



2011

REPORT OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE COUNCIL

Ilulissat, Greenland

4 - 6 JUNE 2011

President:	Ms Mary Colligan (USA)
Vice-President:	Mr Steinar Hermansen (Norway)
Secretary:	Dr Malcolm Windsor

CNL(11)43

CONTENTS

	<u>PAGE</u>
Report of the Twenty-Eighth Annual Meeting of the Council of the North Atlantic Salmon Conservation Organization, 4 - 6 June 2011, Hotel Arctic, Ilulissat, Greenland	1
Compte rendu de la Vingt-huitième réunion annuelle du Conseil de l'Organisation pour la Conservation du Saumon de l'Atlantique Nord, 4 - 6 juin 2011,	9
Annex 1 Opening Statement made by the President of NASCO	19
Annex 2 Welcoming Address made by The Honourable Ane Hansen, Minister for Fisheries, Hunting and Agriculture, Government of Greenland	21
Annex 3 Opening Statements made by the Parties	23
Annex 4 Opening Statement made by the European Inland Fisheries and Aquaculture Advisory Committee (EIFAAC)	35
Annex 5 Address by Kalaallit Nunaani Aalisartut Piniartullu Kattuffiat (KNAPK - The Association of Fishermen and Hunters in Greenland)	37
Annex 6 Opening Statement made by the Non-Government Organizations	41
Annex 7 List of Participants	43
Annex 8 Agenda, CNL(11)38	49
Annex 9 2012 Budget and 2013 Forecast Budget, CNL(11)39	51
Annex 10 Report of the ICES Advisory Committee, Section 10.1 only), CNL(11)8	53
Annex 11 Report of the Tenth Meeting of the International Atlantic Salmon Research Board, CNL(11)9	107
Annex 12 Request for Scientific Advice from ICES, CNL(11)10	127
Annex 13 Final Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group, CNL(11)11	129
Annex 14 Report of the 'Next Steps' for NASCO Review Group, CNL(11)12	227

Annex 15	Terms of Reference for an External Performance Review of NASCO's Work, CNL(11)44	275
Annex 16	Report of the NASCO/North Atlantic Salmon Farming Industry Liaison Group, CNL(11)14	281
Annex 17	Salmon Fishery at St Pierre and Miqueon, CNL(11)16	325
Annex 18	Press Release, CNL(11)42	347
Annex 19	List of Council Papers	349

CNL(11)43

Report of the Twenty-Eighth Annual Meeting of the Council Hotel Arctic, Ilulissat, Greenland

4 - 6 June 2011

1. Opening Session

- 1.1 The President, Ms Mary Colligan (US), opened the meeting and welcomed delegates to Greenland (Annex 1). A welcoming address was made by Ms Ane Hansen, Minister for Fisheries, Hunting and Agriculture (Annex 2).
- 1.2 The representatives of Canada, Denmark (in respect of the Faroe Islands and Greenland), the European Union, Norway, the Russian Federation and the United States of America made Opening Statements (Annex 3).
- 1.3 An Opening Statement was made by the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC) (Annex 4).
- 1.4 A representative of Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat (KNAPK - The Association of Fishermen and Hunters in Greenland) addressed the Council (Annex 5).
- 1.5 An Opening Statement was made on behalf of all the Non-Government Organizations (NGOs) attending the Annual Meeting (Annex 6).
- 1.6 The President expressed appreciation for these statements and closed the Opening Session.
- 1.7 A list of participants is given in Annex 7.

2. Adoption of Agenda

- 2.1 The Council adopted its agenda, CNL(11)38 (Annex 8).

3. Financial and Administrative Issues

Report of the Finance and Administration Committee

- 3.1 The Chair of the Finance and Administration Committee, Ms Sonja Feldthaus (Denmark (in respect of the Faroe Islands and Greenland)), presented the report of the Committee, CNL(11)5. On the recommendation of the Committee, the Council took the following decisions:
 - (i) to accept the audited 2010 annual financial statement, FAC(11)2;

- (ii) to accept a five-year budgeting plan as a basis for establishing the 2012 budget and forecast budgets for the period 2013-2016 and to develop similar plans in future;
- (iii) to adopt a budget for 2012 and to note a forecast budget for 2013, CNL(11)39 (Annex 9);
- (iv) to appoint PricewaterhouseCoopers (PWC) of Edinburgh as auditors for the 2011 accounts, or such other company as may be agreed by the Secretary following consultation with the Chairman of the Finance and Administration Committee;
- (v) to adopt the report of the Finance and Administration Committee.

3.2 Dr Malcolm Windsor will retire as Secretary on 31 August 2012. The Council decided to invite Dr Peter Hutchinson to become Interim Secretary for one year from 1 September 2012. He could then recruit an assistant for up to 12 months from 1 January 2013. The Council will agree a recruitment process for a new Secretary at its 2012 Annual Meeting.

4. Scientific, Technical, Legal and Other Information

4.1 Secretary's Report

The Secretary made a report to the Council on the status of ratifications of, and accessions to, the Convention and membership of the regional Commissions.

He reported on fishing for salmon in international waters by non-NASCO Parties. There had been no sightings during the year since 1 April 2010 but surveillance is limited to the summer months.

In accordance with Financial Rule 5.5, the Secretary reported on the receipt of contributions for 2011. All contributions had been received and there were no arrears.

The Secretary reported, (CNL(11)19), that since NASCO's last Annual Meeting, there had been one application for NGO status to NASCO from the Angling Trust, based in England, UK. Following consultation with the President, this application had been approved. NASCO currently has 35 accredited NGOs.

4.2 Report on the Activities of the Organization in 2010

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 2010, CNL(11)7.

4.3 Announcement of the Tag Return Incentive Scheme Grand Prize

The President announced that the winner of the \$2,500 Grand Prize was Mr Sergey Kanev, Murmanskaya oblast, Russian Federation. The Council offered its congratulations to the winner.

4.4 Scientific Advice from ICES

The representative of ICES, Mr Gérald Chaput, presented the report of the Advisory Committee (ACOM) to the Council, CNL(11)8 (Annex 10). The presentation to the Council is contained in document CNL(11)45.

4.5 Scientific Research Fishing in the Convention Area

The Secretary reported to the Council that there had been no applications to conduct scientific research fishing in the Convention area during 2011.

4.6 Report of the International Atlantic Salmon Research Board

The report of the meeting of the Board, CNL(11)9 (Annex 11), was presented by its Chairman, Professor Ken Whelan.

4.7 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(11)10 (Annex 12).

5. Next Steps for NASCO

5.1 Special Session: Progress with the Next Steps Strategy

(a) Final Report of the Aquaculture and Related Activities Focus Area Review Group

The final report of the Aquaculture and Related Activities Focus Area Review Group, CNL(11)11 (Annex 13), was presented by Mr Tim Sheehan in a Special Session and the findings were discussed. Mr Sheehan's presentation is contained in document CNL(11)46. The Review Group had been asked to review a FAR submitted by EU-Ireland and the relevant sections of a document provided by EU-Spain, CNL(10)36. It had not been necessary for the Review Group to develop recommendations on best practice because in 2009 a Task Force established by the Liaison Group had developed 'Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks', SLG(09)5. Since 2010, the Review Group had completed its Terms of Reference by reviewing the new FAR for EU (Ireland) and by developing an overview of common management and scientific approaches to challenges, as reported in the FARs. The Review Group had considered carefully the feedback it had received and in some cases the assessments in the draft report had been revised to take into account feedback from the Parties. The Council acknowledged the Review Group's report and thanked the Group for its work. All the FARs are available on the NASCO website. Further feedback was received at the Annual Meeting from EU-Ireland, CNL(11)47, and EU-Sweden, CNL(11)48.

(b) Report of the 'Next Steps for NASCO' Review Group

The 'Next Steps for NASCO' Review Group met in March 2011 in Boston and its report was presented in a Special Session, CNL(11)12 (Annex 14).

The Group had reviewed progress in implementing the Strategic Approach under each of the seven challenges it identifies. The Group recognised that while NASCO has moved quickly in implementing the measures in the Strategic Approach these relate mainly to process. The Group made some recommendations for further actions relating to these challenges and proposed that additional feedback be sought during the Special Session at the 2011 Annual Meeting, with a view to considering updating of the Strategic Approach.

For the next cycle of reporting, the Review Group had suggested some streamlining and it recommends that in the new Implementation Plans greater emphasis should be placed on the activities and actions each jurisdiction plans to take over a period of five years. There should be greater emphasis on monitoring and evaluation of activities with clearly described identifiable, measurable outcomes and timescales. It is recommended that, in future, Focus Area Reports should be developed around specific themes and that progress on Implementation Plans could be assessed through the Annual Reports, which would be reviewed. The Review Group had proposed the establishment of a Working Group to develop a framework for future reporting and evaluation which would report back to the 2012 Annual Meeting.

The Review Group had also considered the response from ISFA regarding the evolution of the Liaison Group and had recommended that the Council resolve the future role it envisages for NASCO with regard to aquaculture, introductions and transfers and transgenics before responding to ISFA. An initial discussion document on this topic was tabled by Norway, CNL(11)20.

(c) Progress in implementing a Public Relations Strategy

The Assistant Secretary reported on progress with further development of the NASCO and IASRB websites, including the development of new pages providing socio-economic information (see paragraph 6.4 below), and on incorporating the rivers database information. Since last year, information on approximately 1,500 rivers had been included in the database following verification by the jurisdictions and it is anticipated that when complete the database will hold information on around 2,500 rivers. Further work has been undertaken to enable mapping of the information. The Council agreed that once the web pages for the rivers database are completed, they should be made available for viewing by the jurisdictions on a test site so that Parties can provide feedback to the Secretariat before the pages are made publicly available.

5.2 Decisions by the Council in the light of the 'Next Steps for NASCO' Special Session

The Council decided to establish a Working Group on Future Reporting under Implementation Plans and Evaluation of these Reports to be Chaired by Mr Ted Potter (European Union). The Working Group should comprise one, but no more than two, representatives from each Party and from NASCO's accredited NGOs. The names of those participating in the Working Group should be provided to the Secretariat by 1 July. These individuals should ideally have been involved in preparing the

Implementation Plans and FARs or served on one or more of the Review Groups. The Working Group should complete its work prior to the external performance review and report back to the Council at its Twenty-Ninth Annual Meeting. The Terms of Reference for the Working Group are as follows:

- (a) Develop new guidelines for the preparation of Implementation Plans, drawing on document NSTF(06)10 but with greater emphasis on monitoring and evaluation and including criteria for acceptability, and guidelines for the preparation of Annual Reports. These guidelines should describe the content and format of these reports, the timing for submission of these reports, and the timing and process for distribution of these reports;
- (b) Develop a process for the review of Implementation Plans and Annual Reports including the criteria to be used for the reviews, the timing of the reviews, the composition of the Review Groups, and arrangements for reporting on the reviews;
- (c) Develop a schedule for the development and review of Implementation Plans, submission and review of the Annual Reports, and planning for and conduct of theme-based FAR Special Sessions.

The Council agreed that it would consider the need for revisions to the Strategic Approach for NASCO's 'Next Steps' and possible changes to its meeting schedule and agendas in the light of the findings of the external performance review. With regard to NASCO's future role on aquaculture, the Council decided that this issue should be considered further in the light of the 'Next Steps' Working Group's report and the findings of the external performance review.

5.3 Arrangements for the External Performance Review

At its Twenty-Seventh Annual Meeting, the Council had adopted 'Terms of Reference for a Review of the 'Next Steps' Process, and Council Decision Concerning a Further Performance Review', CNL(10)48. The 'Next Steps' Review Group had discussed ToRs, criteria and a budget for the external review and in the light of these deliberations draft Terms of Reference had been developed by the Secretariat, CNL(11)18. The Council adopted Terms of Reference for the external performance review, CNL(11)44 (Annex 15), and made budgetary provision to cover the costs of the panel members. The Council agreed to the appointment of Mr Michael Shewchuk (nominated by UN DOALOS), Ms Judith Swan (nominated by FAO) and Mr Kjartan Hoydal (Secretary of NEAFC). Details of these candidates can be found in document CNL(11)36. The Council agreed that:

- the criteria attached to the TORs are to be used by the Review Panel as it determines appropriate;
- the review should examine the past, present and future of NASCO and the fitness of the organization given the current challenges facing the salmon;
- the Review Panel should produce a report which critically evaluates the performance of NASCO and makes recommendations for change and improvements;

- the Review Panel should decide how best to carry out its work including the need to hold a second meeting;
- the President and Secretary should provide logistical support to the Panel including background material and points of contact.

6. Conservation, Restoration, Enhancement and Rational Management of Atlantic Salmon under the Precautionary Approach

6.1 Annual Reports on Implementation Plans

The Council's Guidelines for the Preparation of Implementation Plans and for Reporting on Progress, NSTF(06)10, indicate that reports to the Council should be provided in two formats: written annual reports and Focus Area Reports (FARs) presented at Special Sessions and subject to review. The primary purpose of the annual returns is to track progress in implementing the actions contained in the Implementation Plans. A summary of these returns was presented, CNL(11)13. The returns themselves are contained in documents CNL(11)21 - CNL(11)35. The representative of the European Union highlighted several positive developments in this report.

