net catch in Iceland 1974-2007. The catch figures for 2007 are provisional. Periods of net lease in River Hvita and buy-out of coastal fisheries are marked on the graph.



Rod catch in River Ranga. Angling fishery based almost entirely on releases of hatchery reared smolts.



Trends in sea age domposition of the rod catch in Icelandic rivers 1970-2006. The decline of the MSW salmon stock component is of major concerns. If the declining trend continues the MSW salmon will be close to extinction in 2020.



## Norway

| Commercial salmon fisheries (including heritage fisheries) and subsistence fisheries IN THE SEA   |               |   |
|---|---------------|---|
| Identification of Stakeholders  |               |   |
| holders   | Fishing right | Landowners along the coasts and fjords have the right to fish if it is opened for fishing and within the regulations set by the authorities   |
| other than fishing right holders  | Fishermen     | Yes, right holders might lease out their right to fish to others. Number n/a  |
| fishing related industries  | Commercial    | Small, mostly none, some local smokehouses. Suppliers of small boats and gear. No estimates are available.  |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) |               | Fishing right belongs to the landowner. On public land (such as in most of Finnmark in Northern Norway), there is a system with leasing of places to fish for salmon.   |
| fishermen including trends  | Number of     | 2006: 1380 active fishers*<br>2002: 1805 active fishers<br>1998: 1905 active fishers<br>* Buy out Trondheim fjord reduced with 100 fishers  |
| characteristics of fishermen: e.g. age, gender  | Demographic   | Male, middle-aged – old   |
| CPUE, (mean annual reported catch)  | Catch,        | <b>2007: 426 tonnes (94 000 fish),</b><br><b>2006: 512 tonnes (128 000 fish),</b><br><b>estimated 20 % escaped farmed salmon</b><br><b>2005: 466 tonnes (115 000 fish)</b><br><b>CPUE (bagnet per day): 1,02 (1sw) 1,33 (2sw), 0,27 (3+ sw),</b><br><b>CPUE (bendnet per day: 0,72 (below 3 kg), 0,86 (3 – 7 kgs), 0,29 (above 7 kgs)</b> |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements,   |               | Market price for wild salmon varies, but is   |

|  |            |   |
|--|------------|---|
| comparison with value of farmed salmon)                              |            | considered to be in the range of NOK 30 – 60 per kg, depending on size, quality, location/nearness to market. A larger buy-out project in Trondheim 2005 – 2009 has agreed on a price of NOK 70,-/kg. |
| gear in use, number of gear  | Type(s) of | Two types of gear are in use:<br>Bag nets (Kilenot), along all of Norway. Total nets number of nets: 1283 (2006)<br>Bend nets (Krokgarn), allowed only in Finnmark. Total number of nets: 685 (2006)  |
| Costs associated with the activity                                   |            | From Krokan (1997).   |
| Motivations for fishing ...(important for combined types of fishing) |            | This fishing is a combination of commercial, subsistence and recreational fishing.  |
| Comments   |            | There is also a regular autumn salmon fishery in several regions directed towards escaped farmed salmon, but rather few participates in this.   |

| Commercial salmon fisheries (including heritage fisheries) and subsistence fisheries IN RIVERS |               |   |
|--|---------------|---|
| Identification of Stakeholders   |               | Fishing right holder  |
| holders  | Fishing right | Fishing with traps, nets and cages is currently allowed in four Norwegian rivers: Tana river, Neiden river (Finnmark), Numedalslågen river (Vestfold) and Mandal river (Vest-Agder). The fishing in Tana and Neiden are for a significant part old saami/skolte/kven subsistence practices. |
| other than fishing right holders   | Fishermen     | Families, and some (few) tourists/visitors  |
| fishing related industries   | Commercial    | Mostly none, except for local smokehouses and some tourism in Numedal, Tana and Neiden  |

|   |             |  |
|---|-------------|--|
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) |             | Net and trap fishing in rivers was with the above exceptions closed down during the 1970s. Private rights. Landowners and/or farmers.  |
| fishermen including trends  | Number of   | Unknown  |
| characteristics of fishermen: e.g. age, gender  | Demographic | Male, middle-aged – old  |
| CPUE, (mean annual reported catch)  | Catch,      | <b>2006: estimated 30 000 kgs or 7500 fish, CPUE not available</b>   |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon)           |             | Market price for wild salmon varies, but is considered to be in the range of NOK 30 – 60 per kg, depending on size, quality, location/nearness to market.  |
| gear in use, number of gear   | Type(s) of  | River specific:<br><b>Numedal:</b> Nets, Traps: Annually between 2000 and 9000 kgs 2002 – 2006, 10 – 40 % of overall catch.<br><b>Neiden:</b> One seine net in a specific waterfall, annual catch 1000 – 3000 kgs 2002 - 2006.<br><b>Tana (Norway):</b> Driftnets: 16 %, Weirs: 29 %, Gillnets: 10 %, of average total catch 40 000 kg or 10000 salmon each year 2004 - 2007<br><b>Mandal:</b> One seine on lower parts, annual quota 500 kgs (2006 – 2008). |
| Costs associated with the activity  |             | No estimates are available.  |
| Motivations for fishing ...(important for combined types of fishing)  |             | Fishing is done for subsistence, food, recreational, tourist, and cultural heritage reasons, and for taking care of fishing rights, commercial aspects reduced   |
| Number of jobs/business   |             | n/a  |

#### Recreational salmon fisheries IN RIVERS

|  |  |
|--|--|
| Identification of main stakeholders  |  |
| Fishing right holders  | Riparian owners along the rivers, private and public owners. On some northern rivers all local inhabitants have the right to rod fishing.  |
| Fishermen  | Local, regional, national and international anglers and angling clubs  |
| Sport fishing related industries   | Tackle, travel, licences sales   |
| Guiding  | Little compared to for instance Scotland, but growing, no estimates  |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   | Significant in many districts but no   |
| Sport fishing equipment producers and retailers  | Significant at national and regional level. No specific statistics exists on salmon fishing tackle gross value, but general sport fishing tackle accounts for about 10 % of the overall sales in Sport shops in Norway |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | Privately owned fishing right. The basis for fisheries regulation is The act relating to salmonids and fresh-water fish etc.   |
| Number of rivers   | 445 according to NASCO statistics of which appr. 380 are fished  |
| Number of fishermen  | Estimates based on public fishing fee: 100.000 anglers   |
| Number of fishing days   | Rough estimates: 10 days per angler = 1.000.000 angling days   |
| Demographic characteristics: e.g. age, gender  | Middle aged males dominate   |
| Catch, CPUE, mean annual reported catch  | 2006: 499 tonnes (225 000 fish), 2007: 412 tonnes (172 000 fish)<br>CPUE: 1 salmon per 5 angling days, however, great variation between rivers and tackle. Case studies exist as well.                                 |
| Market value (e.g. of catch, including trends, fishing rights)   | Gross expenditures Euro 150 mill (2002 estimate, believed not changed much)  |
| Gear in use, preferences of gear   | Spoon, worm and fly. Fly fishing increases and soon dominate on most attractive rivers   |

|  |  |
|--|--|
| Types of fishing licensing – prices, indicators                                      | State licence: Every salmon angler needs a state licence.<br>Private permit: Also needed either fishing on private or public land.<br>Salmon fishing is rented out either as ticket water, as weekly packages (beats), or season rental of beats. It is believed that weekly fishing packages is growing on the costs of the other forms of rental |
| Costs connected with the activities  | River based surveys exist giving average value estimates for angler expenditures: Details can be provided  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | Case studies in a number of rivers during different years focussing on different aspects of use and non-use values, however many are several years old. Details can be provided when specific purpose for use is known.  |
| Motivation   | Varied, focussed on recreation, leisure  |
| Magnitude of and attitude towards Catch & Release                                    | n/a, generally little but growing somewhat, variations between rivers and angler groups. Generally, 100 % C&R not popular, but C&R as part of quota acceptable. Foreigners and fly anglers more positive.  |
| Number of businesses/number of jobs created by /depending on a salmon fishery        | Estimates based on gross income indicate jobs in the range of 2900 FT job equivalents for all of Norway  |

| <b>Recreational salmon fisheries IN SEA</b>  |  |
|--|--|
| Identification of main stakeholders  | Sport fishers, fishing clubs, coastal boat owners      |
| Fishing right holders  | Open access fishery                                    |
| Fishermen  | Recreational fishers, from shore and boat              |
| Sport fishing related industries   | Fishing tackle and leisure boating                     |
| Guiding  | Little, n/a  |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   | Little, n/a  |
| Sport fishing equipment producers and retailers  | Little, n/a  |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | Open access, no licencing, no system for catch reports |
| Number of fishermen  | Estimates based on national recreation surveys are     |

|  |  |
|--|--|
|  | inaccurate and too high (case studies do not confirm them), and number of fishers have probably been reduced much last three decades. No distinction made between sea trout and salmon fisheries in these estimates, and this fishing is supposed to be directed more towards sea-trout. Taken this uncertainty into account, a crude estimate of total number of salmon and sea trout anglers should be in the range 50.000 – 70.000 anglers. |
| Number of fishing days   | n/a  |
| Demographic characteristics: e.g. age, gender  | Middle aged males, some younger targeting sea trout on fly fishing   |
| Catch, CPUE, mean annual reported catch  | n/a  |
| Market value (e.g. of catch, including trends, fishing rights)                       | n/a  |
| Gear in use, preferences of gear   | Trolling from boat, fly fishing and spinning from shore.   |
| Types of fishing licensing – prices, indicators                                      | No licence needed  |
| Costs connected with the activities  | n/a  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | n/a  |
| Motivation   | n/a – recreation, leisure  |
| Magnitude of and attitude towards Catch & Release                                    | n/a  |
| Number of businesses/number of jobs created by /depending on a salmon fishery        | n/a  |

| NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity |             |  |
|--|-------------|--|
| of non-consumptive uses  | Description | <u>Three visitor centres focussing on wild salmon:</u> <ul style="list-style-type: none"> <li>- Norsk villakssenter in Lærdal (annually 20 – 25.000 visitors, income range NOK 1,7 mill/year)</li> <li>- Namsen salmon aquarium in Grong (annually 25 – 30.000 visitors, income range NOK 1,2 mill/year)</li> <li>- Gaula Natursenter, Støren: (annually +30.000 visitors, free entrance)</li> </ul> |