6.2 Liaison with the North Atlantic Salmon Farming Industry

The Chairman of the Liaison Group, Mr Sebastian Belle, presented the report of the Group's meeting, CNL(11)14 (Annex 16). He indicated that at its meeting held on 18 and 19 March 2011, the Liaison Group had, *inter alia*, reviewed the final report from the Aquaculture, Introductions and Transfers and Transgenics FAR Review Group (see 5.1(a) above), considered reporting arrangements on the BMP Guidance, agreed on possible actions to improve communication of the Liaison Group's work, and discussed the evolution of the Liaison Group. With regard to the FAR Review Group's report, the Liaison Group had agreed the following response:

- The Liaison Group thanks the Review Group for its report, complete with its 8 annexes, and encourages NASCO's Parties to make full use of the wealth of information provided;
- Going forward, NASCO Parties should carefully consider the following in its 'Next Steps' process:
 - the extent of NASCO's role with respect to aquaculture, introductions and transfers and transgenics;
 - the roles and responsibilities of the Parties, industry and NGOs with respect to NASCO's role;
 - activities and studies that would best serve NASCO's role going forward.

With regard to reporting on the BMP Guidance, the Liaison Group had noted that the 'Next Steps for NASCO' review would be considering future reporting in relation to all of NASCO's agreements, and had agreed to reconsider the reporting requirements under the BMP Guidance in the light of this review. A proposal from Canada on the reconstitution of the Liaison Group had been discussed. A number of options were considered and ISFA had indicated after the meeting (see Attachment 1 of CNL(11)14) that it would prefer to engage directly with the Parties through a seat at the NASCO Annual Meeting, consistent with that afforded to the NGOs. The Liaison Group had

also proposed a change to its Constitution to allow for the election of a Vice Chairman.

The Council decided that, in view of the ongoing 'Next Steps' process and the external performance review, it would consider the most appropriate approach to continuing its liaison with the salmon farming industry, which it greatly valued, at its 2012 meeting. The Council agreed that the Liaison Group did not need to meet prior to the 2012 Annual Meeting. The Council agreed that the Constitution of the Liaison Group should be changed to allow for election of both a Chairman and Vice Chairman.

6.3 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(11)8. Information is also provided by jurisdictions in the annual returns under Implementation Plans (see CNL(11)13 for details).

6.4 Incorporating Social and Economic Factors in Salmon Management

A progress report on the work of the Socio-Economic Sub-Group was presented, CNL(11)15. Over the last twelve months, the Sub-Group has further developed web pages relating to socio-economic values and its proposal for a Special Session on socio-economics to be held during the 2012 Annual Meeting. The objective of the 2012 Special Session is to provide an opportunity for a more detailed exchange of information on how jurisdictions are incorporating socio-economic factors in decisions relating to: management of salmon fisheries; habitat protection and restoration; and aquaculture and related activities. In addition, however, the Sub-Group had recommended that the Special Session should allow for feedback from the Parties on the usefulness of the NASCO Guidelines and discussion of the future role of NASCO in relation to the social and economic aspects of salmon management.

The Council recognised that in view of the external performance review and the 'Next Steps' Working Group there would be limited time available at the 2012 Annual Meeting. However, it agreed that it was important to make progress on this topic and asked the Sub Group to liaise with the NASCO Secretariat on the arrangements for a half day Special Session to be held at the 2012 Annual Meeting. The Council believes that this session would have most value if it included a small number of presentations illustrating different concepts of how socio-economic factors are used in salmon management. The Session should also allow for feedback on the usefulness of the NASCO Guidelines and consideration of NASCO's future work on this topic. The Sub-Group was asked to proceed and develop the programme for the Special Session. The Council suggested that the Sub-Group might wish to consult EIFAAC with a view to its involvement in the Special Session.

The Council agreed that the new web pages should be made publicly available on the NASCO website. The Parties were asked to provide, to the extent possible, by the end of the calendar year updated information for inclusion in the tables relating to 'rod and line' and 'net and trap' fisheries with a view to making these available on the website.

6.5 St Pierre and Miquelon Salmon Fishery

The representative of France (in respect of St Pierre and Miquelon) introduced document CNL(11)16 (Annex 17) containing information on management of the fishery, details of catches and of the number of licenses issued and the sampling programme in 2010. France (in respect of St Pierre and Miquelon) had reiterated that it wishes to retain its observer status to NASCO and to develop scientific cooperation with NASCO given that salmon fishing is a traditional, seasonal activity for the inhabitants of the islands. The Council expressed its appreciation for the information provided and welcomed resumption of the sampling programme, including genetic analyses.

The representative of the NGOs recognised the subsistence nature of the fishery but noted that it exploits salmon of US and Canadian origin including endangered stocks. The NGOs believe therefore that France (in respect of St Pierre and Miquelon) should accede to the NASCO Convention as previously suggested by the Council.

6.6 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.

7. Other Business

7.1 The Secretary advised the Council that he had been approached by the OSPAR Commission concerning the development of an MoU between NASCO and OSPAR. The Council recognised the need for cooperation with OSPAR and asked the Secretary to liaise with OSPAR on the development of a draft MoU to be brought to the Council in 2012.

7.2 There was no other business.

8. Date and Place of Next Meeting

8.1 The Council agreed to hold its Twenty-Ninth Annual Meeting during 5-8 June 2012 in Edinburgh.

8.2 The Council intends to hold its Thirtieth Annual Meeting during 4-7 June 2013.

9. Report of the Meeting

9.1 The Council agreed the report of the meeting.

10. Press Release

10.1 The Council agreed a press release, CNL(11)42 (Annex 18).

Note: The annexes mentioned above begin on page 19, following the French translation of the report of the meeting. A list of Council papers is included in Annex 19.

CNL(11)43

Compte rendu de la Vingt-huitième réunion annuelle du Conseil de l'OCSAN Hôtel Arctic, Ilulissat, Groenland

4 - 6 juin 2011

1. Séance d'ouverture

- 1.1 La Présidente, Ms Mary Colligan (États-Unis) a ouvert la réunion a souhaité aux délégués la bienvenue au Groenland (annexe 1). Ms Ane Hansen, Ministre chargée des Pêches, de la Chasse et de l'Agriculture a prononcé une déclaration de bienvenue (annexe 2).
- 1.2 Les représentants du Canada, du Danemark (pour les Iles Féroé et le Groenland), de l'Union européenne, de la Norvège, de la Fédération de la Russie et des États-Unis d'Amérique ont chacun prononcé une allocution d'ouverture (annexe 3).
- 1.3 La Commission Européenne Consultative pour les Pêches et l'Aquaculture dans les eaux Intérieures (CECPAI) a prononcé une allocution d'ouverture (annexe 4).
- 1.4 Un représentant de l'Association des pêcheurs et chasseurs du Groenland (KNAPK) s'est adressé au Conseil (annexe 5).
- 1.5 Une allocution d'ouverture a été prononcée conjointement, au nom de l'ensemble des organisations non gouvernementales (ONG) présentes à la Réunion annuelle (annexe 6).
- 1.6 La Présidente a exprimé sa reconnaissance pour les allocutions qui avaient été faites et a clos la séance d'ouverture.
- 1.7 La liste des participants figure à l'annexe 7.

2. Adoption de l'ordre du jour

- 2.1 Le Conseil a adopté l'ordre du jour, CNL(11)38 (annexe 8).

3. Questions administratives et d'ordre financier

Rapport de la Commission financière et administrative

- 3.1 La Présidente de la Commission financière et administrative, Ms Sonja Feldthaus (Danemark (pour les Iles Féroé et le Groenland)), a présenté le rapport de sa Commission, CNL(11)5. Fort des recommandations de celle-ci, le Conseil a pris les décisions suivantes :

- (i) accepter la déclaration financière révisée de 2010, FAC(11)2 ;
- (ii) accepter un programme budgétaire quinquennal qui permettrait de définir le budget de 2012 ainsi que des prévisions budgétaires pour la période de 2013-2016. Adopter des programmes analogues à l'avenir ;
- (iii) adopter un budget pour 2012 et prendre acte du budget prévisionnel de 2013, CNL(11)39 (annexe 9) ;
- (iv) nommer soit PricewaterhouseCoopers (PWC) d'Édimbourg, Commissaire aux comptes pour l'an 2011, ou, après consultation auprès de la Présidente de la Commission financière et administrative, toute autre société recevant l'approbation du Secrétaire ;
- (v) adopter le rapport de la Commission financière et administrative.

3.2 Le Dr. Malcolm Windsor se retirera de ses fonctions de Secrétaire le 31 Août 2012. Le Conseil a décidé d'inviter le Dr. Peter Hutchinson à assurer l'intérim pendant un an à partir du 1er septembre 2012. Celui-ci pourrait alors recruter un assistant pour une durée maximale de 12 mois, à compter du 1er janvier 2013. Le Conseil conviendra du processus de recrutement d'un nouveau Secrétaire lors de la Réunion annuelle de 2012.

4. Questions scientifiques, techniques, juridiques et autres

4.1 Rapport du Secrétaire

Le Secrétaire a rendu compte au Conseil des questions suivantes : ratifications de, et accessions à, la Convention et adhésions des membres des Commissions régionales.

Le Secrétaire a également rendu compte de la pêche au saumon dans les eaux internationales effectuée par des Parties non adhérentes à l'OCSAN. À noter qu'il n'y avait eu, depuis le 1er avril 2010 aucune déclaration de ce type de pêche. La surveillance se limitait toutefois aux mois d'été.

Conformément au règlement financier 5.5, le Secrétaire a dressé un rapport sur les contributions de 2011. Elles avaient toutes été perçues. Il n'y avait donc aucun arriéré.

Le Secrétaire a aussi indiqué (CNL(11)19) que, depuis la dernière réunion du Conseil, le Trust de la pêche à la ligne d'Angleterre (*Angling Trust*) avait soumis une demande d'obtention du statut d'ONG. Suite à une consultation auprès de la Présidente, cette demande avait été acceptée. L'OCSAN compte ainsi, à l'heure actuelle, 35 ONG accréditées.

4.2 Rapport sur les activités de l'Organisation de 2010

Le Conseil a adopté le rapport d'activités 2010 de l'Organisation, CNL (11)7, adressé aux Parties conformément à l'article 5, paragraphe 6 de la Convention.

4.3 Annonce du gagnant du Grand Prix du Programme d'encouragement au renvoi des marques

La Présidente a annoncé que M Sergey Kanev, de Murmanskaya oblast de la Fédération de Russie, avait remporté le Grand Prix de 2 500 \$. Le Conseil a présenté ses félicitations au gagnant.

4.4 Recommandations scientifiques du CIEM

M. Gérald Chaput, représentant du CIEM, a présenté le rapport du Comité consultatif (ACOM) au Conseil, CNL(11)8 (annexe 10). Cette présentation figure au document CNL(11)49.

4.5 Pêche menée à des fins de recherche scientifique dans la zone de la Convention

Le Secrétaire a informé le Conseil qu'il n'y avait eu aucune demande faite, en 2011, pour mener une pêche à des fins de recherche scientifique dans la zone de la Convention.

4.6 Rapport de la Commission Internationale de Recherche sur le Saumon Atlantique (CIRSA)

Le Professeur Ken Whelan, Président de la Commission, a présenté le rapport de la réunion de ladite Commission CNL(11)9 (annexe 11).

4.7 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(11)10 (annexe 12), adressée au CIEM.

5. Le Processus «Prochaines Étapes» de l'OCSAN

5.1 Séance spéciale : Etat d'avancement de la stratégie «Prochaines Étapes»

- (a) Tout dernier rapport du Comité de révision chargé du volet de l'aquaculture et des activités connexes

M. Tim Sheehan a présenté le dernier rapport du Comité de révision chargé du volet de l'aquaculture et des activités connexes, CNL(11)11, (annexe 13) lors d'une séance spéciale au cours de laquelle les conclusions de ce rapport avaient été soumises au débat. La présentation de M. Sheehan figure dans le document CNL(11)46. Le Comité de révision avait été chargé d'étudier un FAR soumis par l'UE – Irlande et d'étudier les sections appropriées d'un document fourni par l'UE – Espagne, CNL(10)36. Le Comité de révision n'a pas eu à élaborer de recommandations de meilleures pratiques car, en 2009, une Force Opérationnelle, établie par le Groupe de liaison avait mis au point des « Conseils sur les meilleures pratiques de gestion à adopter pour faire face aux effets nuisibles du poux de mer et des échappés de

saumons d'élevage sur les stocks de saumons sauvages », SLG(09)5. Depuis 2010, le Comité avait entrepris une étude du nouveau FAR soumis par l'UE (Irlande) et rédigé une synthèse des approches scientifiques et de gestion¹ communément employées pour relever les défis auxquels les saumons atlantiques se trouvaient confrontés. Ce travail représentait l'achèvement du mandat de ce Comité. Le Comité avait ainsi méticuleusement évalué le feedback qu'il avait reçu des Parties et revu, dans certains cas, les évaluations de l'avant-projet. Le Conseil a pris note du rapport du Comité de révision et a remercié le Comité pour son travail. L'ensemble des FARs est accessible sur le site Web de l'OCSAN. Lors de la Réunion annuelle, l'UE – Irlande, et l'UE – Suède ont chacune contribué un feedback supplémentaire, CNL(11)47 et CNL(11)48 respectivement.

(b) Rapport du Comité de révision chargé du processus « Prochaines Étapes »

Le Comité de révision chargé du processus « Prochaines Étapes pour l'OCSAN » s'est rencontré au mois de mars 2011 à Boston. Une présentation a été faite du rapport produit par ce Comité au cours d'une séance spéciale, CNL(11)12 (annexe 14).

Le Comité avait passé en revue les progrès réalisés dans la mise en application de l'Approche stratégique par rapport à chacun des sept défis qu'il avait identifiés. Le Comité reconnaissait que l'OCSAN avait agi rapidement en ce qui concernait la mise en place de mesures s'inscrivant dans le cadre de l'Approche stratégique. Celles-ci, cependant, étaient surtout liées à la marche à suivre. Le Comité a ainsi recommandé des initiatives supplémentaires à propos de ces défis. Il a également proposé des commentaires soient obtenus au cours de la séance spéciale de la réunion annuelle de 2011, et ce, afin d'envisager une mise à jour de ladite Approche stratégique.

En ce qui concernait le prochain cycle de rapports, le Comité avait suggéré une rationalisation du processus. Il recommandait également qu'une plus grande attention soit accordée, dans les nouveaux programmes de mise en application, aux activités et actions que chaque juridiction prévoyait de prendre sur une période de cinq ans. Il importait d'insister plus sur la surveillance et l'évaluation des activités qui devraient inclure l'établissement de calendriers et la description claire d'objectifs identifiables et mesurables. Il était recommandé, à l'avenir, de baser les FARs sur des questions spécifiques et d'évaluer les progrès effectués par les programmes de mise en application par le biais des rapports annuels, qui seraient passés en revue. Le Comité de révision avait proposé l'établissement d'un Groupe de Travail chargé d'élaborer un cadre pour les prochains rapports et évaluations. Ce groupe de Travail aurait à rendre compte de ses activités au cours de la Réunion annuelle de 2012.

Le Comité de révision avait également étudié la réponse de l'Association Internationale des Éleveurs de Saumons (AIES) à propos de l'évolution du Groupe de liaison. Il avait ainsi recommandé que le Conseil résolve la question concernant le futur rôle qu'il envisageait l'OCSAN jouer en ce qui concernait l'aquaculture, les introductions et transferts et les transgéniques avant de répondre à l'AIES. La Norvège a soumis un premier document à débattre sur ce sujet, CNL(11)20.

¹ telles qu'elles étaient décrites dans les rapports FARs

(c) Etat d'avancement de la mise en application d'une stratégie de relations publiques

Le Secrétaire Adjoint a présenté les progrès réalisés dans le développement des sites Web de l'OCSAN et de la CIRSA et, notamment, la création de nouvelles pages qui fournissaient des renseignements d'ordre socio-économiques (voir paragraphe 6.4 ci-dessous), ainsi que l'incorporation des informations dans la base de données des rivières. Depuis l'année dernière et suite à une vérification par les juridictions, on avait inclu dans la base de données des renseignements concernant approximativement 1 500 rivières. On anticipait donc qu'une fois complète, la base de données renfermerait des informations sur environ 2 500 cours d'eau. Un travail supplémentaire a été entrepris visant à cartographier l'information. Dès que les pages Web de la base de données des rivières seraient achevées, le Conseil a convenu de permettre aux juridictions de les visualiser sur un site d'essai de manière à ce que les Parties puissent faire parvenir leur feedback au Secrétariat avant que ces pages ne soient diffusées.

5.2 Décisions prises par le Conseil à la lumière des conclusions tirées de la Séance spéciale pourtant sur le processus «Prochaines Étapes» de l'OCSAN»

Le Conseil a décidé de mettre en place un Groupe de Travail qui serait chargé de réfléchir sur la nouvelle forme que devront prendre les plans nationaux. Ce Groupe de Travail serait également chargé, sous la direction de M. Ted Potter (Union Européenne), de mettre en place une trame permettant à l'OCSAN de bien les évaluer et par extension de mieux suivre leur évolution et la progression des actions mises en œuvre. Il serait constitué au minimum d'un, et au maximum de deux, représentants de chacune des Parties et des ONG accréditées par l'OCSAN. Il convenait d'envoyer les noms des participants au Groupe de Travail au Secrétariat avant le 1er juillet. Ces personnes devraient préférablement avoir été impliquées dans la préparation des Programmes de mise en application et des FARs ou avoir participé à un ou plusieurs Comités de révision. Le Groupe de Travail était censé achever son travail avant l'étude externe des performances de l'OCSAN. De plus, il aura à rendre compte de ses conclusions au Conseil lors de la Vingt-neuvième réunion annuelle. Le mandat du Groupe de travail consiste à :

- (a) Élaborer de nouvelles directives concernant la préparation des programmes de mise en application, s'appuyant sur le document NSTF(06)10. Attacher toutefois une plus grande importance à la surveillance et l'évaluation et inclure des critères d'acceptabilité. À inclure également des directives portant sur la préparation des Rapports annuels. Ces instructions devraient décrire le contenu et format de ces rapports, leur date de soumission ainsi que la procédure à suivre et un calendrier de la distribution desdits rapports ;
- (b) Définir la marche à suivre pour l'étude des programmes de mise en application et des rapports annuels ; définir notamment les critères à employer pour ces études, la date de ces examens, la composition des Comités de révision et les dispositifs concernant le compte rendu des études ;
- (c) Mettre au point un programme pour le développement et l'étude des programmes de mise en application, la soumission et l'examen des rapports

annuels, la planification et la tenue de séances spéciales FAR basées sur des thèmes particuliers.

Le Conseil a convenu qu'il étudierait la nécessité de revoir l'Approche stratégique à appliquer dans le cadre des « Prochaines Étapes de l'OCSAN » ainsi que les modifications éventuelles à apporter au calendrier et ordre du jour de sa réunion à la lumière des conclusions tirées de l'examen externe de ses performances. En ce qui concernait le futur rôle de l'OCSAN en matière d'aquaculture, le Conseil a convenu que cette question devrait faire l'objet d'une étude plus approfondie à la lumière du compte rendu du Groupe de Travail « Prochaines étapes » et des conclusions provenant de l'étude externe de ses performances.

5.3 Dispositif concernant l'étude de performances externe

Lors de sa Vingt-septième réunion annuelle, le Conseil avait adopté « un mandat concernant l'examen du processus « Prochaines Étapes » ainsi que la décision prise à propos d'une étude supplémentaire des performances », CNL(10)48. Le Comité de révision "Prochaines Étapes" avait débattu du mandat, des critères à observer par, et du budget nécessaire à une étude externe. À la lumière de ces délibérations, un mandat provisoire avait été défini par le Secrétariat, CNL(11)18. Le Conseil a adopté un Mandat pour la revue externe des performances de l'OCSAN, CNL(11)44 (annexe 15), et pris des dispositions budgétaires pour couvrir les coûts des membres du panel. Le Conseil a accepté la nomination de M. Michael Shewchuk (nommé par la Division des affaires maritimes et du droit de la mer – DOALOS – de l'ONU), Mme Judith Swan (nommée par la FAO) et M. Kjartan Hoydal (Secrétaire de la Commission des pêcheries de l'Atlantique Nord-est – NEAFC). Le document CNL(11)36 contient des informations sur ces candidats. Le Conseil a convenu :

- que le Panel de révision pourrait user des critères se rapportant au mandat comme bon il lui semblait ;
- qu'étant donné les épreuves actuelles que le saumon devait affronter, l'étude devrait examiner les aptitudes de l'OCSAN dans le cadre de son passé, présent et futur ;
- qu'il importait que le Panel de révision compile un rapport qui évaluerait, d'un œil critique les performances de l'OCSAN et qui proposerait des changements et améliorations ;
- qu'il incombait au Panel de révision de décider de la manière dont il devait s'acquitter au mieux de sa tâche, y compris de décider de la nécessité de tenir une seconde réunion ;
- qu'il incombait à la Présidente et au Secrétaire d'apporter un soutien logistique au Panel, dont la mise à leur disposition de tout matériel contextuel et des contacts nécessaires.

6. Conservation, Restauration, Mise en valeur et Gestion rationnelle des stocks de saumon atlantique dans le cadre de l'Approche préventive

6.1 Comptes rendus annuels des Programmes de mise en application

Les Directives du Conseil concernant la préparation des programmes de mise en application et la méthode de compte rendu sur les progrès réalisés, NSTF(06)10, indiquent que les rapports adressés au Conseil doivent être fournis en deux formats : rapport annuel écrit et rapport, sujet à examen, concernant un volet spécifique (FAR) à présenter lors de séances spéciales. L'objectif principal des renvois annuels est de suivre les progrès de l'exécution des actions contenues dans les programmes de mise en application. Une synthèse de ces renvois d'informations a été présentée, CNL(11)13 (les renvois d'informations figurent dans leur intégralité dans les documents CNL(11)21 - CNL(11)35). Le représentant de l'Union européenne a souligné, dans ce rapport, plusieurs évolutions positives.

6.2 Liaison avec l'industrie salmonicole de l'Atlantique Nord

M. Sebastian Belle, Président du Groupe de Liaison, a présenté le rapport de la réunion du Groupe, CNL(11)14 (annexe 16). Il a indiqué que lors de sa réunion du 18 et 19 mars 2011, le Groupe de liaison avait, entre autre, passé en revue le dernier rapport du Comité de révision FAR chargé de l'Aquaculture, les introductions et transferts et les transgéniques (voir 5.1(a) ci-dessus). Le Groupe de liaison avait également étudié les exigences de compte rendu dans le cadre des Conseils MPG, convenu de mesures qui pourraient améliorer la communication du travail du Groupe de liaison, et débattu de l'avenir du Groupe de liaison. En ce qui concernait le rapport du Comité de révision FAR, le Groupe de liaison avait convenu de la réponse suivante :

- Le Groupe de Liaison remerciait le Comité de révision de son rapport (et des 8 annexes), et encourageait les Parties de l'OCSAN de tirer bon parti de la richesse des informations qui y étaient fournies ;
- Quant à l'avenir, et au processus des « Prochaines Étapes », il importait que les Parties de l'OCSAN se penchent avec attention sur les points suivants :
 - l'étendue du rôle de l'OCSAN en matière d'aquaculture, d'introductions et de transferts et de transgéniques ;
 - les rôles et responsabilités des Parties, du secteur salmonicole et des ONG en ce qui concernait le rôle de l'OCSAN ;
 - les activités et études qui permettraient à l'OCSAN de mieux progresser dans son rôle.

Quant aux exigences de comptes rendus à effectuer dans le cadre des Conseils MPG, le Groupe de liaison avait noté que l'examen "Prochaines Étapes" de l'OCSAN étudierait la question des prochains comptes rendus en relation avec chacun des accords de l'OCSAN. Le Groupe avait ainsi convenu de reporter l'étude des exigences de comptes rendus selon les Conseils MPG afin de l'effectuer à la lumière de cet examen. Une proposition émise par le Canada sur la reconstitution du Groupe de liaison a été soumise au débat. Plusieurs options ont été étudiées et l'Association Internationale des Éleveurs de Saumons (AIES) a indiqué, suite à la réunion (voir pièce jointe 1 du

CNL(11)14), qu'elle préférerait s'engager directement avec les Parties en disposant d'un siège lors des Réunions Annuelles de l'OCSAN, tout comme les ONG. Le Groupe de liaison avait également proposé un amendement à sa Constitution de façon à permettre l'élection d'un Vice Président.

Étant donné le processus "Prochaines Étapes" en cours, et l'examen externe des performances de l'OCSAN, le Conseil a résolu qu'il se pencherait, lors de la réunion de 2012, sur la meilleure façon de continuer ses rapports avec le secteur salmonicole, rapports qui lui sont fort précieux. Le Conseil a également convenu qu'il n'était pas nécessaire au Groupe de Liaison de se réunir avant la Réunion annuelle de 2012. Il a par ailleurs accepté l'amendement de la Constitution du Groupe de liaison qui permettrait l'élection d'un Président et d'un Vice Président.

6.3 Nouvelles opportunités ou opportunités naissantes pour, ou menaces contre, la conservation et la gestion du saumon

Conformément à l'Approche stratégique adoptée dans le cadre des « Prochaines Étapes de 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 dans le document CNL(11)8. En vertu des programmes de mise en application, les juridictions avaient également fourni d'autres informations dans leurs renvois annuels (voir CNL(11)13 pour plus de détails).