|  |  |
|--|--|
|  | <p>Several <u>organised or unorganised viewing locations</u>:</p> <ul style="list-style-type: none"> <li>- Målselvfossen (fish ladder) entrance fee NOK 30,- (no visitor counts)</li> <li>- Sandsfossen, Suldal (fish ladder and counter)</li> <li>- Egga fossen, Gaula</li> <li>- Støvelsfossen, Stordalselva, Fosen</li> <li>- Kjerrafossen Numedal</li> <li>- Hellefossen, Drammen</li> <li>- Steinsdal river, Fosen</li> </ul> <p><u>Salmon diving</u>:</p> <ul style="list-style-type: none"> <li>- a few tourist operators offer scuba diving/river floats viewing salmon</li> <li>- Suldal – Mo Laksegård, Winsnes in Gaula, probably other places as well</li> </ul> <p><u>“Salmon Festivals”</u>:</p> <ul style="list-style-type: none"> <li>- Several places arrange festivals and markets related to salmon. Their orientation towards salmon varies; some might have a fishing competition, others have a seminar, while some just use the name “salmon” in a festival focussing on concerts, shopping and fun. Norwegian River Owners Organisation launches “National Wild Salmon Day 21 June as a day for wild salmon activities.</li> </ul> |
|--|--|

|  |           |   |
|--|-----------|---|
|  |           | Visitor centres: A mix of round trip tourists (mostly foreign) and anglers  |
| connected with the activities  | Costs     | Entrance fee Namsen: NOK 70,- / 50,- (groups)/ 40,- (children)<br>Entrance fee Lærdal: n/a<br>Entrance fee Gaula: Free access to exhibition<br>Entrance fee Målselv: NOK 30,- |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) |           | n/a   |
| n  | Motivatio | Mixed; nature studies, wildlife viewing, general nature experience  |
| Number of businesses/number of jobs created/depending these activities               |           | Namsen: 3 – 4 part time jobs<br>Lærdal: 3 – 5 part time jobs<br>Gaula: 2 full time jobs and 3 – 4 part time jobs  |

| Existence of salmon  |  |  |
|--|--|--|
| Main stakeholders  |  |  |
| General public also including Fishing right holders, Fishermen and Fishing related industries              |  | General public, tourists at sites/destinations, students, school children  |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) |  | Case studies exist but no updated, or overall for wild salmon for all of Norway. Existing studies might be applicable for more specific studies if adapted and updated |

| Social ceremonial and cultural aspects  |  |   |
|---|--|---|
| Main stakeholders   |  |   |
| Indigenous people (Sami people, first nations...)   |  | See above on commercial and subsistence fisheries |
| People carrying out historic fishing activities   |  | See above on commercial and subsistence fisheries |
| General public also including Fishing right holders, Fishermen and Fishing related industries |  |   |
| Description and magnitude of the uses   |  | n/a   |
| Number of users   |  | n/a   |



|  |     |
|--|-----|
| Demographic characteristics: e.g. age, gender  | n/a |
| Costs connected with the activities  | n/a |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | n/a |
| Motivation   | n/a |
| Number of businesses/number of jobs created/depending these activities               | n/a |

| <b>Environmental aspects with particular reference to biodiversity value</b>   |  |
|--|--|
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | n/a  |
| Genetic reserve for aquaculture  | A gene bank is operated in Norway for conservation purposes – costs associated with program this can be provided if needed |
| Genetic reserve for the survival of the species under changing (climate) conditions  | See above  |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | n/a  |

## Russian Federation

| Commercial salmon fisheries   |  |
|---|--|
| Identification of Stakeholders  |  |
| Fishing right holders   | There are a number of identified fishing right holders in each region. A fishing right holder is allocated a fishing site on the basis of agreement with the state fisheries management authorities. Each fishing right holder is allocated a fixed percentage of the total commercial quota set for a region on an annual basis. The percentage is subject to revision every 10 years.  |
| Fishermen other than fishing right holders  | No   |
| Commercial fishing related industries   | There are related industries, but no estimates are available.  |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) | Legal basis for fishery is the Federal Law on Fisheries # 166-FZ, 2004. Quota for the commercial fishery is set annually by the Russian Government on the region-by-region basis and then allocated to the fishing right holders in accordance with their fixed percentages. The allocated quota can be only used within an allocated fishing site. The fishing is conducted in accordance with the fishery regulations for the North Russia fishery basin (Order of the Ministry of Agriculture # 245, 2007). |
| Number of fishermen including trends  | There were 153 fishermen in Murmansk region and 141 fishermen in Archanglesk region in 2007, which was at the same level as in previous 5 years and slightly less than the average for previous 10 years. In 2006 there were 15 fishermen on the Pechora river.  |
| Demographic characteristics of fishermen: e.g. age, gender  | Males 25-60. 90% over 40.  |
| Catch, CPUE, (mean annual reported catch)   | Catch statistics is available for all regions since 1960. Commercial catches declined drastically from about 600 tonnes in 1980 <sup>th</sup> to about 60 tonnes in recent years. 20 tonnes were harvested in Murmansk region and 14 tonnes in Archanglesk region in 2007. This reduction  |

|   |   |
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|   | was mostly due to implemented management measures including prohibition of some important in-river fisheries, aimed at reducing the commercial fishing effort and enhancing the development of recreational fisheries. CPUE data is available for commercial fisheries in Archangelsk region. It shows a slight decline over the last 10 years for coastal fishery and no trend for in-river fishery.   |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon) | One kilo of wild salmon costs on the market approximately the same price as farmed salmon - 250 RUB (10 USD). The market value of commercial catch in 2007 can be estimated as 8,5M RUB (340K USD)  |
| Type(s) of gear in use, number of gear  | A trap net is the most common gear used in the fishery now. There's no commercial in-river fishery in Murmansk region since 2004 whereas 10-15 barrier fences were in operation annually on the largest rivers before. The effort on in-river commercial fishery in the Archangelsk region shows a decline over the last 10 years from 200-300 gear down to 60-70 (24 in 2007) while the effort in the coastal fishery in the White sea shows no trend for the time series available (60-90 gear in use). |
| Costs associated with the activity  | No estimates are available.   |
| Motivations for fishing ...(important for combined types of fishing)  | This fishery is viewed more as a social measure – a traditional way of fishing by indigenous people from Pomor villages along the White sea coast.  |
| Profitability   | No estimates are available.   |
| <b>Recreational salmon fisheries</b>  |   |
| Identification of main stakeholders   |   |
| Fishing right holders   | There are a number of identified fishing right holders in each region. A fishing right holder is allocated a fishing site where recreational fishing is organised on the basis of quota allocated annually.   |

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| Fishermen  | There are two major groups of fishermen: anglers (tourists) buying trips from fishing right holders and fishermen buying only a fishing licence. Last group includes fishermen who go fishing for food only.  |
| Sport fishing related industries   |   |
| Guiding  | Services are provided, but there are no estimates available.  |
| Tourist businesses and local/rural service businesses (grocery, fuel...)   | Services are provided, but there are no estimates available.  |
| Sport fishing equipment producers and retailers  | Services are provided, but there are no estimates available.  |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | Legal basis for fishery is the Federal Law on Fisheries # 166-FZ, 2004. Quota for the recreational fishery is set annually by the Russian Government on a region-by-region basis and then allocated to the fishing right holders by regional administrations. The allocated quota can only be used within an allocated fishing site. The fishing is conducted in accordance with the fishery regulations for the North Russia fishery basin (Order of the Ministry of Agriculture # 245, 2007). |
| Number of rivers   | There are 79 salmon rivers in Murmansk region, 18 rivers in Karelia and 23 in Archangelsk region.   |
| Number of fishermen  | In 2007 there were about 2,000 foreign and 3,500 Russian anglers who bought fishing trips and approximately 10,000 Russian (mostly local) anglers, who bought fishing licences.   |
| Number of fishing days   | Over 20,000 fishing days in 2007 (catch-and-release only) which was 30% higher then the average for previous 10 years.  |
| Demographic characteristics: e.g. age, gender  | n/a   |
| Catch, CPUE, mean annual reported catch  | Catch statistics is available for Murmansk region for 1991-2007. Over 44,000 fish (catch-and-release) were reported in 2007, which was twice as much as the average for the previous 10 years. CPUE data are  |

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|  | available for a number of rivers for 1991-2007. About 5,000 fish were reported for catch-and-retain fishing in 2007, which was at the same level as the mean for the previous 10 years.  |
| Market value (e.g. of catch, including trends, fishing rights)                       | The total investments into infrastructure of the recreational fishery in Murmansk region is roughly estimated to be over 25 millions USD. The investments in 2007 were over 2.5 millions USD.  |
| Gear in use, preferences of gear   | Fly rod in catch-and-release, spinning rod in catch-and-retain. Gill nets on the Pechora river.  |
| Types of fishing licensing – prices, indicators                                      | There are licences or fishing permits for both catch-and-release and catch-and-retain fishing. The lowest price for one-day (half-day) bag limit permit for catch-and-retain can be as low as 10 USD per fish. The average price was about 20 USD in 2007. The price for one-day (half-day) non-bag limit permit for catch-and-release was slightly higher.<br>The fishing trip price varies from 1,000 USD to 20,000 USD per week, and includes the cost of fishing permit. |
| Costs connected with the activities  | n/a  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | Demand is higher than what the fishery can sustain. Willingness to pay is high, but there are no estimates available.  |
| Motivation   | The recreational salmon fishery in the Russia's Kola Peninsula (Murmansk region) today is seen as one of the most prestigious in the North Atlantic, because of the quality of fishing. Local people go fishing for food.  |
| Magnitude of and attitude towards Catch & Release                                    | Around 80% of the total rod catch are released annually. The development of recreational fishing in Russia has been based on catch-and-release principle and this has been accepted by foreign anglers and now, increasingly, by Russian anglers. The system of allocating a catch-and-retain harvest to local fishermen, in addition to the catch-and-release fishery, seems to work well.  |