6.4 Incorporation des facteurs sociaux et économiques dans la gestion des saumons

Un rapport a été présenté sur l'évolution du travail entrepris par le Sous-groupe « Facteurs Socio-économiques », CNL(11)15. Au cours des douze derniers mois, le Sous-groupe avait amélioré les pages Web qui traitaient des valeurs socio-économiques du saumon. Il avait également affiné la proposition d'une séance spéciale sur ce sujet. Cette séance aurait lieu au cours de la Réunion annuelle de 2012. L'objectif consistait à permettre des échanges d'informations plus complets sur la façon dont les juridictions incorporaient les facteurs socio-économiques dans les décisions se rapportant à : la gestion des pêcheries de saumons ; la protection et restauration de l'habitat ; et l'aquaculture et activités connexes. De plus, le Sous-groupe avait également recommandé que la Séance spéciale permette a) d'obtenir un feedback des Parties quant à l'utilité des Directives de l'OCSAN et b) de générer un débat sur le rôle futur de l'OCSAN en ce qui concernait la question des considérations socio-économiques dans le cadre de la gestion du saumon.

Le Conseil a admis qu'en raison de l'examen externe des performances de l'OCSAN et du compte rendu du Groupe de Travail "Prochaines Étapes", il y aurait peu de temps disponible lors de la Réunion Annuelle de 2012. Le Conseil a toutefois convenu qu'il importait de progresser dans ce domaine et a invité le Sous-groupe à contacter le Secrétariat de l'OCSAN quant à l'organisation d'une séance spéciale d'une demi-journée au cours de la Réunion annuelle de 2012. Le Conseil était d'avis que l'on tirerait le maximum de cette séance si elle incluait quelques présentations sur différents scénarios d'application des facteurs socio-économiques dans la gestion du saumon. Il importait que la séance permette également un feedback sur l'utilité des Directives de l'OCSAN en la matière ainsi qu'une évaluation du travail à venir de l'OCSAN dans ce domaine. Le Sous-groupe a été prié d'établir le programme de la

séance. Le Conseil a suggéré que le Sous-groupe pourrait trouver souhaitable de consulter la Commission Européenne Consultative pour les pêches et l'aquaculture dans les eaux Intérieures (CECPAI) en vue de sa participation éventuelle à la Séance spéciale.

Le Conseil a donné son accord en ce qui concernait la diffusion des nouvelles pages sur le site Web de l'OCSAN. Les Parties ont été priées de fournir, au possible d'ici la fin de l'année civile, des informations de dernière minute à inclure dans les tableaux concernant les pêcheries « à la ligne » et les pêcheries « au filet » avant que celles-ci ne soient diffusées sur le site.

6.5 Pêcherie de saumons à Saint Pierre et Miquelon

Le représentant de la France (pour Saint Pierre et Miquelon) a présenté le document CNL(11)16 (annexe 17). Ce document contenait des informations concernant la gestion de la pêcherie, les captures, le nombre de permis octroyés et le programme d'échantillonnage de 2010. La pêche au saumon constituait une activité traditionnelle et saisonnière chez les habitants des îles. De ce fait, la France (pour Saint Pierre et Miquelon) a réitéré le désir de conserver un statut d'observatrice et d'accroître sa collaboration scientifique avec l'OCSAN.

Le Conseil a exprimé son appréciation envers la France (pour Saint Pierre et Miquelon) pour l'information fournie. Le Conseil a également accueilli favorablement la reprise du programme d'échantillonnage, notamment les analyses génétiques.

Le représentant des ONG reconnaissait le caractère de subsistance de la pêcherie, mais a fait remarquer que celle-ci exploitait des saumons d'origine américaine et canadienne ainsi que des stocks menacés. Par conséquent, les ONG étaient d'avis que la France (pour Saint Pierre et Miquelon) devrait accéder à la Convention de l'OCSAN, comme il l'avait été suggéré auparavant par le Conseil.

6.6 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.

7. Divers

7.1 Le Secrétaire a informé le Conseil que la Commission OSPAR l'avait contacté au sujet de l'établissement d'un Protocole d'accord entre l'OCSAN et l'OSPAR. Le Conseil a reconnu la nécessité d'une coopération avec cet organisme et a prié le Secrétaire de rédiger, en rapport avec l'OSPAR, un Protocole d'accord préliminaire à présenter au Conseil en 2012.

7.2 Aucune autre question n'a été traitée.

8. Date et lieu de la prochaine réunion

8.1 Le Conseil a convenu de tenir sa Vingt-neuvième Réunion Annuelle du 5 au 8 juin 2012 à Édimbourg.

8.2 Le Conseil a par ailleurs prévu de tenir sa Trentième Réunion Annuelle du 4 au 7 juin 2013.

9. Compte rendu de la réunion

9.1 Le Conseil a adopté le compte rendu de la réunion.

10. Communiqué de Presse

10.1 Le Conseil a accepté le communiqué de presse, CNL(11)42 (annexe 18).

Note: La liste intégrale des documents du Conseil figure à l'annexe 19.

Opening Statement made by the President of NASCO

Ladies and Gentlemen,

Welcome to the Twenty-Eighth Annual Meeting of NASCO. I would like to thank our Greenland hosts for the wonderful accommodations for our work and also thank the Secretariat for the excellent preparations.

It is appropriate at this critical juncture in NASCO's history that we are meeting here in Greenland where we are reminded of the important role of Atlantic salmon culturally, economically, and as a critical component of the riverine, estuarine and marine ecosystem. International cooperation and collaboration to improve our understanding of Atlantic salmon and our collective ability to utilize scientific information to manage the species in a sustainable manner has never been more critical than it is today when some populations have been extirpated and others remain at critically low levels.

The Contracting Parties and NGOs should be proud of the successful effort to fund the SALSEA program. This international collaborative science program could not be undertaken by any one party and could only be accomplished when the Parties identified this as a priority and combined resources. We are now looking forward to the October 'Salmon Summit' to learn about the progress that has been made and ideally identify priorities for future management and research efforts. This is just one example of how NASCO, its Contracting Parties and NGOs have risen to address the significant challenges facing Atlantic salmon.

At this year's annual meeting we will be receiving the final report of the FAR Review Group on Aquaculture, Introductions and Transfers and Transgenics which will complete the first cycle of reporting under the 'Next Steps' process. It is my view that the FAR Reports and review process have greatly increased our understanding of issues and activities in jurisdictions, but that we have failed to take full advantage of the opportunity to critically challenge each other and ourselves to advance our knowledge and raise management standards to a higher level.

We will also receive and discuss the report from the 'Next Steps' Review and I hope we will have a very active discussion in the Special Session focusing on whether the process has accomplished what was intended and how it can be improved. We should critically examine whether NASCO is more transparent and if the Contracting Parties are more accountable for actions taken at home and consistency with the agreements reached at NASCO. We should question what changes could be implemented to make even further progress. The Next Steps process was always intended to be iterative, and we must learn from our experiences to date and adapt for the future.

In reviewing the 'Next Steps' process it is important to remember where we were before we started the process. Prior to the implementation of the 'Next Steps' actions, there was considerable distance between the Contracting Parties and the NGOs and discussions and decisions were more likely to take place outside of the main meeting room. The 'Next Steps' process has resulted in greater collaboration between the Parties and the NGOs, which will benefit Atlantic salmon and there are greater opportunities for full participation during the

annual meeting. While, in my view, great progress has been made, this is not the end point. The evolution of NASCO is a process that requires constant review, feedback and, of course, correction.

While much of our discussion over the past few years and at this year's meeting is focused on changes to how we exchange information and evaluate progress, we must not lose sight of the strong foundation and practice in NASCO of seeking the best available scientific information and using that information to make management decisions.

We have a great deal to accomplish over the next three days. We need to complete our internal review of the 'Next Steps' process and agree on procedures for the external review. These are critical decisions for the future of NASCO and of Atlantic salmon.

I look forward to challenging and informative discussions and debates over the course of our meeting and thank you all for your participation and for your commitment to the conservation of wild Atlantic salmon.

***Welcoming Address made by The Honourable Ane Hansen,
Minister for Fisheries, Hunting and Agriculture, Government of Greenland***

Madame President, Distinguished Delegates, Observers, Ladies and Gentlemen

Good morning

It is a great pleasure for me here today to welcome you all to Greenland to this spectacular city, Ilulissat. It is indeed a great pleasure for Greenland to host the Twenty-Eighth Annual Meeting of the North Atlantic Salmon Conservation Organization here in Ilulissat.

Ilulissat is a unique place in the world with its fantastic Icebergs and glaciers through which the Greenland Ice cap reaches the sea. You now find yourselves about 250 km north of the Arctic Circle.

Back in 2004, Ilulissat Icefjord was admitted onto UNESCO's World Heritage List. This certainly indicates that the entire world sees a need to protect these natural heritages against destruction.

Besides having a spectacular nature, Ilulissat is one of our most important places for tourism. Fishery is also of great economic importance here, in particular fishing for Greenland halibut.

Greenland has once before, back in 1997, hosted a NASCO Annual Meeting – to be precise - the Fourteenth Annual Meeting – in exactly the same place as we are here today. I believe that those of you who were here at that time recall the beauty of Ilulissat, but also have noted that the hotel is different with much more modern facilities.

Greenland has been a member of NASCO ever since Greenland withdrew from the European Community back in 1985. In NASCO as well as in many other Regional Fisheries Management Organisations (RFMOs) Greenland cooperates very closely with the Faroe Islands, and we normally act as one single party as Denmark in respect of the Faroe Islands and Greenland.

Greenland recognizes the objectives of the organisation and appreciates that cooperation, conservation, rebuilding of stocks and sound management are all very important elements for ensuring sustainable fisheries on the stock.

I firmly believe that Greenland in this respect has done its utmost by introducing measures to limit catches. As you know, Greenland has not allowed any commercial fisheries for salmon in our waters since 2002. We also, at the same time, introduced a ban on export of salmon. However, we do maintain a so-called subsistence fishery which in a global context is insignificant, but nevertheless of great importance for our people.

Only one single and small stock of Atlantic salmon is native to Greenland. The stock is located at the creek of Kapisillit, further south of this place. Greenland is fishing on a so-called mixed stock which is composed of salmon originating from North America and from Europe. I realise this gives rise to critical remarks.

In this context I would encourage other parties to carefully look at their home water fisheries and consider whether additional management measures are necessary for these fisheries. Certainly, it is both desirable and necessary that all parties involved cooperate in a constructive way with a view to finding long term solutions for sustainable salmon fisheries.

I'm well aware that the stock situation, despite many sacrifices over the years, is still on a low level and, of course, the low abundance is of great concern to all of us.

Our fishermen have, in particular over the last three – four years, continuously reported of higher salmon abundances in our waters.

These observations have led to a demand from our fishermen to re-open our commercial fishery for salmon. If our fishermen in the years ahead still report back of increased abundance, we might contemplate introducing regulations and measures to allow for re-opening of a commercial fishery at a sustainable level for the Greenlandic market.

Over the past three years, Greenland has been part of an extended research programme with valuable contributions from the USA, Canada and the EU. The scientists involved are in Greenland taking samples and doing research during the fishing season. We highly appreciate taking part in this research work and believe that it brings us a much more comprehensive understanding of the nature of this fishery. We hope the cooperation in this field can continue in future years. We are committed to this work and hope also that KNAPK will facilitate and continue its cooperation in this field.

From the agenda, I see you have many important issues to address in the days ahead. I wish you every success in your work and I am confident that your efforts will bring this 28th Annual Meeting of NASCO to a successful conclusion.

I also hope you would allow yourself some time to take a closer view of the city and the beautiful surroundings here and climate changes. It is my sincere hope that you on your return to your home countries safe and sound and will recall good memories from the NASCO 28th Annual Meeting.

I know that a boat trip and a walking tour have been arranged. Unfortunately, even if we so wished, we cannot take you to a salmon river, as we have only one small salmon creek many miles away from here.

Tonight, I have the pleasure on behalf of the Government of Greenland to host a dinner, and I hope you all accept my invitation.

Finally, I would like to hand over to you a little book gift to remind you of the 28th NASCO Annual Meeting and the beautiful surroundings of Ilulissat.

I wish you a successful meeting.

I welcome you all.

Thank you.

Opening Statements made by the Parties

Opening Statement made by Canada

Madame President, Distinguished Delegates, Observers, Ladies and Gentlemen:

I am pleased to be here and to represent Canada for the first time at a NASCO annual meeting. I would first like to thank our hosts for inviting us here to this extraordinary setting in Ilulissat and for providing such an excellent meeting facility.

All along the Atlantic Coast of Canada, wild Atlantic salmon are found in rivers from the US border at the mouth of the Bay of Fundy to the north of Nain, Labrador, as well as in Ungava Bay. Wild Atlantic salmon is an essential resource of significant cultural and economic importance to many coastal communities across Atlantic Canada.

Canada's concern for the conservation of wild Atlantic salmon is paramount. In November 2010, the Committee on the Status of Endangered Wildlife in Canada (better known as COSEWIC) assessed the status of wild Atlantic salmon in Canada. For those of you unfamiliar with COSEWIC, it is a committee of experts that assesses and designates which wildlife species are in some danger of disappearing from Canada.

Of 16 Designatable Units in eastern Canada, COSEWIC drew the following conclusions: Five wild Atlantic salmon population segments have been assessed as endangered, one as threatened, four as of special concern, one as extinct, four as not at risk and one data deficient.