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| Number of businesses/number of jobs created by /depending on a salmon fishery | 10 companies were organizing recreational fishery in 2007 in Murmansk region. Number of full time employees – 119, number of part time employees – 264. |
|---|---|

| <b>NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity</b> |  |
|---|--|
| Description of non-consumptive uses   | There is a diving centre on the Keret river. Major activity is diving in the White sea but some go diving in the river to see salmon. There are over 20 guesthouses and camping along the sea shore in Republic of Karelia for tourists. |
| Demographic characteristics: e.g. age, gender of users  | n/a  |
| Costs connected with the activities   | n/a  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)                      | Willingness to pay is high, but there are no estimates available.  |
| Motivation  | To see wild salmon in natural environment. Wilderness of the environment.  |
| Number of businesses/number of jobs created/depending these activities                                    | 1 diving centre and over 20 guesthouses and camping in the Republic of Karelia. Number of employees – around 200.  |

| <b>Existence of salmon</b>   |     |
|--|-----|
| Main stakeholders  | n/a |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | n/a |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | n/a |

| <b>Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries</b> |   |
|---|---|
| Main stakeholders   | n/a   |
| Indigenous people (Sami people, first nations...)                           | First nations of the North have rights to carry out subsistence fishery. Legal basis for fishery is the Federal Law on Fisheries # 166-FZ, 2004. Quota for the subsistence fishery is set annually by the Russian |

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|  | Government on the region-by-region basis and then allocated to the First nations by regional administrations. No quota has been utilized since 2004 when the Federal Law came into force.   |
| People carrying out historic fishing activities  | Indigenous people from Pomor villages along the White sea coast. This group has no rights for subsistence fishery but has been allocated fishing sites and quotas for commercial fishery on the basis of historic fishing activities. |
| <b>Environmental aspects with particular reference to biodiversity value</b>   |   |
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | Atlantic salmon in Russia is recognised as an indicator of clean environment.   |
| Genetic reserve for aquaculture  | Most of rivers have genetically unpolluted wild Atlantic salmon populations.  |
| Genetic reserve for the survival of the species under changing (climate) conditions  | Most of rivers have genetically unpolluted wild Atlantic salmon populations.  |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | n/a   |

## USA

| <b>Commercial salmon fisheries –Section not applicable to the United States</b>   |  |
|---|--|
| Identification of Stakeholders  |  |
| Fishing right holders   |  |
| Fishermen other than fishing right holders  |  |
| Commercial fishing related industries   |  |
| Legal basis for commercial fisheries, fisheries regulations (e.g. public or private; if public, whether they are open-access or restricted) |  |
| Number of fishermen including trends  |  |
| Demographic characteristics of fishermen: e.g. age, gender  |  |
| Catch, CPUE, (mean annual reported catch)   |  |
| Market value (e.g. of catch, including trends, fishing rights, compensation arrangements, comparison with value of farmed salmon)           |  |
| Type(s) of gear in use, number of gear  |  |
| Costs associated with the activity  |  |
| Motivations for fishing ...(important for combined types of fishing)  |  |
| Profitability   |  |

| <b>Recreational salmon fisheries</b>                                     |  |
|--|--|
| Identification of main stakeholders                                      |  |
| Fishing right holders  | Not Applicable   |
| Fishermen  | The recreational fisheries for Atlantic salmon are small in scale and very limited. Therefore, fishermen that participate in the limited Atlantic salmon recreational fishery opportunities in the US likely primarily target other species. |
| Sport fishing related industries   | Due to the small scale and limited nature of the Atlantic salmon recreational fishery opportunities in the US, sport related industries primarily rely on other target species.  |
| Guiding  | There are no known guiding businesses for any Atlantic salmon recreational fisheries in the US.  |
| Tourist businesses and local/rural service businesses (grocery, fuel...) | Due to the small scale and limited nature of the Atlantic salmon   |



|  |   |
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|  | recreational fishing opportunities in the US, tourist industries primarily rely on other target species. The fishery recently implemented in the Penobscot River did attract some out of state residents; however, it was a small number of individuals. The fisheries on excess broodstock from the Connecticut and Merrimack River restoration programs are very popular.   |
| Sport fishing equipment producers and retailers  | Due to the small scale and limited nature of the Atlantic salmon recreational fishery opportunities in the US, sport related industries primarily rely on other target species.   |
| Legal basis for recreational fisheries, fisheries regulations, (e.g. public or private; if public, whether they are open-access or restricted) | The New Hampshire Fish and Game Department manages the Atlantic salmon broodstock fishery in the mainstem of the Merrimack River and lower portion of the Pemigewasset River. The Connecticut Department of Environmental Protection, Bureau of Natural Resources Inland Fisheries Division manages the recreational salmon fisheries in the Shetucket and Naugatuck rivers. Lastly, in Maine the Maine Department of Marine Resources Bureau of Sea Run Fisheries manages the catch and release fishery. The Gulf of Maine (GOM) Distinct Population Segment (DSP) is protected under federal law (i.e., the Endangered Species Act). Therefore, for the populations in the GOM DPS, federal law prohibits all recreational fishing. |
| Number of rivers   | New Hampshire: Merrimack and Pemigewasset Rivers. (broodstock fishery)<br><br>Connecticut: The Naugatuck and Shetucket Rivers. (broodstock fishery)<br><br>Maine: Penobscot River (sea-run fishery)   |
| Number of fishermen  | Proxy based on licenses sold.<br><br>New Hampshire: Merrimack and Pemigewasset Rivers<br>1,447 licenses sold in 2006<br>1,395 Licenses sold in 2007   |

|                        |   |
|------------------------|---|
|                        | <p>Connecticut: No data available</p> <p>Maine: Penobscot River - In 2006, 241 Licenses sold, 147 anglers complied with reporting requirements, and there were 247 angler trips reported</p> <p>In 2007, 90 Licenses sold, approximately 30 anglers complied with reporting requirements, and 83 angler trips were reported.</p>  |
| Number of fishing days | <p>Data available on days only.</p> <p>New Hampshire: Merrimack and Pemigewasset Rivers creel limits are one fish per day, five fish per season with a minimum length of 15 inches. The season is open all year for taking salmon with a catch and release season from 1 October to 31 March.</p> <p>Connecticut: For the Shetucket and Naugatuck rivers from October 1 to March 31, angling for all species in the salmon broodstock areas is restricted to fishing methods that are legal for Atlantic salmon. Creel limits for these rivers are -<br/> December 1, 2007 through March 31, 2008 ONE (1) SALMON PER DAY; April 1, 2008 to 6:00 am, April 19, 2008 Salmon fishing closed; April 19, 2008 through September 30, 2008 ONE (1) SALMON PER DAY (6:00 am-opening day); October 1, 2008 through November 30, 2008 CATCH AND RELEASE ONLY<br/> December 1, 2008 through March 31, 2009 ONE (1) SALMON PER DAY.</p> <p>Maine: In the Penobscot River the fishery is 30 days (season open Sept 15-Oct 15 unless water temperatures exceed 68°F); additional spring fishery authorized for May 2008 (30 days)</p> |

|   |  |
|---|--|
| <p>Demographic characteristics: e.g. age, gender</p>                  | <p>New Hampshire: In Spring 2007, 479 (age 3 and 4) domestic broodstock were released for the fishery. In Fall 2007, an additional 1,081 (age 2) broodstock were released for a combined total release of 1,560 fish to support the fishery in the main stem of the Merrimack River and the lower portion of the Pemigewasset River.</p> <p>Connecticut: The Department of Environmental Protections stocks broodstock that are typically two to five years old and weigh from 2 to 20 pounds.</p> <p>Maine: In the Penobscot River, of the 916 sea-run salmon returning to the trap in 2007, 260 were 1 sea winter (1SW) fish, or 28% of the total run. Most of the U.S. origin salmon spend 2 winters at sea, between 1967-2003 approximately 10% wild/ naturally reared origin adults were grilse and 86% were 2 sea winter. The grilse rate for the Penobscot did increase in the 1970s.</p> |
| <p>Catch, CPUE, mean annual reported catch</p>                        | <p>No data are available on the reported catch for the fisheries in Connecticut and New Hampshire. However, it is known that in these fisheries, broodstock are killed and kept for consumption.</p> <p>Maine: In 2006 in the fishery on the Penobscot River, anglers had the opportunity to fish over at least 29 Atlantic salmon based on the catch of salmon at the Veazie trap. One Atlantic salmon was captured and released just after 7 a.m. on September 27th and an additional 14 Atlantic salmon raised/observed. In 2007, a total of 83 angler trips were reported. Anglers had the opportunity to fish over at least 31 Atlantic salmon based on the catch of salmon at the Veazie trap. Three Atlantic salmon were captured and released and an additional 10 Atlantic salmon raised/observed.</p>  |
| <p>Market value (e.g. of catch, including trends, fishing rights)</p> | <p>There is no real market value associated with the recreational</p>  |

|   |  |
|---|--|
|   | <p>fisheries for Atlantic salmon in the US as they are currently being executed given that they are very small in scale and limited.</p>   |
| Gear in use, preferences of gear                | <p>Connecticut: Fishing for Atlantic salmon is limited to use of a SINGLE FLY or artificial LURE WITH A SINGLE FREE-SWINGING HOOK. Additional weight may not be added to the line.<br/>Snagging is strictly prohibited.</p> <p>New Hampshire: The required gear is described by the following definitions and regulations. "Fly-fishing" means casting with only fly rod, fly reel and fly line combination with an artificial fly attached, to which no additional weight has been added to the fly line or leader, and does not include the use of spinning, spincast, and casting rods and reels and lead core lines.</p> <p>A fly shall be a single- or double-pointed hook, unweighted, and shall not be baited. A fly is defined as a hook dressed with feathers, hair, thread, tinsel or any similar material to which no spinner, spoon or similar device is added. The fly is unweighted if the material is added to the fly as an attractant only and will not make the fly sink.</p> <p>Maine: Only catch and release angling was allowed. Any salmon hooked had to be released immediately, without injury; No salmon shall be removed from the water for any reason; Fly fishing only (fly must be tied on single pointed barbless hook); and only one fly or hook can be fished at any one time.</p> |
| Types of fishing licensing – prices, indicators | <p>New Hampshire: Recreational salmon license costs \$11 US.</p> <p>Connecticut: Recreational Licenses for Inland Fisheries range</p>  |