Suffice to say, we face a challenging road ahead to conserve and restore wild Atlantic salmon stocks.

Continuing efforts to improve our understanding of the biology of wild Atlantic salmon is crucial to supporting its conservation. The cooperative scientific research and exchange of information on Atlantic salmon by the Parties and accredited observers around this table, including in support of the SALSEA research program, is very important to Canada. We are eagerly awaiting the results of SALSEA and believe that the results of the research program will improve our understanding of the biology of Atlantic salmon, including the carrying capacity in the North Atlantic Ocean to produce salmon, an issue which is of particular interest to Canada and NASCO.

We hope that our cooperation through NASCO, our cooperation with ICES and with NGOs, will enhance our capacity to address the conservation of salmon stocks.

While we await the results of the SALSEA research program, we must balance our efforts and focus on issues we can control to increase returns such as habitat conservation and recovery initiatives in freshwater and near-shore environments.

Habitat conservation and recovery initiatives are important aspects of Canada's Wild Atlantic Salmon Conservation Policy. The policy reinforces the federal government's commitment to conserving wild Atlantic salmon in Canada's coastal and inland waters. A Working Group, comprised of Federal and Provincial officials, First Nations and NGOs has recently developed an action plan to implement the Wild Atlantic Salmon Conservation Policy. This is a significant step forward for the conservation of wild Atlantic salmon in Canada that would not have been possible without the active engagement and participation of stakeholders.

Canada looks forward to continued engagement with our stakeholders throughout the implementation of the action plan.

Turning to the business we have this week, several items on our agenda for the next three days are focused on the future direction of NASCO. We believe that the 'Next Steps' Process has been a valuable and worthwhile endeavour and that this process will also be viewed as such by those we appoint to the external performance review panel.

A formal, independent, external review process for identifying the strengths and weaknesses of the organization is an extremely useful and positive undertaking. Once we have approved the work plan for the external performance review this week, I expect this performance review to showcase many of the positive and cooperative programs the organization has undertaken throughout its history. At the same time, it will be important to assess whether NASCO is continuing to meet its objectives and to highlight any areas where reform or modernization may be required.

I look forward to working together with you this week and trust that we will have constructive discussions which will prove beneficial for all involved.

Thank you.

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

Madame President, Distinguished Delegates, Observers, Ladies and Gentlemen

I would like to start by saying, on behalf of the Greenlandic delegation, it is a great pleasure for Greenland to host the 28th Annual Meeting of the North Atlantic Salmon Conservation Organisation here in Ilulissat.

I would also like on behalf of both the Government of the Faroe Islands and the Government of Greenland to warmly welcome you all here today. Unfortunately, due to other important commitments back in the Faroe Islands, our colleagues from there will not be able to be here with us this week.

Madame President, since the last Annual Meeting important preparation for this annual meeting has taken place, and unfortunately, neither Greenland nor the Faroe Islands were able to participate in the 'Next Steps' meeting earlier this year. My delegation recognises the outcome of this meeting and can certainly concur with many of the conclusions drawn.

We certainly welcome the proposal to establish a Working Group to look at how the current reporting format can be streamlined and developed so as to capture all relevant information of the nature of this fishery.

At the last Annual Meeting it was agreed to conduct a performance review of NASCO similar to reviews conducted by other important RFMOs. We look forward to having this process initiated shortly, and we look forward to receiving the results and to take appropriate actions with a view to strengthen the organisation.

We also recognise, Madame President, that a comprehensive review cannot be conducted without imposing additional cost on the organisation. We should be prepared to allocate the necessary resources for that work, and hopefully, the review will prove cost efficient in the long term.

We have noted with concern that the recent biological advice, despite measures taken by the different parties to lower the outtake of salmon in coastal waters, does not look encouraging for the rebuilding of the stock.

In this context, let me remind all parties, that both the Faroe Islands and Greenland have imposed severe restrictions on their fisheries for many years.

We still see that by far the main parts of the catches are taken in coastal waters and estuaries. Our fisheries on the mixed stock only represent an insignificant activity. Madame President, we have said it many times before, but nevertheless, I will reiterate our view again today that the homewater fisheries should be regulated by NASCO.

We firmly believe that such a step could be one way to rebuild the stocks and eventually lead to re-opening of salmon fisheries in Faroe Islands and in Greenland. Pressure from our fishermen to open up for commercial fisheries is growing day by day.

Before closing, I would like to finish by bringing very warm regards from our previous delegate to NASCO and President of NASCO, Mr. Einar Lemche. Back in 1997, when Greenland first hosted the NASCO Annual Meeting, Mr. Lemche was here in this same hotel in his capacity of President for this organisation.

I can inform you that Mr. Lemche retired from his duty a few years ago and he lives north of Copenhagen. Mr. Lemche still keeps a close eye on NASCO and I can assure that Mr Lemche would have enjoyed being back here for this event to have a “scent” of NASCO, but not least to see former colleagues and friends.

Finally, Madame President, our delegation looks forward to working with you and all other parties this week. We are confident that this meeting in your skilful hands, Madame President, will bring us to a successful conclusion.

Thank you

Opening Statement made by the European Union

Right Honourable Minister Hansen, Madame President, Distinguished Delegates, Ladies and Gentlemen.

On behalf of the European Union and its Delegation, I would like to thank Denmark, and in particular the Home Government of Greenland, for hosting the 28th Annual Meeting of NASCO, this week, in Ilulissat. We cannot think of a more spectacular setting for a meeting, and I am sure that we will find it hard to maintain our concentration when dealing with the issues at hand during the meeting.

This year we have to continue our deliberations on some issues from last year, in particular the development of a risk-based management approach for the Faroe Islands fishery. This work should enable NASCO to apply similar measures in the West Greenland and Faroe Islands fisheries, once commercial fishing activities hopefully become viable under NASCO objectives. For this, we have to thank the ICES Salmon Working Group for the work that it has undertaken and material that it has produced. This will enable a science-based discussion to take place. However, we do have to note, with regret, the absence of the Delegation from the Faroe Islands to this meeting. Without the participation of the main interested party in this fishery it is very difficult to have any conclusive discussion, or make any significant progress at this time. We sincerely hope that the Faroe Islands administration will fulfil its undertaking to continue this work in the intersessional period, and notably by participating in a possible special meeting of the NEAC.

The information in the ICES Scientific Advisory Committee report appears to be promising, as there has been an increase in catches of wild salmon in 2010, which we hope is a result of improved abundance rather than as a result of improved reporting. This may well be a reflection of the efforts that Parties have made, notably as regards the reduction of the mixed stocks fisheries in some jurisdictions, and we would hope to see this effort reciprocated by an improvement in the degree of the catch and return from the rod fishery, which we note is variable depending on jurisdiction.

In light of this promising information from ICES and the increased wealth of knowledge flowing from the SALSEA project, we can also provide a clear illustration of the progress in the sustainable management of Atlantic salmon, underlining the advances that can and have been made by the different jurisdictions on this issue, which are fully in line with NASCO's objectives. I would like to highlight this recent example from the Irish jurisdiction.

In Castlemaine Harbour, Co Kerry, on the basis of the results of a detailed pilot study undertaken last year, it has been possible to consider the reopening of a public commercial fishery on mixed stocks without the risk of jeopardising the contributing stocks from individual rivers, each of which are meeting their individual conservation limits. The additional information supporting this re-opening was gathered from a comprehensive monitoring programme covering the duration of the season, and all areas of the Castlemaine harbour, thereby covering both the temporal and spatial presence of the stocks concerned. This was also supported by genetic sampling of fish during 2010. If requested, we can provide further information on this action.

Later today, we will have the Special Session where we will have the presentation of the final report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group. Earlier this year the NASCO/Industry Liaison Group meeting was held in Boston. It was very constructive and co-operative. We would like to welcome the approach taken by the industry in re-affirming its commitment to the international goals in the Best Management Practice Guidance and the progressive way that they will strive to achieve this. It should be remembered that absolute goals cannot be achieved overnight, it takes time to arrive at the final destination.

The Special Session will provide an opportunity for all those concerned in the aquaculture sector, be they from administrations or industry, to have a final opportunity to respond to the FAR Report. I am certain that this will provoke some comments and provide the opportunity, if necessary, for corrections of possible inaccuracies. In addition to the aquaculture sector's presence at the Special Session, I think that it is appropriate to encourage the participation of the aquaculture industry representatives in NASCO meetings, as we do with NGOs, to enable NASCO to have a view of the whole picture regarding aquaculture.

Madame President, before closing I would like to wish you every success for this Annual Meeting, and assure you that the EU will play its part in the forthcoming discussions willingly and openly with the other Delegations, so that NASCO will come to the appropriate decisions at the end of the meeting to further the moves towards the improved conservation of the wild Atlantic salmon, which we have seen from the example I provided earlier, is achievable. I would also like to thank the Secretary, Malcolm, and his team for the excellent work in preparing this meeting, and thank them in advance for the hard work and long hours that they will put in before the end of the meeting. It is much appreciated.

Thank you.

Opening Statement made by Norway

Minister, Madam President, Distinguished Delegates, Observers, Ladies and Gentlemen:

On behalf of Norway, I would like to thank Greenland for hosting the Twenty-Eighth Annual Meeting of NASCO, and once again giving us all the truly spectacular experience of 'The Fjord of the Icebergs' - Ilullissat.

NASCO has through the years been of vital importance for improving management and conservation of Atlantic salmon among its member countries. Implementation of the Precautionary Approach in Salmon Management has been one of the important undertakings by NASCO. This has been a fruitful strategy that already has proven its worth in the management of wild salmon.

In Norway, the advances in NASCO have led to improvements in most aspects of Atlantic salmon management. At this Annual Meeting the 'Next Steps' will be in focus, and the Norwegian delegation looks forward to strategic discussions of what the organization shall focus on and its working form, in the coming years.

Pre-Fishery Abundance in Norway was at a historically low level in 2010. Nevertheless, the spawning escapement was maintained on an adequate level in most rivers due to restrictions on the fishery.

Both river fisheries, coastal fisheries and most of the fjord fisheries for Atlantic salmon in Norway were further restricted from 2010 on. However, mixed-stock fisheries in the sea and in some large rivers, not least in the river Teno, still need attention, and this also applies to the interceptory fishery in the sea. With regard to the latter, the Norwegian delegation will invite relevant NASCO members for discussions in the course of this meeting. For your information, Finland and Norway have agreed to start negotiations on the bilateral agreement on fishing in the river Teno this autumn.

A risk assessment on environmental impacts of Norwegian fish farming has been published this year. The document gives an assessment and evaluation of different challenges from aquaculture.

A comprehensive quality standard for wild salmon stocks has been suggested. The quality standard encompasses both spawning targets, criteria for genetic integrity and limits for exploitation. The document contains considerations of both quantitative and qualitative nature, and is now subject for debate in Norway.

Madam President, in closing I would like to thank our hosts and the Secretariat for excellent preparations for this meeting. The Norwegian delegation looks forward to a productive and successful meeting.

Opening Statement made by the Russian Federation

Madam Minister, Madam President, Distinguished Delegates, Observers, Ladies and Gentlemen!

On behalf of the Russian delegation I am pleased to greet all participants of the 28th Annual Meeting of NASCO here in Greenland.

First of all, I take this opportunity to thank Greenland for hosting this meeting in this beautiful place which is renowned in the world on account of its proximity to the picturesque Ilulissat Icefjord. We are also very pleased by the splendid arrangements made for us in Ilulissat which, as we know, means icebergs in Greenlandic!

Atlantic salmon, often described as ‘a symbol of a healthy ecosystem,’ has a high socio-economic value in northern countries both through commercial and subsistence coastal fisheries and recreational fisheries in rivers.

However, the extensive salmon migrations between open sea and home rivers pose a major problem for fish managers regulating fisheries in different areas. While the river fisheries mainly exploit river-specific stocks, the coastal fisheries inevitably exploit a mixture of stocks from widely different areas, including fish from neighboring countries. This is a problem, as the coastal mixed-stock fishery can simultaneously exploit salmon from both healthy and struggling stocks.

Physiographically, Greenland is a part of the continent of North America. Unfortunately, there has been a dramatic decline in the Atlantic salmon stocks all over the Atlantic region of North America. The status of individual river stocks varies considerably and many salmon stocks are suffering reduced numbers of spawning salmon. Therefore, better targeted management measures should be developed and implemented for the mixed-stock fishery in coastal areas.

One strategy to protect the wild salmon stocks is to reduce landings and to enhance recreational fishery based on catch-and-release principles. In the Russian Federation the reduction of commercial fishing effort in the 1990s was aimed at conserving Atlantic salmon stocks and enhancing the recreational fishery which nowadays is renowned in the world as one of the highest quality and most prestigious in the North Atlantic. In Russia, rational management of Atlantic salmon stocks couldn't be productive and fruitful without NASCO's recommendations which cover the whole range of the problems relating to conservation and management of Atlantic salmon.