|  |  |
|--|--|
|  | <p>from \$20 to \$40 US depending on resident status.</p> <p>Main: Permit cost is \$15 US</p>  |
| Costs connected with the activities  | No data  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay) | <p>The USFWS and NMFS are required to assess the economic impacts of critical habitat designation. As a result, the NMFS used data gathered as part of that process on willingness to pay. Given that the economic impacts being assessed were in relation to critical habitat, the information below does not represent an extensive analysis of the economic benefits and costs of recreational fisheries. However, it does present a general idea of what the willingness to pay may be in the US.</p> <p>Recreational fishing value is measured in willingness to pay for the opportunity to fish which can be evaluated using stated preference techniques or revealed preferences techniques. Revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities (i.e., people "reveal" the value they hold for an amenity by their behavior). Travel cost models are one way to assess an individual's willingness to pay for fishing opportunity as well as random utility models and property value models.</p> <p>Kay et al. (1987) funded by the USFWS, was one of the most relevant studies that assessed the cost-effectiveness of a range of alternatives for continued implementation of the Service's Atlantic Salmon Restoration Program. The study estimates that annual willingness to pay for an Atlantic salmon fishing license ranges from \$35.87 for those who might fish to \$50.78 for those who will certainly fish. Separate from these use values, the study reports that willingness to pay for Atlantic salmon restoration (a one-time payment) ranges from \$17.20 to \$50.79 per household. Kay, et al. also develop aggregate benefit results, applying the individual willingness to pay figures to estimates of the total number of households in New England;</p> |

|   |   |
|---|---|
|   | <p>this yields a total economic value for the Atlantic Salmon Restoration Program of about \$129 million. IEC states that there are some problems with these results due in part to the methodology used to collect information. Therefore, in comparison with other angler value studies, the actual use values may be quite a bit higher.</p> <p>This study, however, is more than 20 years old and is based on methods that may not produce reliable estimates. In light of these considerations, a transfer of the results of the Kay, et al. study to estimate the benefits of efforts to protect and restore the Gulf of Maine DPS of Atlantic salmon is not justified.</p>   |
| Motivation  | <p>The motivation for all three of the fisheries discussed in Maine, New Hampshire, and Connecticut is recreational entertainment and opportunity to engage in recreational fisheries in general.</p>   |
| Magnitude of and attitude towards Catch & Release | <p>Catch and release fishing is widely accepted and practiced. As noted in previous sections, catch and release is required in Maine and in some Connecticut fisheries and at certain times of the year in New Hampshire.</p> <p>With respect to motivation, information is limited. Permit sale information is provided as a proxy although it covers both kill and catch and release fisheries.</p> <p>New Hampshire: Permit sales have remained steady in recent years, with a slight increase from 1,395 sold in 2006 to 1,446 in 2006. Data from the 2007 season is not yet available. Permit sales suggest that anglers continue to value this unique opportunity to fish for Atlantic salmon in northern New England.</p> <p>Connecticut: No permit data could be found; however, the broodstock fishery seems to continue to be supported by angler participation on an annual basis.</p> |

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|   | <p>Maine- License sales declined from 2006 to 2007. According to anglers this decrease in participation is attributed to a desire to have the State authorize a spring fishery. The State did authorize a spring fishery this past winter for the spring of 2008. It is difficult to predict if angler participation would have increased once again in the fall had the spring fishery not been authorized.</p> |
| Number of businesses/number of jobs created by /depending on a salmon fishery | There are no businesses or jobs that depend on Atlantic salmon recreational fisheries in the U.S.  |

| <b>NON-consumptive uses – salmon watching/Visitor centres ... description, magnitude of each activity</b> |   |
|---|---|
| Description of non-consumptive uses   | Visits to viewing windows at fishways, visits to hatcheries   |
| Demographic characteristics: e.g. age, gender of users  | Variety, families, school groups  |
| Costs connected with the activities   | Unlikely that there are any costs associated with these public outreach opportunities.  |
| Willingness to pay (if possible, divided into marginal and total willingness to pay)                      | No data.  |
| Motivation  | No data.  |
| Number of businesses/number of jobs created/depending these activities                                    | While Federal and State agencies, as well as Non governmental organizations do engage in public outreach, it is not the sole mission of any of these entities. The mission of these entities is largely salmon recovery and restoration, thus public outreach is just one element of this overall mission. As a result, no businesses/ jobs rely on these activities. |

| <b>Existence of salmon</b>   |  |
|--|--|
| Main stakeholders  |  |
| General public also including Fishing right holders, Fishermen and Fishing related industries              | Citizens of Maine, New Hampshire, and Connecticut specifically. However, salmon restoration and recovery are an issue of national interest in the US given that the populations in Maine represents the last remnant populations of wild Atlantic salmon in the US. Conservation and sportsmen groups are also typical stakeholders that have an interest in recreational fisheries. |
| Willingness to pay by the general public (if possible, divided into marginal and total willingness to pay) | No data  |



| <b>Food, Social, Ceremonial, Cultural aspects and Subsistence fisheries</b>  |   |
|--|---|
| Main stakeholders  |   |
| Indigenous people (Sami people, first nations...)  | The Penobscot Indian Nation and Passamaquoddy tribes both have tribal rights to fish for salmon in the Penobscot River for ceremonial and subsistence purposes. However, the tribes in Maine have chosen not to exercise that right in recent years due to concerns over the conservation status of the population in the Penobscot River.  |
| People carrying out historic fishing activities  | Citizens of the State of Maine have strong cultural connection to Atlantic salmon; Viable fisheries will help maintain this connection, which is critical to recovering the species. However, to date there is no data to show the relationship between providing a fishery opportunity in Maine and increased desire to support recovery efforts.  |
| <b>Environmental aspects with particular reference to biodiversity value</b>   |   |
| Indicator/icon of sound environment, indicator for environmental changes such as the climate   | Species listed under the Endangered Species Act are identified as national priorities for conservation and recovery. The goal of the ESA is to recover the ecosystems upon which listed species depend – so recovery of Atlantic salmon will benefit a wide range of species through the restoration of ecosystem function.   |
| Genetic reserve for aquaculture  | No information.   |
| Genetic reserve for the survival of the species under changing (climate) conditions  | There are a number of federal hatcheries used for artificial propagation of Atlantic salmon for recovery and restoration purposes. These hatcheries represent a genetic reserve in the event of a catastrophic event.   |
| Value and impacts of listing salmon, e.g. under EU Habitats Directive, US Endangered Species Act, Canadian Species at Risk Act, etc. | Federal agencies are prohibited from undertaking, permitting, or funding any activity that will jeopardize the continued existence of a listed species. Funds are expended annually by federal agencies and industries, individuals and entities to modify projects and implement conditions to avoid, minimize or mitigate impacts to listed Atlantic salmon and their habitat. In addition, approximately \$10 million is spent directly annually to protect and recover Atlantic salmon. |

## Canada

### Number of Salmon Anglers

|               | 2000     | 2005     | 2000                         | 2005                         | 2000                      | 2005                      | 2000   | 2005   |
|---------------|----------|----------|------------------------------|------------------------------|---------------------------|---------------------------|--------|--------|
|               | Resident | Resident | Canadian<br>Non-<br>Resident | Canadian<br>Non-<br>Resident | Other<br>Non-<br>Resident | Other<br>Non-<br>Resident | Total  | Total  |
| Newfoundland  | 14,287   | 12,293   | 1,003                        | 1,034                        | 601                       | 519                       | 15,890 | 13,846 |
| PEI           | 241      | 366      | 18                           | 55                           | 17                        | 18                        | 276    | 439    |
| Nova Scotia   | 1,257    | 1,790    | 200                          | 287                          | 509                       | 465                       | 1,966  | 2,542  |
| New Brunswick | 12,777   | 11,183   | 1,410                        | 1,977                        | 3,512                     | 2,699                     | 17,698 | 15,859 |
| Quebec        | 10,415   | 7,654    | 417                          | 0                            | 929                       | 0                         | 11,761 | 7,654  |
| Total         | 38,976   | 33,286   | 3,048                        | 3,353                        | 5,567                     | 3,701                     | 47,592 | 40,340 |

### Number of Salmon Days Fished

|               | 2000     | 2005     | 2000                         | 2005                         | 2000                      | 2005                      | 2000    | 2005    |
|---------------|----------|----------|------------------------------|------------------------------|---------------------------|---------------------------|---------|---------|
|               | Resident | Resident | Canadian<br>Non-<br>Resident | Canadian<br>Non-<br>Resident | Other<br>Non-<br>Resident | Other<br>Non-<br>Resident | Total   | Total   |
| Newfoundland  | 170,210  | 153,284  | 5,720                        | 5,490                        | 3,501                     | 3,983                     | 179,431 | 162,757 |
| PEI           | 2,395    | 3,693    | 83                           | 150                          | 90                        | 50                        | 2,567   | 3,894   |
| Nova Scotia   | 17,059   | 15,912   | 814                          | 1,464                        | 3,225                     | 3,747                     | 21,099  | 21,123  |
| New Brunswick | 103,965  | 100,849  | 5,603                        | 7,624                        | 17,717                    | 16,913                    | 127,285 | 125,386 |
| Quebec        | 88,092   | 51,730   | 2,584                        | 0                            | 7,950                     | 0                         | 98,626  | 51,730  |
| Total         | 381,720  | 325,469  | 14,805                       | 14,728                       | 32,482                    | 24,693                    | 429,008 | 364,890 |

**Summary of Economic Contributions Attributable to Atlantic salmon**  
(angler must have fished at least one day for Atlantic salmon)

|   | 2000        |                         |                      |             |                                 |             | 2005        |                         |                      |            |                                 |
|---|-------------|-------------------------|----------------------|-------------|---------------------------------|-------------|-------------|-------------------------|----------------------|------------|---------------------------------|
|   | Resident-AS | Nonresident Canadian-AS | Nonresident Other-AS | Total AS    | Total-All anglers (all species) | % AS to All | Resident-AS | Nonresident Canadian-AS | Nonresident Other-AS | Total AS   | Total-All anglers (all species) |
| <b>Newfoundland</b>                       |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 15,097,630  | 41,021                  | 119,872              | 15,258,523  | 164,143,117                     | 9.3%        | 19,061,122  | 192,829                 | 24,771               | 19,278,722 | 207,729,6                       |
| Investment for recreational fishing       | 9,090,572   | 38,117                  | 94,406               | 9,223,095   | 64,306,014                      | 14.3%       | 9,232,258   | 82,737                  | 23,545               | 9,338,540  | 95,089,2                        |
| Total direct expenditures incl packages   | 4,861,850   | 1,777,860               | 1,614,195            | 8,253,906   | 42,994,814                      | 19.2%       | 6,082,040   | 1,632,434               | 1,406,994            | 9,121,468  | 18,242,9                        |
| Total expenditures                        | 19,959,481  | 1,818,881               | 1,734,067            | 23,512,429  | 207,137,931                     | 11.4%       | 25,143,162  | 1,825,263               | 1,431,765            | 28,400,190 | 225,972,5                       |
| Total attributable expenditures           | 13,952,423  | 1,815,977               | 1,708,601            | 17,477,001  | 107,300,828                     | 16.3%       | 15,314,298  | 1,715,171               | 1,430,539            | 18,460,008 | 113,332,2                       |
| % attributable to recreational fishing    | 69.9%       | 99.8%                   | 98.5%                | 74.3%       | 51.8%                           |             | 60.9%       | 94.0%                   | 99.9%                | 65.0%      | 50.1                            |
| <b>New Brunswick</b>                      |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 13,919,082  | 484,287                 | 561,476              | 14,964,844  | 58,027,587                      | 25.8%       | 9,767,333   | 148,823                 | 271,651              | 10,187,807 | 44,988,2                        |
| Investment for recreational fishing       | 7,133,247   | 179,831                 | 459,389              | 7,772,467   | 26,240,319                      | 29.6%       | 6,481,878   | 146,098                 | 270,688              | 6,898,664  | 24,689,4                        |
| Total direct expenditures incl packages   | 3,869,067   | 1,938,700               | 6,386,979            | 12,194,746  | 24,040,654                      | 50.7%       | 4,603,629   | 2,335,025               | 4,430,143            | 11,368,797 | 22,737,5                        |
| Total expenditures                        | 17,788,148  | 2,422,986               | 6,948,455            | 27,159,590  | 82,068,241                      | 33.1%       | 14,370,963  | 2,483,848               | 4,701,794            | 21,556,605 | 67,725,8                        |
| Total attributable expenditures           | 11,002,314  | 2,118,530               | 6,846,368            | 19,967,212  | 50,280,973                      | 39.7%       | 11,085,507  | 2,481,124               | 4,700,830            | 18,267,461 | 47,427,0                        |
| % attributable to recreational fishing    | 61.9%       | 87.4%                   | 98.5%                | 73.5%       | 61.3%                           |             | 77.1%       | 99.9%                   | 100.0%               | 84.7%      | 70.1                            |
| <b>Nova Scotia</b>                        |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 734,289     | 7,426                   | 22,514               | 764,229     | 71,749,196                      | 1.1%        | 1,252,829   | 759,527                 | 1,177,474            | 3,189,830  | 57,037,6                        |
| Investment for recreational fishing       | 491,587     | 6,412                   | 19,097               | 517,095     | 35,278,054                      | 1.5%        | 565,196     | 204,132                 | 888,661              | 1,657,989  | 31,251,7                        |
| Total direct expenditures incl packages   | 865,056     | 147,842                 | 636,268              | 1,649,167   | 21,411,676                      | 7.7%        | 609,637     | 238,657                 | 557,731              | 1,406,025  | 2,812,0                         |
| Total expenditures                        | 1,599,345   | 155,268                 | 658,782              | 2,413,396   | 93,160,872                      | 2.6%        | 1,862,466   | 998,185                 | 1,735,205            | 4,595,856  | 59,849,7                        |
| Total attributable expenditures           | 1,356,643   | 154,254                 | 655,365              | 2,166,262   | 56,689,730                      | 3.8%        | 1,174,833   | 442,789                 | 1,446,391            | 3,064,014  | 34,063,7                        |
| % attributable to recreational fishing    | 84.8%       | 99.3%                   | 99.5%                | 89.8%       | 60.9%                           |             | 63.1%       | 44.4%                   | 83.4%                | 66.7%      | 56.1                            |
| <b>Prince Edward Island</b>               |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 43,659      | 289                     | 1,659                | 45,606      | 2,638,371                       | 1.7%        | 144,063     | 24,953                  | 0                    | 169,016    | 4,068,8                         |
| Investment for recreational fishing       | 24,327      | 289                     | 1,026                | 25,642      | 1,633,054                       | 1.6%        | 58,931      | 2,891                   | 0                    | 61,822     | 2,431,8                         |
| Total direct expenditures incl packages   | 18,463      | 6,237                   | 10,338               | 35,038      | 2,018,181                       | 1.7%        | 58,238      | 17,318                  | 34,335               | 109,892    | 219,7                           |
| Total expenditures                        | 62,122      | 6,525                   | 11,997               | 80,645      | 4,656,552                       | 1.7%        | 202,301     | 42,272                  | 34,335               | 278,908    | 4,288,6                         |
| Total attributable expenditures           | 42,790      | 6,525                   | 11,364               | 60,680      | 3,651,235                       | 1.7%        | 117,170     | 20,209                  | 34,335               | 171,714    | 2,651,6                         |
| % attributable to recreational fishing    | 68.9%       | 100.0%                  | 94.7%                | 75.2%       | 78.4%                           |             | 57.9%       | 47.8%                   | 100.0%               | 61.6%      | 61.1                            |
| <b>Quebec</b>                             |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 33,361,072  | 88,552                  | 916,527              | 34,366,152  | 1,102,688,572                   | 3.1%        | 8,249,780   | 88,552                  | 916,527              | 9,254,859  | 1,371,059,1                     |
| Investment for recreational fishing       | 19,528,279  | 88,043                  | 914,170              | 20,530,492  | 642,009,072                     | 3.2%        | 3,921,317   | 88,043                  | 914,170              | 4,923,531  | 574,307,1                       |
| Total direct expenditures incl packages   | 23,508,261  | 926,280                 | 4,961,628            | 29,396,168  | 469,099,376                     | 6.3%        | 6,115,935   | 926,280                 | 4,961,628            | 12,003,842 | 378,894,0                       |
| Total expenditures                        | 56,869,333  | 1,014,832               | 5,878,155            | 63,762,320  | 1,571,787,948                   | 4.1%        | 14,365,715  | 1,014,832               | 5,878,155            | 21,258,702 | 27,136,8                        |
| Total attributable expenditures           | 43,036,540  | 1,014,323               | 5,875,797            | 49,926,660  | 1,111,108,448                   | 4.5%        | 10,037,253  | 1,014,323               | 5,875,797            | 16,927,373 | 22,803,1                        |
| % attributable to recreational fishing    | 75.7%       | 99.9%                   | 100.0%               | 78.3%       | 70.7%                           |             | 69.9%       | 99.9%                   | 100.0%               | 79.6%      | 84.1                            |
| <b>Atlantic - Atlantic salmon anglers</b> |             |                         |                      |             |                                 |             |             |                         |                      |            |                                 |
| Total investment                          | 63,155,732  | 621,574                 | 1,622,048            | 65,399,354  | 1,399,246,844                   | 4.7%        | 38,475,126  | 1,214,684               | 2,390,424            | 42,080,235 | 1,684,883,4                     |
| Investment for recreational fishing       | 36,268,012  | 312,691                 | 1,488,088            | 38,068,791  | 769,466,700                     | 4.9%        | 20,259,581  | 523,902                 | 2,097,063            | 22,880,545 | 727,769,4                       |
| Total direct expenditures incl packages   | 33,122,697  | 4,796,919               | 13,609,409           | 51,529,025  | 559,564,704                     | 9.2%        | 17,469,480  | 5,149,714               | 11,390,830           | 34,010,025 | 422,906,3                       |
| Total expenditures                        | 96,278,430  | 5,418,493               | 15,231,456           | 116,928,379 | 1,958,811,548                   | 6.0%        | 55,944,607  | 6,364,398               | 13,781,254           | 76,090,260 | 2,107,789,8                     |
| Total attributable expenditures           | 69,390,709  | 5,109,610               | 15,097,497           | 89,597,816  | 1,329,031,404                   | 6.7%        | 37,729,061  | 5,673,616               | 13,487,893           | 56,890,570 | 1,150,675,7                     |
| % attributable to recreational fishing    | 72.1%       | 94.3%                   | 99.1%                | 76.6%       | 67.8%                           |             | 67.4%       | 89.1%                   | 97.9%                | 74.8%      | 54.1                            |

**Working Group on Socio-Economics**

**WGSE(08)16**

***Overview of Existing Information on the Social and Economic Values  
of Wild Atlantic Salmon – updating by the Parties***

### Overview of existing knowledge/data/studies of the social and economic values of wild Atlantic Salmon\*

| Values / Country                    | USA     | Canada  | Greenland | Iceland | Faroe Isl. | Norway  | Russia | UK (Scot) | UK (E & W) |
|-------------------------------------|---------|---------|-----------|---------|------------|---------|--------|-----------|------------|
| <b>Economic value</b>               |         |         |           |         |            |         |        |           |            |
| Use                                 | r       | RC      |           | R       |            | Cr      |        | RC        | RC         |
| Non-use                             | x       | x       |           | X       |            | X       |        |           | X          |
| <b>Economic impacts</b>             |         |         |           |         |            |         |        |           |            |
| Direct                              |         | RC      | C         | R       | c          | RC      | r      | R         | Rc         |
| Indirect                            |         | r       |           | R       |            | r       |        | R         | R          |
| Cost/benefit                        |         | rc      |           | R       |            | r       |        |           | R          |
| <b>Social and cultural benefits</b> |         |         |           |         |            |         |        |           |            |
| Psychological                       | r       |         |           |         |            | r       |        |           |            |
| Social                              | r       |         |           | r       |            | rc      |        |           |            |
| Cultural/indigenous peoples         |         | s       |           |         |            | s       |        |           | C?         |
| Values / Country                    | UK (NI) | Ireland | Finland   | Sweden  | Denmark    | Germany | France | Spain     |            |
| <b>Economic value</b>               |         |         |           |         |            |         |        |           |            |
| Use                                 |         | RC      | R         | r       | r          |         |        | r         |            |
| Non-use                             |         |         |           |         |            |         |        |           |            |
| <b>Economic impacts</b>             |         |         |           |         |            |         |        |           |            |
| Direct                              |         | RC      |           |         |            |         |        |           |            |
| Indirect                            |         | RC      |           |         |            |         |        | r         |            |
| Cost/benefit                        |         | RC      |           |         |            |         |        |           |            |
| <b>Social and cultural benefits</b> |         |         |           |         |            |         |        |           |            |
| Psychological                       |         | RC      |           |         |            |         |        |           |            |
| Social                              |         | RC      |           |         |            |         |        | r         |            |
| Cultural/indigenous peoples         |         | RC      |           |         |            |         |        | r         |            |

\* This table focuses on studies of Atlantic salmon, but it is recognised that studies of other fish resources or other environmental issues provide useful information for enhancing knowledge of the social and economic values of Atlantic salmon. The table is incomplete and may be added to by each of the countries listed.