This year Norway, Russia and Finland started a new project: ‘Trilateral cooperation on our common resource: the Atlantic salmon in the Barents region’ (Kolarctic Salmon), which aims to merge modern science with traditional salmon fishing knowledge to create a future sustainable, long-term and knowledge-based salmon management regime for the Atlantic salmon stocks of the Barents region. The project is a joint venture between management, research, salmon fishing organizations and salmon fishermen in the participating countries. We hope that the results from this cooperative initiative will ensure the conservation and sustainable use of stocks allowing the introduction of the best possible constraints for the respective fisheries of fishery owners and traditional coastal fishermen.

Atlantic salmon is a national treasure in any country. And we realize that without international cooperation in conserving this resource, without combined efforts in developing a strategy for future actions one could hardly expect to be successful. Therefore, we do not have doubts that the work that will be accomplished in the course of this Annual Meeting will contribute to the preservation of this valuable species for future generations.

And in conclusion, I would like to thank Greenland for hosting this Annual Meeting once again for hospitality, and wish all of us success in working together during this week. Madam President, my delegation is looking forward to having important and fruitful discussions during this meeting.

Thank you for your attention!

Opening Statement made by the United States of America

Madame Minister, Madame President, Distinguished Delegates, Members of the Secretariat, Observers, Ladies and Gentlemen:

On behalf of the United States, thank you to our Greenlandic hosts for their excellent accommodations for the Twenty-Eighth Annual Meeting of NASCO in this awe-inspiring location. Although I must admit it is a bit of a shock to come from approximately 30 degrees Celsius at home to a view of snow and icebergs.

Since the last NASCO meeting in Quebec City, the United States has taken significant measures to reverse the alarming declines in wild Atlantic salmon abundance trends in our rivers. We are fortunate in the United States to have a diverse group of supportive stakeholders assisting us with Atlantic salmon recovery efforts. Three significant dams were removed from important salmon rivers in 2010, and we look forward to 2012 when the first of three mainstem dams on the Penobscot River will be removed. In addition, we have been working with a number of science partners to enhance our understanding of the factors leading to the declines in marine survival affecting US stocks. We look forward with great anticipation to the 'Salmon Summit' in La Rochelle, France in October of this year. The US will be presenting information from several research initiatives and also looks forward to receiving new research findings from other partners throughout the salmon's range. It's our hope that the information that is exchanged at the Summit can and will be applied by the Parties in the near term in a management context.

This year NASCO continues the good work initiated through the 'Next Steps' process to increase collaboration, accountability and transparency within the Organization and among its Parties. At this meeting, we are completing the first cycle of the 'Next Steps' process and embarking on a further performance review of how NASCO and its Parties have conducted the important work of the Organization. There are clearly some important decision points ahead. We look forward to working with and ultimately receiving the findings of the review panel. We are confident that their findings and recommendations will build on the strong foundation of increased openness and inclusiveness generated through the 'Next Steps' process and that this review will help NASCO and its Parties improve our roles as we work through the many challenges facing the wild salmon in the North Atlantic.

In 2009, the West Greenland Commission adopted regulatory measures, which would also apply in 2010 and 2011, if there was no significant change in the Framework of Indicators developed by ICES. As in 2010, the Framework of Indicators Review Group has concluded that there was no significant change in the indicators used and, as a result, the agreement to limit catch at West Greenland to internal consumption will continue. We are grateful for Greenland's strong commitment to rebuilding these stocks. Since the US ceased all fishing for Atlantic salmon several years ago, we have some understanding of and acknowledge the sacrifices of the Greenlandic people in this regard. Although we will not be negotiating measures for West Greenland until next year's annual meeting, we hope at this meeting to continue a collaborative dialog on responsible fisheries management with an eye toward a future of healthy, productive stocks of Atlantic salmon.

Madame President, thanks again to our hosts, to you and to the Secretariat for the facilities provided and for the excellent preparations for this meeting. The US looks forward to working with you all this week to ensure a productive and successful meeting.

***Opening Statement made by the European Inland Fisheries and Aquaculture
Advisory Commission (EIFAAC)***

I am grateful for the opportunity to represent the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC) as an observer at the 28th Annual meeting of NASCO.

EIFAAC is a statutory, advisory body of the Food and Agriculture Organization (FAO) of the United Nations. Established in 1957, it is an inter-governmental forum for collaboration and information exchange on inland fisheries and aquaculture across all European countries. EIFAAC currently has 34 members. Governments, institutions and agencies; including NASCO, can benefit from international advice derived from the EIFAAC's network of policy-makers, managers, scientists and others working on inland fisheries and aquaculture issues.

A coordinated international approach to the resolution of fisheries management issues has increased in importance as we see ever increasing pressures and rapid changes in our ecosystems. EIFAAC has a major role in the provision and dissemination of best practice advice to the inland fisheries sector and its stakeholders. In order to meet the dynamic requirements of member states and stakeholders, EIFAAC has gone through its own 'Next Steps' programme. This process has resulted in the development of a new structure for the organisation which takes a focused project-based approach to the development of advice and research programmes under the guidance of a technical/scientific and management committee.

EIFAAC's mission is to promote the long-term sustainable development, utilization, conservation, restoration and responsible management of European inland fisheries and aquaculture and to support sustainable economic, social, and recreational activities through:

- providing advice and information;
- encouraging enhanced stakeholder participation and communication; and
- through the delivery of effective research.

Formal adoption of the new EIFAAC rules of procedure is expected to be approved by member states at an EIFAAC Special Session in October.

EIFAAC and NASCO share the common goal of wild Atlantic salmon conservation while respecting the social, economic and cultural value of this unique species. It is, therefore, very much appreciated that NASCO extends EIFAAC an invitation to observe at this meeting. In return EIFAAC offers NASCO its technical and scientific resources to support research or advice pertaining to salmon in its fresh water environment.

Thank you kindly for your attention.

***Address by Kalaallit Nunaani Aalisartut Piniartullu Kattuffiat
(KNAPK - The Association of Fishermen and Hunters in Greenland)***

I am proud to welcome you all to:

- the home of growing numbers of wild North Atlantic salmon;
- one of the cleanest waters of the world where the wild Atlantic salmon can find its most important feeding grounds and enjoys its stay with us;
- the place where responsible professional fishermen in Greenland, members of KNAPK, have done a lot to restore the wild North Atlantic salmon;
- the place where the wild Atlantic salmon is present all year around.

I hope that before you leave you will be able to help benefit the professional fishermen who are members of KNAPK by giving us approval to utilize the increasing numbers of wild Atlantic salmon in our waters.

Thanks to the North Atlantic Salmon Fund and to the Atlantic Salmon Federation, the members of KNAPK have individually helped the restoration of wild Atlantic salmon numbers by agreeing not to fish salmon but to concentrate on other species. For instance the lumpfish fishery in Greenland is now biggest in the world.

This has only been possible through generous funding donated internationally by private individuals over the last 20 years.

This cooperation between our fishermen and conservationists has resulted in growing numbers of wild Atlantic salmon. The observation that this is the case comes from our members along the coast. These fishermen are now reporting to our headquarters that wild Atlantic salmon are being seen and caught occasionally as a by-catch during the winter months of December, January and February. Last summer the fishermen also noted that there were so many salmon in August and September that the numbers resembled the 1970s when there were catches by commercial fisheries. Some of our members, further north for instance in the Kangarsuatsiaq – community in the Upernavik area 72 degrees north, have asked the organization to open the way for an experimental fishery of wild Atlantic salmon. Another fisherman in Qaqortoq reported that he caught more than 20 salmon in February 2010, under the ice, while trying to fish Greenland halibut and cod.

Those are some of the reasons why our members are now asking for commercial fisheries of wild Atlantic salmon to be reopened.

Last year, we presented this request in a formal letter to our government.

Some members of our local branches in Ilulissat have arranged a demonstration and you will be able to meet them during the first break this morning.

Please show your interest by taking the opportunity to meet with the fishermen face to face during the break and take a minute to talk to them.

While professional fishermen in Greenland have voluntarily restrained from catching wild North Atlantic salmon commercially directly and indirectly based on decisions by NASCO, other fishermen in Norway, Scotland, Ireland and Canada have been given approval by the same organization to fish the wild North Atlantic salmon in their waters.

This is fundamentally unfair and no longer acceptable to our members in KNAPK.

There ought to be the same set of principles, same science, rules and opportunities given to all members of NASCO instead of dividing members into two groups of nations – one being Greenland and the Faroe Islands who have also done much to allow the wild stocks of north Atlantic salmon to grow in numbers and the other privileged group being those who are allowed to have commercial fisheries in their coastal areas.

More and more we hear suggestions that a new Salmon Treaty is necessary, a new Treaty where every nation has an equal standing.

We propose that this should be changed as follows:

- It must be scientifically demonstrated that rivers of origin are clean and not polluted. I think we all can agree that salmon will spawn much more successfully in clean rivers. We must consider the whole life cycle completely pollution free in the fresh water as well as in the sea water.
- We have lately heard of more farmed salmon escaping from their cages. This allows them to mix with the wild salmon stocks and results in the wild Atlantic salmon getting more sea lice problems and potentially genetic confusion.

Therefore, the KNAPK and our members are asking you honorable guests and delegates to support our need and right to catch and use the North Atlantic salmon – not only for subsistence purposes but also for commercial use. We would find it hard to understand a lack of support for this demand from you because the rationale behind our efforts for the restoration of stocks was based on our need to utilize the wild Atlantic salmon.

It will be very hard for me to explain to many of our members why they have been doing all they can to restore the wild stocks but are not allowed to make commercial use of the stocks now they have improved.

On behalf of our more than 1.900 members I propose that members of NASCO give Greenland a quota of wild North Atlantic salmon for commercial use already this year.

We are proud that our members together with our conservation partners have helped the wild stocks of North Atlantic salmon to grow in numbers everywhere, in Greenland and in all other salmon countries. It is now time for us to enjoy some recompense for these efforts.

Give Greenland a quota of wild Atlantic salmon for this year. If not, KNAPK will strongly insist and advice the Government of Greenland to leave NASCO.

We are all depending on a clean environment. Please understand that the salmon is especially dependent on a clean environment.

I am delighted to welcome you to what is still one of the cleanest waters in the world where the salmon is happy to stay and grow.

I hope you will enjoy your stay in Ilulissat and I wish you good results of your meeting.

The necessary actions are in your hands.

Opening Statement made by the Non-Government Organizations

Minister Hansen, Madam President, Colleagues

I am pleased to present the joint opening statement on behalf of the NGO Group. I do so as deputy to Chris Poupard, who sends his apologies for not being able to attend this year, and wishes us well for a positive and successful meeting. You will also note a much smaller NGO delegation than normal, notwithstanding the significance of the issues facing us here, but due mainly to costs and travel restrictions; however pre-meeting discussion has taken place to enable me to present a united NGO position today.

First of all, we would like to thank the Greenland Government delegation for hosting this year's meeting in these stunning Arctic surroundings, and for extending such a warm welcome to us all. It is opportune that we are in Greenland for this crucial stage in the 'Next Steps' process, for this is a country that, despite a worrying increase in the internal catch in 2010, has sacrificed more than most to conserve wild Atlantic salmon. It is ironic, therefore, that while enjoying the Greenlanders' hospitality some 27 years after NASCO's inaugural meeting, we still have, as Minister Hansen and our Greenland colleagues suggested, Parties at this table supporting homewater mixed-stock fisheries. Some also support poorly regulated and operated fish farming industries, and policies within their freshwater environments, many of which impact adversely on wild salmon populations rather than offering them the protection this forum demands. The results of the FAR reviews show that much remains to be done to align management measures by the Parties with NASCO agreements

The ICES advice for this year's salmon fishery is that there is no opportunity for mixed-stock exploitation on any of the stock complexes, a situation likely to extend until at least 2014. ICES continues to urge that mixed-stock fisheries present particular threats to stock status, yet tens of thousands of salmon are still caught each year in homewater fisheries, principally in Norway, Scotland and England. And although we greatly appreciate the continuing conservation measures undertaken by several parties, particularly the USA, Ireland, the Faroes and Greenland, too many countries continue to ignore the best available scientific advice on wild salmon exploitation, and fail to implement NASCO agreements regardless of the fact that NASCO's fundamental principle remains the Precautionary Approach.

And ICES is not concerned exclusively with problems in the marine environment. Once again, the organisation warns that due regard should be given to environmental issues when planning renewable energy schemes, and in-river hydropower projects are a particular worry, as is fish passage and the ability of migratory salmonids to reach all available spawning and nursery habitat within individual river systems.

Madam President, the NGOs wish this to be the year when NASCO's focus returns entirely to the conservation of wild Atlantic salmon, for we believe that too many Parties still see the support of competing commercial interests, such as aquaculture, as more politically expedient than driving measures to ensure a sustainable future for this iconic natural resource.

We look forward, for instance, to the final report of the Aquaculture FAR Review Group, and to Parties acknowledging the failures identified. In 2009 Best Management Practice (BMP) Guidelines were agreed which established the important principle that wild salmon should be

free from the additional pressures posed by increased lice burdens and the impacts of farmed escapes. We still await the implementation of that principle.