**Legend:** Relevance of study      Significant      Minor  
R/C/S      r/c/s

R C S indicate recreational, commercial or subsistence

X indicates non-use value

? indicates uncertainty

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***Note:** This is not a comprehensive bibliography of studies concerning the social and economic value of Atlantic salmon. It is a selection of studies provided by the Parties as background information for the three NASCO meetings on social and economic values of wild salmon held in 2003, 2004 and 2008.*

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Whelan B.J. and Marsh G. (1988). An economic evaluation of Irish angling. Report prepared for the Central Fisheries Board. The Economic and Social Research Institute, Dublin. 84 pp.

Whelan, B., Aas, O., Uglem, I., Curtis, J. and Dervo, B. (2006). Assessment of the socio-economic value of aquaculture and sport angling for wild salmonids in northwestern Europe. Implications for treatments of sea lice infestation. NINA Report 126. NINA, Norway. 45pp.

*The following background papers, available from the Secretariat, were submitted to the first Technical Workshop meeting held in Edinburgh, and contain information on the social and economic value of Atlantic salmon:*

WSEV(03)3 Social and Economic Values of Atlantic Salmon – Information provided by the Parties (Canada, Denmark (in respect of the Faroe Islands and Greenland), European Union, Norway, Russia, USA)

- WSEV(03)5 Economic Value of Icelandic Salmon (*Salmo salar* L.) in Angling and Net Fisheries
- WSEV(03)6 Freshwater Fisheries in Iceland
- WSEV(03)7 The Value of the Atlantic Salmon and its Fisheries in England and Wales
- WSEV(03)9 Social and Economic Values of Atlantic Salmon - Information provided by the Parties - European Union – Finland
- WSEV(03)10 Social and Economic Values of Atlantic Salmon – Canada

**Council**

**CNL(08)39**

***St Pierre and Miquelon Salmon Fishery***

**CNL(08)39**

***St Pierre and Miquelon***

The attached letter, information on management of the fishery, details of catches and of the number of licenses issued, and a report on the scientific sampling programme were received today, 27 May, from the French Ministry of Agriculture and Fisheries.

With regard to France (in respect of St Pierre and Miquelon) acceding to the NASCO Convention, the letter indicates that a decision requires a process of consultation between different Ministries and Authorities. This process is underway.

The 2007 catch of 2,032 tonnes was the second lowest in the ten year time-series and almost 43% lower than in 2006. The number of licenses remains at about the same level as in 2005 and 2006 but the French authorities indicate that they are committed to reducing this number to limit the harvest on the fragile salmon stocks. A biometric sampling programme was in place in 2007 but there has been no genetic sampling since that undertaken in 2004.

Secretary  
Edinburgh  
13 August 2008



MINISTRY OF FISHING AND AGRICULTURE

**Maritime Fisheries and  
Aquaculture Directorate**

**Maritime Fisheries Division**

**Resource, Regulation and  
International Affairs Bureau**

3, place Fontenoy  
75700 Paris 07 SP

**The Director for Fishing and Aquaculture  
to  
The Secretary of NASCO**

**11 Rutland Square  
Edinburgh  
EH1 2AS  
UK**

**cc. :**

**Maritime Affairs Dept.;  
Saint Pierre et Miquelon;  
MOM-DAPAF – Mr. DEGENMANN;  
MEDAD – Water Service – Mr. GUERY.**

Dossier under the responsibility of : Ludovic SCHULTZ

email : [ludovic.schultz@agriculture.gouv.fr](mailto:ludovic.schultz@agriculture.gouv.fr)

Tel. : 01 49 55 82 38

Fax. : 01 49 55 82 00

Ref. no.: 1083

Paris, 22<sup>nd</sup> Mai 2008

**Re-:/** 2008 Report to the North Atlantic Salmon Conservation Organisation (NASCO).

**Enc.: 2**

Dear Secretary,

In respect of Saint-Pierre et Miquelon, and in response to your letter of 9<sup>th</sup> April, please find enclosed the report from France on wild salmon fishing activities, which is intended as preparatory material for NASCO's next Annual Meeting.

As in the previous year, this report contains a section on Saint Pierre et Miquelon salmon fishing activity which describes the regulatory framework of this fishery and provides some statistical information. A second section refers to the biometric study undertaken by IFREMER in 2007.

With reference to your enquiry about the position of France (in respect of Saint Pierre et Miquelon) on acceding to the NASCO Convention, a decision can only be made to join international organisations such as NASCO, once a process of consultation between several ministerial departments has taken place. This would also require seeking the approval of the relevant territorial authorities. This process, which is now under way, should continue into the second semester.

As Observer, France will therefore be represented during the next Annual meeting by Mrs. Christianne LAURENT-MONPETIT, from the State Secretariat for Overseas Affairs.

Yours faithfully,

pp. François GAUTHIEZ, Assistant Director

in the absence of the Director for Maritime Fisheries and Aquaculture

copies:

Références informatiques

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|   |
|---|
| <p><b>Data relating to the salmon fishing activity at Saint-Pierre et Miquelon addressed to NASCO's Parties, for their information (June 2008 Annual Meeting)</b></p> |
|---|

Given its geographical location, next to Newfoundland banks, Saint-Pierre and Miquelon has always been strongly dependent on maritime fishing activities.

In keeping with this tradition, the inhabitants of the archipelago have included in their fishing activities a fairly small catch from the wild salmon stock.

However, this has never constituted a trading activity as no fish has ever been intended for export.

The continuation of this traditional form of fishing is therefore a cultural rather than a commercial activity.

Besides, this activity has been subjected to a strict regulatory framework. This framework is intended to evolve in time with the view to progressively reduce the fishing effort on this particular stock.

Finally, the programme of scientific study, initiated two years ago, has been extended so as to gain a better understanding of this stock, in agreement with NASCO's recommendations on this point.

### **I – Fishery regulatory framework**

The regulatory framework, within which this type of fishing activity is undertaken, has not changed over the last year. Fishing is indeed carried out in accordance with the 19<sup>th</sup> March 1987 Decree no. 87-182, which sets the minimum size of salmon caught, and with management and conservation measures as defined by the 20<sup>th</sup> March 1987 Ministerial Decree.

These measures are based on the following points:

- ✓ A limited period for the fishing season (1<sup>st</sup> May to 31<sup>st</sup> July);
- ✓ A ban on the setting of fishing gear at the opening of water courses;
- ✓ A limitation on the length of the nets;
- ✓ A minimum mesh size set to 125 mm;
- ✓ A minimum size for any captured salmon of 48 cm;
- ✓ An obligation to declare catches.
- ✓ An obligation to hold a fishing permit issued by the Prefect (as State Representative)

### **II- Permit allocation**

Fishing permits are allocated to professional fishermen who can then sell on their catch. They are also issued to leisure fishermen who retain their catch for personal consumption. There is no export of salmons. Every single fish is sold on the local market. In practice, the few salmons which are sold tend to be privately consumed. These sales are to restaurants or to private individuals only through the local fish traders.

It is also important to remember, at this juncture, that the expression “professional fishing” is in fact referring to a traditional subsistence fishery by a local community highly dependent on fishing rather than to a truly commercial activity.

One should note that no salmon fishing takes place in the rivers of the Archipelago.

In 2007, 13 fishing permits were issued to professional fishermen and 53 to leisure fishermen. The number of permits remains stable compared with the previous year.

One must note however that only 7 professional fishermen and 49 leisure fishermen were actively involved in fishing for salmon in 2007.

### **III/ Statistical data concerning salmon fishing at Saint-Pierre et Miquelon**

#### **3-1/ Catch statistics**

| <b>CATCHES</b><br><b>(in kilogramme per live weight)</b> |                             |                        |              |
|--|-----------------------------|------------------------|--------------|
| <b>Years</b>   | <b>Professional fishing</b> | <b>Leisure fishing</b> | <b>Total</b> |
| 1998   | 1,039                       | 1,268                  | 2,307        |
| 1999   | 1,182                       | 1,140                  | 2,322        |
| 2000   | 1,134                       | 1,133                  | 2,267        |
| 2001   | 1,544                       | 611                    | 2,155        |
| 2002   | 1,223                       | 729                    | 1,952        |
| 2003   | 1,620                       | 1,272                  | 2,892        |
| 2004   | 1,499                       | 1,285                  | 2,784        |
| 2005   | 2,243                       | 1,044                  | 3,287        |
| 2006   | 1,730                       | 1,825                  | 3,555        |
| 2007   | 970                         | 1062                   | 2032         |

It has been reported that a significant reduction in the volume of catches, amounting to 42%, occurred in 2007. This is broken down as follows:

- 44% drop in the professional catches
- 42% drop in the leisure catches (ie. 470 salmons only).

This reduction in the catches results partly from the efforts made in raising awareness amongst the professionals during these last years.

The restricted leisure fishing activity is also noteworthy (470 salmons caught by 49 ships, ie. an average of 10 salmons caught every 3 months per leisure fisherman or 1 salmon every 9 days).

#### **3-2/ Permits issued**

| <b>PERMITS ISSUED</b> |                             |                        |              |
|-----------------------|-----------------------------|------------------------|--------------|
| <b>Years</b>          | <b>Professional fishing</b> | <b>Leisure fishing</b> | <b>Total</b> |
| 1998                  | 9                           | 42                     | 51           |
| 1999                  | 7                           | 40                     | 47           |
| 2000                  | 8                           | 35                     | 43           |
| 2001                  | 10                          | 42                     | 52           |
| 2002                  | 12                          | 42                     | 54           |
| 2003                  | 12                          | 42                     | 54           |
| 2004                  | 13                          | 42                     | 55           |
| 2005                  | 14                          | 52                     | 66           |
| 2006                  | 13                          | 52                     | 65           |
| 2007                  | 13                          | 53                     | 66           |

Given NASCO's recommendations on this point, the mid-term objective is to pursue the trend in the reduction of catches made from this resource. The local Authorities therefore intend to maintain this objective on a year-on-year basis, by continuing, more particularly, to control the number of fishing permits granted for this activity.

Furthermore it must be noted that the number of fishing permits actually issued and used (49 in 2007) is lower to that initially requested and accepted by the authorities (53 in 2007).

#### **IV – The scientific programme**

As part of this cooperation with NASCO, the French authorities have implemented, in 2003, a programme of scientific monitoring under the leadership of the *Institut Français de Recherche pour l'Exploitation de la Mer* (IFREMER). This programme, inspired by a project devised by NASCO, is based on the following constituents:

- ❖ A biometric study,
- ❖ A genetic study,
- ❖ A pathological study.

##### **2-1/ The biometric study**

The purpose of this project is to better define the characteristics of the salmon population. This biometric study, launched in 2003, was continued over the past year in accordance with the commitments made.

However, given the low number of salmon caught, only one sampling took place in 2007. Details of the results of this study are attached to this document.

##### **2-2-2/ The genetic study**

This constituent of the study was initiated in 2004. Results of analyses undertaken in cooperation with the Canadian Authorities have been sent to the Organisation's Secretariat. Further work could be undertaken in the future.

##### **2-2-3/ Pathological study**

To date, this aspect of the study has not yet been initiated, but is still planned.

**In summary, France has pursued her commitment, with regard to improving the knowledge of this fishery and has implemented measures aiming to reduce the exploitation of this resource.**

**More particularly, in terms of the scientific programme, the work on the biometric constituent of this programme, aiming to improve the knowledge of this fishery, has been continued.**

**With regard to the management measures, the French Authorities have implemented a procedure aiming to reduce the number of permits issued in order to reduce progressively the catches made from this vulnerable stock.**



**IFREMER local office  
Saint-Pierre et Miquelon**

**Report on the biometric study undertaken in 2007 on the Atlantic salmon (*Salmo salar*) in  
Saint-Pierre et Miquelon**

*Daniel Briand, IFREMER  
(January 2008)*

In 2007, salmon fishing at Saint-Pierre et Miquelon took place mainly during the month of June.

However, compared with the previous years, the study carried out amongst the salmon fishermen revealed the following differences:

1) The salmon arrived “late” in 2007, and no particular reason can be invoked for this: According to professional fishermen, as always, it could not be the consequence of bad weather as the weather had not been bad. There was also no evidence that this delay was the consequence of the dirtying of nets.

2) Professional fishermen reported that salmons arrived on the coast, “all mixed in” (larger salmons were caught at the same time as smaller salmons). This differed from the previous years when larger salmons were caught earlier.

3) Finally, it had been noticed that salmons were positioned in the nets in a primarily east-west direction.

**Catches**

Fishermen considered 2007 as a poor year for salmon. Indeed, the official catch figures for 2007 (source: Maritime Affairs Department of Saint Miquelon) show a net decrease amongst both the professional and leisure fishermen, for the same fishing effort.

Catches by professional fishermen amounted to 970kg, compared to 1,580kg in 2006 and that of the leisure fishermen 977 kg, compared to 1,589kg the previous year.

**1 – Fishing sites**

The fishing sites and fishing gear were the same as the previous year (see Figure 1).

The sites, where nets were laid, are as follows:

Cap Noir, Ile aux Chasseurs, Les Flacous, Cap à Gordon, Les Canailles, Cap Bleu, Ile Pelée, Anse à la Vierge, Anse de l’Ouest, Rochers de l’Est, Caillou aux Chats, Basse Gélén, Basse des Grappains, Ile aux Vainqueurs, Pointe Blanche, Enfant Perdu, Cap Percé, Pointe Anse à Pierre, Cap aux Morts, Ilot Noir, Mirande, Trou aux Renards, Cap à Dinan, Basse Tournioure. Figure 5 indicates the sectors where salmon fishing took place.

## 2 – Fishing gear

The fishing gear used by fishermen at Saint-Pierre et Miquelon is a “t  sure” made up of 3 or 4 nets linked end to end. Made in Canada, these nets are laced up with 60/100 mm diameter polyamide monofilament thread. The thread colour depends on the size of the mesh, when stretched out, being dark green for the nets with a mesh of 5 inches (125 mm) wide or olive green for those with a mesh of 6 inches (150 mm). It is worth noting that the nets used are unlikely to all be exactly identical.

The authorised net length for the professional fishermen is 360 metres; leisure fishermen are permitted to use 180 metres long nets (25<sup>th</sup> April 2007 bylaw).

## 3 – Sampling from the 2007 landings

Biological sampling from the landings was carried out, in 2007, on a small number of salmon for the following reasons:

The sampling protocol sets out that the IFREMER local office must be contacted by the two local fish traders, as soon as they hold at least 10 or more salmon. Only then would the practical details of the sampling operation be established with the directors of the fish traders so that the handling takes place in the best possible conditions for both parties.

However, in 2007, the numbers of salmon exceeded 10 salmon only once, hence the only one sampling.

Following an investigation, it would appear that given the level of catches, the salmon fishermen preferred selling their salmon within their families or amongst the neighbourhood.

|                                      | 2003   | 2004    | 2005    | 2006   | 2007    |
|--------------------------------------|--------|---------|---------|--------|---------|
| Number of samplings                  | 12     | 11      | 8       | 19     | 1       |
| Date of the 1 <sup>st</sup> sampling | 4 June | 5 June  | 6 June  | 6 June | 14 June |
| Date of the last sampling            | 6 July | 29 June | 23 June | 4 July | 14 June |
| Total weight sampled (in kg)         | 872    | 837     | 718     | 926    | 49      |
| Number sampled                       | 340    | 355     | 310     | 391    | 12      |
| Number weighed                       | 340    | 355     | 310     | 391    | 12      |

Tab. 1 - Summary of the sampling exercise carried out on the salmon from 2003 to 2007 at Saint-Pierre et Miquelon

#### 4 – Sizes and weights recorded during the 2007 sampling

The total sampled weight was 48.6kg for 12 fishes. The average weight is 4kg and 50 grammes and the average height is 76.4 cm.

| Length in centimetres | Weight in kilo. |
|-----------------------|-----------------|
| 71                    | 2.900           |
| 72                    | 3.550           |
| 73                    | 3.450           |
| 74                    | 3.550           |
| 75                    | 4.350           |
| 75                    | 3.950           |
| 78                    | 4.100           |
| 78                    | 4.750           |
| 79                    | 4.200           |
| 79                    | 4.100           |
| 80                    | 4.650           |
| 82                    | 5.050           |

Tab. 2 – Sizes and weight recorded during the 2007 sampling of salmon

#### 4) Numbers and weights as recorded on the fishermen's fishing log

The table below shows the declared catches, at the end of the season, as they are recorded in the leisure fishermen's fishing logs (source: Maritime Affairs). One must note however that not all the fishermen had returned this document at the time of writing this report.

| Length of the nets in metres | Number of caught salmon | Weight of the caught salmon (kg) | Average |
|------------------------------|-------------------------|----------------------------------|---------|
| 180                          | 8                       | 13                               | 1.6     |
| 180                          | 4                       | 15                               | 3.8     |
| 180                          | 6                       | 11                               | 1.8     |
| 180                          | 11                      | 24                               | 2.2     |
| 180                          | 1                       | 4.5                              | 4.5     |
| 180                          | 5                       | 20                               | 4.0     |
| 180                          | 12                      | 30                               | 2.5     |
| 180                          | 6                       | 15                               | 2.5     |
| 180                          | 12                      | 45                               | 3.8     |
| 180                          | 2                       | 6                                | 3.0     |
| 180                          | 9                       | 30                               | 3.3     |
| 180                          | 6                       | 12                               | 2.0     |
| 180                          | 3                       | 5                                | 1.7     |
| 180                          | 5                       | 11                               | 2.2     |
| 180                          | 9                       | 21.5                             | 2.4     |
| 180                          | 8                       | 16                               | 2.0     |
| 180                          | 18                      | 32                               | 1.8     |
| 180                          | 15                      | 28                               | 1.9     |
| 180                          | 8                       | 14                               | 1.8     |

|     |    |      |     |
|-----|----|------|-----|
| 180 | 10 | 16.9 | 1.7 |
| 180 | 10 | 16.3 | 1.6 |
| 180 | 30 | 71.2 | 2.4 |
| 180 | 9  | 16   | 1.8 |
| 180 | 9  | 26   | 2.9 |
| 180 | 3  | 12.4 | 4.1 |
| 180 | 11 | 26   | 2.4 |
| 180 | 8  | 19   | 2.4 |
| 180 | 4  | 10   | 2.5 |
| 180 | 16 | 40   | 2.5 |
| 180 | 12 | 23   | 1.9 |
| 180 | 8  | 14   | 1.8 |
| 180 | 6  | 13.2 | 2.2 |
| 180 | 10 | 30   | 3.0 |
| 180 | 15 | 32   | 2.1 |
| 180 | 36 | 87   | 2.4 |
| 180 | 2  | 8    | 4.0 |
| 180 | 34 | 64   | 1.9 |
| 180 | 18 | 36   | 2.0 |
| 180 | 6  | 7.2  | 1.2 |
| 180 | 12 | 16   | 1.3 |
| 180 | 5  | 16   | 3.2 |
| 180 | 11 | 23.8 | 2.2 |

### Studies in the “Belle Rivière”

The leisure fishing Association of Saint-Pierre-Langlade, in cooperation with the services for Agriculture and Forests and the Office National de la Chasse et de la Faune Sauvage (ONCFS - *Hunting and Wild Fauna National Office*) has undertaken a study in the Belle Rivière to establish the presence of salmons.

Parrs have been captured during electrical fishing taking place between 1998 and 2000. However no adult salmon has ever been captured nor even observed. And yet, each year some fishermen report the presence of young fishes.

The aim of this study was therefore to estimate the presence of salmons in this water course and to define their migration.

To this end, a trap made up of 2 cages was placed in the river to enable the capture of salmons swimming from both directions. This was supplemented with a system of nets laid across the river so as to direct the fishes towards the trap.

The production service of the Agriculture Department was commissioned both to manufacture and install the trap during the first the two weeks in April.

The operation nonetheless proved fruitless as heavy rainfall raised the water level of the river to cause the trap to be swept away. Should the decision be taken to repeat the operation in 2008, steps will be taken to improve the installation.