The future of the Liaison Group is up for discussion, and the NGOs have concerns about its value. There are still fish farming representatives that agreed the BMP Guidelines, only to return home and for their organisations to continue to deny any impact on wild Atlantic salmon. This is unacceptable, especially in the light of the ICES report which confirms that, for example, in Norway throughout 2010, lice levels were on average higher than the previous year. This, together with the increase in geographic spread of incidences of treatment failure and resistance, gives ICES ongoing cause for concern, and so it should for everyone sitting in this room.

Madam President, the NGOs have regularly lobbied for Convention change so that NASCO resolutions become binding on all parties in their management policies at home, and this remains our ultimate objective. It is no accident, for example, that binding EU Directives have had the most significant impact on wild salmon conservation in NEAC over the last 5 years. However, our short term concern is for the immediate future of 'Next Steps', which has so far focused on process.

We see it as imperative that the next Implementation Plan cycle picks up the failures of the first round of Focus Area Reviews, and concentrates on measurable outcomes, which can be scrutinised within Special Sessions at future Annual Meetings. This would at least put more pressure on Parties to abide by their responsibilities under NASCO, adopting the Precautionary Approach and making salmon conservation their foremost priority.

Finally, Madam President, although our statement pours a certain gloom on the present status of salmon management, we greatly appreciate the increased transparency within NASCO, and the full part that NGOs are able to play in the debate. We thank you, the Secretariat and our hosts for the excellent organisation for this meeting, and we look forward to open and robust debate, and to Parties agreeing to resolutions that they will actually implement when they return home. Wild Atlantic salmon conservation must be our primary objective, and we urge all Parties to embrace that basic principle.

List of Participants

* Denotes Head of Delegation

CANADA

* Mr Richard Nadeau <i>Richard.Nadeau@dfo-mpo.gc.ca</i>	<u>Representative</u> Fisheries and Oceans, Québec (QC)
Mr Serge Tremblay <i>serge.tremblay@mrnf.gouv.qc.ca</i>	<u>Representative</u> Ministère des Ressources Naturelles et de la Faune du Québec, Québec
Mr Brett Norton <i>Brett.Norton@dfo-mpo.gc.ca</i>	Fisheries and Oceans, Ottawa, Ontario
Ms Pamela Parker <i>p.parker@atlanticfishfarmers.com</i>	Atlantic Canada Fish Farmers Association, New Brunswick
Ms Susan Rocque <i>sue.rocque@dfo-mpo.gc.ca</i>	Fisheries and Oceans, Ottawa, Ontario
Mr Brian Skinner <i>Brian.Skinner@mrnf.gouv.qc.ca</i>	Ministère des Ressources Naturelles et de la Faune du Québec, Québec
Ms Rebecca Willcott <i>rebecca_willcott@nunatsiavut.com</i>	Nunatsiavut Government, Happy Valley - Goose Bay, Newfoundland

DENMARK (IN RESPECT OF THE FAROE ISLANDS AND GREENLAND)

Ms Ane Hansen <i>ahly@nanoq.gl</i>	Minister, Ministry of Fisheries, Hunting Agriculture, Nuuk
*Mr Emanuel Rosing <i>emanuel@nanoq.gl</i>	Ministry of Fisheries, Hunting & Agriculture, Nuuk
Ms Sonja Feldthaus <i>SOFE@nanoq.gl</i>	Agency of Fisheries, Hunting & Agriculture, Fisheries Unit, Nuuk, Greenland
Ms Kristina Guldbaek <i>krgu@nanoq.gl</i>	Ministry of Fisheries, Hunting & Agriculture, Nuuk

Ms Kathrine Odegard
kaod@nanoq.gl Ministry of Fisheries, Hunting & Agriculture, Nuuk

Ms Sofie Schultz Christiansen Interpreter

EUROPEAN UNION

*Mr Alan Gray
alan.gray@ec.europa.eu Representative
European Commission, DG Mare, Brussels, Belgium

Mr Marco D'Ambrosio
marco.dambrosio@ec.europa.eu Representative
European Commission, Brussels, Belgium

Dr John Armstrong
j.armstrong@marlab.ac.uk Scottish Government, Marine Scotland, Pitlochry,
Scotland, UK

Ms Carmen Beraldi
cberaldi@mapa.es Secretaria General del Mar, Madrid, Spain

Ms Elizabeth Black
liz.black@environment-agency.gov.uk Environment Agency, Penrith, Cumbria, England,
UK

Dr Ciaran Byrne
ciaran.byrne@fisheriesireland.ie Inland Fisheries Ireland, Swords, Dublin, Ireland

Mr Hakan Carlstrand
hakan.carlstrand@fiskeriverket.se Swedish Board of Fisheries, Gothenburg, Sweden

Dr Jaakko Erkinaro
jaakko.erkinaro@rktl.fi Finnish Game and Fisheries Research Institute, Oulu,
Finland

Mr Clemens Fieseler
clemens.fieseler@ble.de Federal Ministry for Agriculture and Food (BLE),
Bonn, Germany

Ms Barbara Franceschinis
barbara.franceschinis@defra.gsi.go DEFRA, Marine Freshwater Biodiversity,
London, England, UK

Dr Cathal Gallagher
cathal.gallagher@cfb.ie Central Fisheries Board, Swords, Dublin, Ireland

Dr Paddy Gargan
paddy.gargan@fisheriesireland.ie Central Fisheries Board, Swords, Dublin, Ireland

Mr Tapio Hakaste
Tapio.hakaste@mmm.fi Ministry of Agriculture and Forestry, Helsinki,
Finland

Ms Eija Kirjavainen
eija.kirjavainen@mmm.fi Ministry of Agriculture and Forestry, Helsinki,
Finland

Mr Pentti Pasanen <i>pentti.pasanen@ely-keskus.fi</i>	Employment and Economic Development Centre for Lapland, Rovaniemi, Finland
Mr Ted Potter <i>ted.potter@cefas.co.uk</i>	Centre for Environment, Fisheries and Aquaculture Science, Lowestoft, England, UK
Professor Phil Thomas <i>phil.thomas@artilus.co.uk</i>	Scottish Salmon Producers Organisation, UK
Ms Benedicte Valadou <i>benedicte.valadou@onema.fr</i>	ONEMA, Direction Générale, Vincennes, France
Dr Jonathan White <i>JonathanW@marine.ie</i>	Marine Institute, Galway, Ireland
Mr Manson Wright <i>manson.wright@scotland.gsi.gov.uk</i>	Scottish Government, Marine Scotland, Edinburgh, Scotland, UK

NORWAY

* Mr Arne Eggereide <i>arne.eggereide@dirnat.no</i>	<u>Representative</u> Directorate for Nature Management, Trondheim
Mr Raoul Bierach <i>raoul.bierach@dirnat.no</i>	<u>Representative</u> Directorate for Nature Management, Trondheim
Dr Peder Fiske <i>Peder.Fiske@nina.no</i>	Norwegian Institute for Nature Research, Trondheim
Ms Heidi Hansen <i>heidi.hansen@dirnat.no</i>	Directorate for Nature Management, Trondheim
Dr Jens Christian Holm <i>jens-christian.holm@fiskeridir.no</i>	Directorate of Fisheries, Bergen
Mr Christopher Grovdal Ronbeck <i>christopher.grovdal-ronbeck@fk.dep.no</i>	Ministry of Fisheries and Coastal Affairs, Oslo
Dr Lise Torkildsen <i>Lise.Torkildsen@mattilsynet.no</i>	Norwegian Food Safety Authority, Brumunddal

RUSSIAN FEDERATION

* Dr Boris Prischepa
persey@pinro.ru

Dr Svetlana Krylova
krylova@pinro.ru
Mr Dmitry S Lipatov
karelrybvod@mail.ru

Mr Viacheslav A Movchan
karelrybvod@mail.ru

Dr Sergey Prusov
prusov@pinro.ru

Ms Elena Samoylova
elena@pinro.ru

Mr Dmitry V Shakhmatov
karelrybvod@mail.ru

Representative

Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk

Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk
Karelrybvod, Petrozavodsk

Karelrybvod, Petrozavodsk

Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk

Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk

Karelrybvod, Petrozavodsk

USA

* Ms Patricia A Kurkul
Pat.Kurkul@noaa.gov

Mr George Lapointe
georgelapointe@gmail.com

Ms Kimberly Blankenbeker
Kimberly.Blankenbeker@noaa.gov

Ms Mary Colligan
mary.a.colligan@noaa.gov

Ms Nicole Ricci
RicciNM@state.gov

Mr Rory Saunders
rory.saunders@noaa.gov

Mr Tim Sheehan
Tim.Sheehan@noaa.gov

Representative

NOAA Fisheries, Gloucester, USA

Representative

Hallowell, Maine

National Marine Fisheries Service, Silver Spring, Maryland

President of NASCO

National Marine Fisheries Service, Gloucester, Massachusetts

US Department of State, Washington

National Marine Fisheries Service, Orono, Maine

National Marine Fisheries Service, Woods Hole, Massachusetts, USA

STATES NOT PARTIES TO THE CONVENTION

France (in respect of St Pierre and Miquelon)

Mr Nicolas Fairise
Nicolas.fairise@agriculture.gouv.fr Ministry of Agriculture, Food Fisheries, Rural Affairs
and Territories, Paris

INTER-GOVERNMENTAL ORGANIZATIONS

Mr Gérald Chaput
Gerald.Chaput@dfo-mpo.gc.ca Chairman, ICES Working Group on North Atlantic
Salmon

Dr Cathal Gallagher
cathal.gallagher@cfb.ie European Inland Fisheries and Aquaculture Advisory
Commission

NON-GOVERNMENT ORGANIZATION – SPECIAL INVITE

KNAPK (Organization of Fishermen & Hunters in Greenland)

Mr Leif Fontaine
Mr Alfred ER Jakobsen
knapk@knapk.gl

NON-GOVERNMENT ORGANIZATIONS

Acting Chairman of NASCO's Accredited NGOs / Salmon and Trout Association, UK

Mr Paul Knight
paul@salmon-trout.org

Association Internationale de Défense du Saumon Atlantique, France

Mr Philippe Méry
philippemery@yahoo.fr

Atlantic Salmon Federation Canada

Mr David Meerburg
Ms Sue Scott
dmeerburg@asf.ca
sscott@asf.ca

Atlantic Salmon Trust, UK

Mr Anthony Andrews
Professor Ken Whelan
(Chairman of the International Atlantic Salmon Research Board)
director@atlanticsalmontrust.org
ken.whelan@hotmail.com

Coalition Clean Baltic, Sweden

Mr Gunnar Norén
gunnar.noren@ccb.se

Federation of Irish Salmon and Sea-Trout Anglers, Ireland

Mr Noel Carr
dgl1@indigo.ie

Irish Seal Sanctuary, Ireland

Mr Patrick Peril
peril5@eircom.net

Norskelakseelver (Norwegian Salmon Rivers), Norway
Mr Torfinn Evensen *Torfinn@lakseelver.no*

Norwegian Association of Hunters and Anglers, Norway
Mr Oyvind Fjeldseth *o.f@njff.org*

ISFA/NASCO LIAISON GROUP REPRESENTATION

Mr Sebastian Belle <i>futureseas@aol.com</i>	Chairman of NASCO/ISFA Liaison Group Maine Aquaculture Association, Maine, USA
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<u>SECRETARIAT</u>	<i>hq@nasco.int</i>
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Dr Malcolm Windsor	Secretary
Dr Peter Hutchinson	Assistant Secretary
Ms Mairi Ferguson	PA to the Secretary
Ms Louise Forero	PA

CNL(11)38

Twenty-Eighth Annual Meeting of the Council

Hotel Arctic, Ilulissat, Greenland

4 - 6 June, 2011

Agenda

- 1. Opening Session**
- 2. Adoption of Agenda**
- 3. Financial and Administrative Issues**
 - 3.1 Report of the Finance and Administration Committee
- 4. Scientific, Technical, Legal and Other Information**
 - 4.1 Secretary's Report
 - 4.2 Report on the Activities of the Organization in 2010
 - 4.3 Announcement of the Tag Return Incentive Scheme Grand Prize
 - 4.4 Scientific Advice from ICES
 - 4.5 Scientific Research Fishing in the Convention Area
 - 4.6 Report of the International Atlantic Salmon Research Board
CNL(11)9
 - 4.7 Report of the Standing Scientific Committee
CNL(11)10

5. Next Steps for NASCO

5.1 Special Session: Progress with the Next Steps Strategy

- (a) Final Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group
- (b) Report of 'Next Steps for NASCO' Review Group
- (c) Progress in implementing a Public Relations Strategy

5.2 Decisions by the Council in the light of the 'Next Steps for NASCO' Special Session

5.3 Arrangements for the External Performance Review

6. Conservation, Restoration, Enhancement and Rational Management of Atlantic Salmon under the Precautionary Approach

6.1 Annual Reports on Implementation Plans

6.2 Liaison with the North Atlantic Salmon Farming Industry

6.3 New or Emerging Opportunities for, or Threats to, Salmon Conservation and Management

6.4 Incorporating Social and Economic Factors in Salmon Management

6.5 St Pierre and Miquelon Salmon Fishery

6.6 Reports on the Work of the Three Regional Commissions

7. Other Business

8. Date and Place of Next Meeting

9. Report of the Meeting

10. Press Release

CNL(11)39***North Atlantic Salmon Conservation Organization
2012 Budget and 2013 Forecast Budget***