### 5 – Results from the water temperature checks

Six water temperature checks, at 5 metres depth, were made near the fishing zone during the period extending from the end of May through to the beginning of July. The lowest temperature registered was on the 23rd May (5.0°C) and the highest on the 4<sup>th</sup> July (10.0°C).

| Day | Month | Depth in metres | Temp. °C in 2003 | Temp. °C in 2004 | Temp. °C in 2005 | Temp. °C in 2006 | Temp. °C in 2007 |
|-----|-------|-----------------|------------------|------------------|------------------|------------------|------------------|
| 20  | 5     | 5               | 1.8              |                  |                  | 5.0              |                  |
| 23  | 5     | 5               |                  |                  | 3.6              |                  | 5.0              |
| 24  | 5     | 5               |                  | 3.8              |                  |                  |                  |
| 1   | 6     | 5               |                  | 4.3              |                  | 5.1              | 5.1              |
| 4   | 6     | 5               | 3.12             |                  |                  |                  |                  |
| 9   | 6     | 5               |                  | 4.5              |                  |                  | 6.9              |
| 10  | 6     | 5               | 3.9              |                  |                  | 6.9              |                  |
| 14  | 6     | 5               |                  | 4.6              |                  |                  |                  |
| 15  | 6     | 5               |                  |                  | 6.1              | 6.9              | 6.9              |
| 20  | 6     | 5               |                  |                  | 6.4              |                  |                  |
| 21  | 6     | 5               |                  | 5.4              |                  |                  |                  |
| 23  | 6     | 5               | 6.1              |                  |                  |                  |                  |
| 27  | 6     | 5               |                  |                  | 6.5              | 7.5              | 6.5              |
| 28  | 6     | 5               |                  | 7.5              |                  |                  |                  |
| 30  | 6     | 5               | 7.9              |                  |                  |                  |                  |
| 4   | 7     | 5               |                  |                  | 8.9              | 10.0             | 10.0             |

### List of figures

Fig. 1 – Atlantic salmon fishing net sites at Saint-Pierre et Miquelon in 2007



**CNL(08)26**

**Council**

***Salmon Management in the Baltic Sea  
(tabled by the European Union)***

## CNL(08)26

### *Salmon Management in the Baltic Sea*

At the Twenty-Fourth NASCO Annual Meeting held in Maine, USA, the parties expressed interest in obtaining information about the Baltic salmon, which is managed separately from Atlantic salmon, through bilateral agreements between the Russian Federation and the European Union. The EU agreed to provide information to the Council on the management of Salmon in the Baltic Sea.

The European Community would like to inform NASCO of the several management measures in place. These are as follows:

Catch limitations via the setting of TACs (Total Allowable Catches) and quotas for the two management areas; EC waters of SDs 22-31 (Main Basin) and SD 32 (Gulf of Finland) on an annual basis<sup>3</sup> (note that overall catch levels are only 45% of the TACs)

Prohibition of drift net fishery since 1 January 2008<sup>4</sup>

Seasonal closures in the Main Basin from 1 June to 15 September and 15 June to 30 September in the Gulf of Finland beyond 4nm except for catches with trap-nets<sup>5</sup>

Minimum landing size of 60cm for Main Basin except SD 31 and Gulf of Finland and 50cm for SD 31<sup>6</sup>

Limit for the dioxin level (Derogation for Finland and Sweden until 2011 when respective public information is provided)

Additionally, individual member states may have supplemental measures in place.

Following the cessation of the International Baltic Sea Fishery Commission (IBSFC) after 2005 and the expiry of the IBSFC Salmon Action Plan the EU will develop a new management plan for salmon in the Baltic Sea. The proposal is to be presented by the end of 2008.

The proposal for a new Baltic salmon management plan will be informed by the results of two currently ongoing research projects:

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3 For 2008 this is Council Regulation (EC) No 1404/2007

4 Article 9 of Council Regulation (EC) No 2187/2005

5 Article 17 of Council Regulation (EC) No 2187/2005

6 Annex 4 to Council Regulation (EC) No 2187/2005



ICES has been requested to evaluate the past IBSFC plan and give advice by the end of June 2008 on potential new management options (existing management vs only marine measures vs integrated marine and freshwater approach) taking account of commercial and recreational fisheries and environmental impacts such as habitat use, genetic interactions with aquaculture and contamination.

A tender has been given to a research consortium of research institutions from different Baltic MS led by the Finish Game and Fisheries Research Institute to review the socio-economic impact of the past IBSFC plan and to evaluate the socio-economic impact of the different management options to be generated by ICES

No future research projects are planned at the moment. However, it is likely that new research will be undertaken following the plan implementation period. These will be expected to form the basis for a performance evaluation of the plan and a potential review of the specified measures.



**CNL(08)36**

**Twenty-Fifth Annual Meeting  
Gijon, Asturias, Spain  
June 2-6, 2008**

**North Atlantic Countries Commit to Actions to Save Wild Salmon  
International Cooperation At All Time High**

The Annual Meeting of the North Atlantic Salmon Conservation Organization (NASCO) concluded on June 6 in Gijon, Spain. NASCO made significant advancements in a critical program of North Atlantic-wide research. Through the SALSEA (Salmon at Sea) Programme, investigations are underway regarding the reasons for high mortality of Atlantic salmon during their sea phase. Many European and North American countries committed significant funding, ship time, and scientific personnel to support integrated research programs.

*“Uncovering the reasons wild Atlantic salmon are dying in great numbers at sea is perhaps the most important step NASCO and its members can take for the species,” said NASCO President Dr. Ken Whelan. “The realization of coordinated international research programs across the North Atlantic demonstrates an incredible level of international cooperation and commitment to ensuring the future of this magnificent fish. It is an exciting time to be involved with Atlantic salmon.”*

In a groundbreaking step, NASCO members finalized plans articulating their salmon conservation commitments. Countries also provided detailed plans focusing on management of salmon fisheries. Both plans were reviewed and assessed in advance of the meeting by groups that included government and non-government representatives. The reporting and review process ensures a high level of transparency in the salmon conservation actions of countries and improves accountability. In 2009, countries will report on habitat protection, and, in 2010, on their management of the impacts of salmon aquaculture and related activities on wild Atlantic salmon populations.

*“NASCO is really at the forefront of international fisheries organizations in promoting adherence by members to conservation agreements,” stressed Dr. Whelan. “I know of no other Organization where the members report on conservation activities and plans in such detail and where implementation of agreements is so well scrutinized. This is yet another example of the commitment of NASCO members to the conservation and recovery of the wild Atlantic salmon.”*

To protect declining populations of Atlantic salmon, Greenland and the Faroe Islands agreed to manage their salmon fisheries in a precautionary manner in accordance with scientific advice. No fishery has occurred in Faroe Islands since 2000 and the West Greenland fishery will be limited to internal consumption, which is estimated to be about 20 tonnes.

A new President, Mr. Arni Isaksson of the Icelandic Food and Veterinary Authority was

elected and Ms Mary Colligan of the US National Marine Fisheries Service was elected Vice-President.

### **Notes for editors**

NASCO is an intergovernmental organization formed to promote the conservation, restoration, enhancement, and rational management of salmon stocks in the North Atlantic Ocean. NASCO's members are Canada, Denmark (in respect of the Faroe Islands and Greenland), the European Union (which currently has 27 member states), Iceland, Norway, the Russian Federation, and the United States of America. Representatives of these Parties and from 13 non-governmental organizations (NGOs) and 2 inter-governmental organizations (IGOs) also attended the meeting.

The report of the 2008 NASCO Annual Meeting with annexes and other information on Atlantic salmon and the Organization will be made available on the NASCO website: [www.nasco.int](http://www.nasco.int). In addition, detailed information on coordinated international research on salmon at sea can be found at [www.salmonatsea.com](http://www.salmonatsea.com).

The next Annual Meeting of NASCO will be held from 1 to 5 June 2009 in Norway.

For further information contact:

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**CNL(08)00*****List of Council Papers***

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| CNL(08)7                | Report of the ICES Advisory Committee (to be distributed by ICES)   |
| CNL(08)8                | Report of the Seventh Meeting of the International Atlantic Salmon Research Board (issued at meeting)     |
| CNL(08)9                | Request for Scientific Advice from ICES (issued at meeting)   |
| CNL(08)10               | Report of the First <i>Ad Hoc</i> Review Group on Implementation Plans                                    |
| CNL(08)11               | Compilation of final Implementation Plans (issued on CD)  |
| CNL(08)12               | Compilation of Fisheries Management Focus Area reports  |
| CNL(08)13               | Report of the Fisheries Management Focus Area Review Group – Issues and Questions for the Parties         |
| CNL(08)14               | Progress Report on Implementing a Public Relations Strategy for NASCO                                     |
| CNL(08)15               | Annual Reports on Implementation Plans  |
| CNL(08)16               | Liaison with the North Atlantic salmon farming industry   |
| CNL(08)17               | Report of the Socio-Economics Working Group **  |
| CNL(08)18               | Report on Progress with the Development of a Database of Salmon Rivers                                    |
| CNL(08)19               | St Pierre and Miquelon Salmon Fishery   |
| CNL(08)20               | Summary of Council Decisions  |
| CNL(08)21               | Application of NGO Observer Status to NASCO   |
| CNL(08)22               | St Pierre and Miquelon Salmon Fishery   |
| CNL(08)23               | 2007 US Emerging Threats and Opportunities  |
| CNL(08)24               | First Year Report on Actions under the US Implementation Plan – Activities in 2007                        |
| CNL(08)25               | Presentation of ICES Scientific Advice  |

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| CNL(08)26          | Salmon Management in the Baltic Sea (Tabled by the EU)                                   |
| CNL(08)27          | <i>2009 Budget, 2010 Forecast Budget and Schedule of Contributions (Pounds Sterling)</i> |
| CNL(08)28          | SALSEA-North America Research Strategy for the Study of Atlantic Salmon Marine Ecology   |
| CNL(08)28<br>(rev) | SALSEA-North America Research Strategy for the Study of Atlantic Salmon Marine Ecology   |
| CNL(08)29          | Report On Canada's Implementation Plan June 2008   |
| CNL(08)30          | 2005 Survey of Recreational Fishing in Canada  |
| CNL(08)31          | Draft Report of the PR Sub Group   |
| CNL(08)32          | Draft Report of the Twenty-Fifth Annual Meeting of the Council                           |
| CNL(08)33          | Focus Area Report on Protection, Restoration and Enhancement of Salmon Habitat           |
| CNL(08)34          | Presentation by Ken Whelan IASRB   |
| CNL(08)35          | Report   |
| CNL(08)36          | Press Release  |
| CNL(08)37          | Focus Area Report on Aquaculture   |
| CNL(08)38          | Agenda   |
| CNL(08)39          | St Pierre and Miquelon Salmon Fishery (English Translation)                              |