Section	Description	Expenditure	
		Budget 2012	Forecast 2013
1	Staff-related costs	345,570	280,880
2	Travel and subsistence	28,000	143,000
3	Research and advice	61,180	63,000
4	Contribution to Working Capital Fund	0	0
5	Meetings	34,000	8,000
6	Office supplies, printing and translation	24,000	25,000
7	Communications	14,000	14,000
8	Headquarters Property	37,600	38,500
9	Office furniture and equipment	6,500	6,500
10	Audit and other expenses	59,500	10,100
11	Tag Return Incentive Scheme	4,700	4,700
12	International Atlantic Salmon Research Fund	0	0
13	Contribution to Contractual Obligation Fund	250,000	83,500
	Total	865,050	677,180

Section	Description	Income	
		Budget 2012	Forecast 2013
14	Contributions - Contracting Parties	587,000	616,180
15	General Fund - Interest	1,000	4,000
16	Income from Headquarters Property	57,000	57,000
17	Surplus or Deficit (-) from 2010	0	0
18	Transfer from Working Capital Fund	150,000	0
19	Transfer from Contractual Obligation Fund	45,050	0
20	Transfer from IASRB Fund	25,000	0
	Total	865,050	677,180

**Adjustments to 2011 contributions (Pounds Sterling)
to take into account confirmed 2009 Catch Statistics**

Party	2009 Provisional catch	2009 Confirmed catch	2011 Contribution based on provisional catch	2011 Contribution based on confirmed catch	Adjustment to 2012 contribution
Canada	119	126	70,589	72,365	+1,776
Denmark (Faroe Islands and Greenland)	26	26	37,707	37,562	-144
European Union	318	329	140,951	143,015	+2,064
Norway	595	595	238,892	235,591	-3,301
Russian Federation	71	71	53,618	53,224	-394
USA	0	0	28,514	28,514	0
TOTAL	1,129	1,147	570,270	570,270	0

Note: A positive adjustment represents an underpayment in 2011.

**NASCO Budget Contributions for 2012 and Forecast
Budget Contributions for 2013 (Pounds Sterling)**

Party	2010 Provisional catch (tonnes)	Contribution for 2012	Adjustment from 2011	Adjusted contribution for 2012	Forecast contribution for 2013
Canada	146	71,420	+1,776	73,196	74,939
Denmark (Faroe Islands and Greenland)	40	40,876	-144	40,732	42,899
European Union	510	176,306	+2,064	178,370	185,264
Norway	642	214,341	-3,301	211,040	224,860
Russian Federation	88	54,707	-394	54,313	57,408
USA	0	29,350	0	29,350	30,809
TOTAL	1,426	587,000	0	587,000	616,180

Contributions are based on the official returns by the Parties. Column totals can be in error by a few pounds due to rounding.

Council

CNL(11)8

Report of the ICES Advisory Committee
(Section 10.1 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.

10 NORTH ATLANTIC SALMON STOCKS

10.1 Introduction

10.1.1 Main tasks

At its 2010 Statutory Meeting, ICES resolved (C. Res. 2010/2/ACOM09) that the **Working Group on North Atlantic Salmon** [WGNAS] (chaired by Gérald Chaput, Canada) will meet at ICES HQ, 22–31 March 2011 to consider questions posed to ICES by the North Atlantic Salmon Conservation Organization (NASCO). In March 2011, NASCO also asked ICES to provide a more detailed evaluation of the choice of appropriate management units to be used in a risk-based framework for the provision of catch advice for the Faroese salmon fishery, taking into account relevant biological and management considerations and including, if possible, worked examples of catch advice.

The sections of the report which provide the responses to the terms of reference are identified below.

a) With respect to Atlantic Salmon in the North Atlantic area:	Section 10.1
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 2010; ¹	10.1.5
2. Report on significant new or emerging threats to, or opportunities for, salmon conservation and management; ²	10.1.6
3. Report on significant advances in our understanding of associations between changes in biological characteristics of all life stages of Atlantic salmon and ecosystem changes with a view to better understanding the dynamics of salmon populations; ³	10.1.7
4. Further develop approaches to forecast pre-fishery abundance for North American and European stocks with measures of uncertainty;	10.1.8
5. Provide a review of examples of successes and failures in wild salmon restoration and rehabilitation and develop a classification of activities which could be recommended under various conditions or threats to the persistence of populations; ⁴	10.1.9
6. Provide a compilation of tag releases by country in 2010 and advise on the utility of maintaining this compilation;	10.1.10
7. Identify relevant data deficiencies, monitoring needs and research requirements. ⁴	10.1.13
b) With respect to Atlantic salmon in the North-East Atlantic Commission (NEAC) area:	10.2
1) Describe the key events of the 2010 fisheries; ⁵	

2) Review and report on the development of age-specific stock conservation limits;	
3) Describe the status of the stocks and provide annual catch options or alternative management advice for 2012–2014, 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. On 9 March 2011 a supplementary request was received from NASCO: “Provide a more detailed evaluation of the choice of appropriate management units to be used in a risk based framework for the provision of catch advice for the Faroese salmon fishery, taking into account relevant biological and management considerations and including, if possible, worked examples of catch advice.”^{6,7}	10.1.12
4) Further investigate opportunities to develop a framework of indicators or alternative methods that could be used to identify any significant change in previously provided multi-annual management advice.	10.1.11
c) With respect to Atlantic salmon in the North American Commission (NAC) area:	10.3
1) Describe the key events of the 2010 fisheries (including the fishery at St Pierre and Miquelon); ⁵	
2) Update age-specific stock conservation limits based on new information as available;	
3) Describe the status of the stocks; ⁷	
<i>In the event NASCO informs ICES that the framework of indicators (FWI) indicates that reassessment is required⁸:</i>	
4) Provide annual catch options or alternative management advice for 2011–2014 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. ⁶	
d) With respect to Atlantic salmon in the West Greenland Commission (WGC) area:	10.4
1) Describe the key events of the 2010 fisheries; ⁵	
2) Describe the status of the stocks;	
<i>In the event NASCO informs ICES that the framework of indicators (FWI) indicates that reassessment is required⁸:</i>	
3) Provide annual catch options or alternative management advice for 2011–2013 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. ⁶	

Notes:

1. With regard to question a.1, 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 a.2, ICES is requested to include information on any new research into the migration and distribution of salmon at sea and on the potential impacts of the development of alternative/renewable energy on Atlantic salmon.
 3. With regard to question a.3, there is particular interest in determining if declines in salmon abundance 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 whether these declines can be related to environmental changes, including climate change.
 4. With regard to question a.5, ICES is requested to include information on best solutions for fish passage and associated mitigation efforts with examples of practices in member countries.
 5. In the responses to questions b.1, c.1, and d.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.
 6. In response to questions b.3, c.4, and d.3, provide a detailed explanation and critical examination of any changes to the models used to provide catch advice.
 7. In response to question d.2, 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 b.3 and c.3.
 8. The aim should be for NASCO to inform ICES by 31 January of the outcome of utilizing the FWI.
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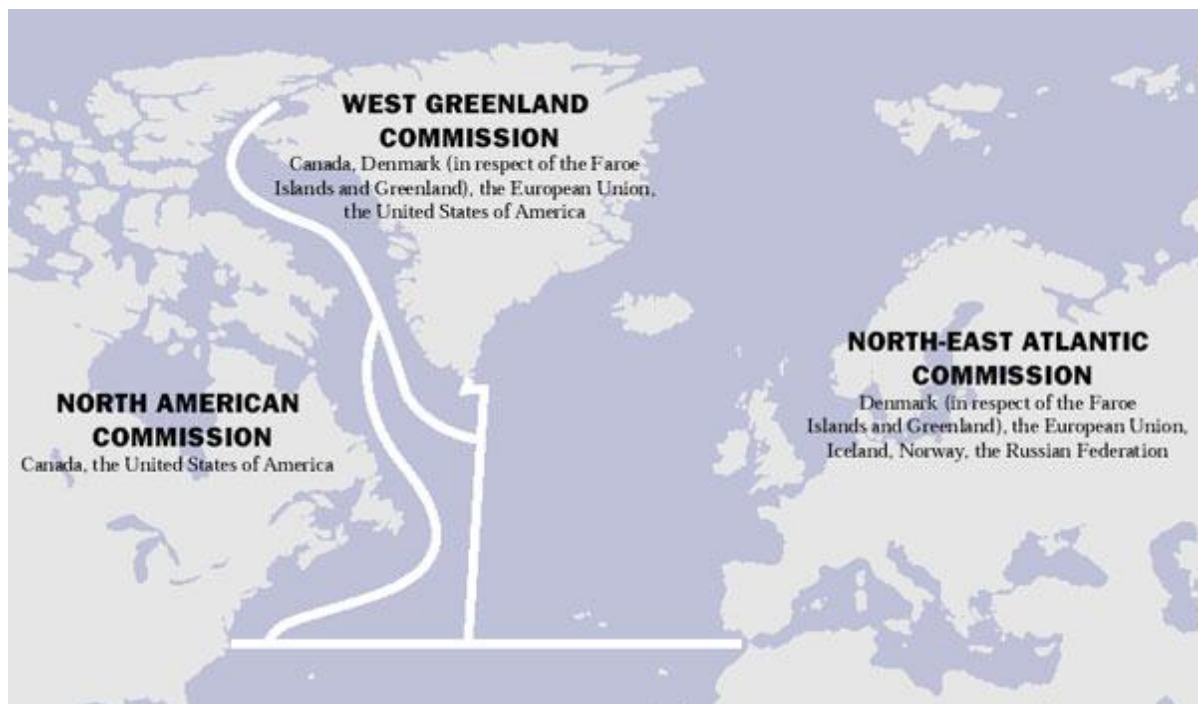
At the 2009 Annual Meeting of NASCO, conditional multi-annual regulatory measures were agreed to in the West Greenland Commission (2009–2011) and for the Faroe Islands (2009–2011) in the Northeast Atlantic Commission. The measures were conditional on a Framework of Indicators (FWI) being provided by ICES, and the acceptance of the FWI by the various parties of each commission. At the 2009 annual meeting of NASCO, Denmark (in respect of the Faroe Islands) opted out of the multi-annual regulatory measures as a FWI was not provided by ICES for the fishery in the Faroes (ICES, 2010a). In January 2011, NASCO indicated that no change to the management advice previously provided by ICES was required for the fishery at West Greenland.

In response to the remaining terms of reference, the Working Group considered 33 Working Documents. A complete list of acronyms is provided in Annex 10.1. References cited are given in Annex 10.2.

10.1.2 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 Organization (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. Although sovereign states retain their role in the regulation of salmon fisheries for salmon originating in their own rivers, distant-water salmon fisheries, such as those at Greenland and Faroes, which take salmon originating in 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 three Commission areas shown below:



10.1.3 Management objectives

NASCO has identified the organization's primary management objective:

“To contribute through consultation and cooperation 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 an interpretation of how this is to be achieved:

- "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".

10.1.4 Reference points and application of precaution

Atlantic salmon has characteristics of short-lived fish stocks; mature abundance is sensitive to annual recruitment because there are only a few age groups in the adult spawning stock. Incoming recruitment is often the main component of the fishable stock. For such fish stocks, the ICES maximum sustainable yield (MSY) approach is aimed at achieving a target escapement (MSY $B_{\text{escapement}}$, the amount of biomass left to spawn). No catch should be allowed unless this escapement can be achieved. The escapement level should be set so there is a low risk of future recruitment being impaired, similar to the basis for estimating B_{pa} in the precautionary approach. In short-lived stocks, where most of the annual surplus production is from recruitment (not growth), MSY $B_{\text{escapement}}$ and B_{pa} might be expected to be similar and B_{pa} is considered a reasonable initial estimate of MSY $B_{\text{escapement}}$.

To be consistent with the MSY and the precautionary approach, ICES considers that fisheries should only take place on maturing one-sea-winter (1SW) salmon and non-maturing 1SW salmon from rivers where stocks have been shown to be at full reproductive capacity. Furthermore, due to the different status of individual stocks within the stock complex, mixed-stock fisheries present particular threats to stock status.

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 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 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.

Therefore, stocks are regarded by ICES as being at full reproductive capacity only if they are above the $MSY B_{\text{escapement}}$ (or CLs).

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.

10.1.5 Catches of North Atlantic salmon

10.1.5.1 Nominal catches of salmon

Nominal catches of salmon reported for countries in the North Atlantic for 1960–2010 are given in Table 10.1.5.1. Catch statistics in the North Atlantic include fish farm escapees and in some northeast Atlantic countries also include ranched fish.

Icelandic catches have traditionally 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 ranching for rod fisheries in two Icelandic rivers continued into 2010 (Table 10.1.5.1). 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 2001–2010 are provided below.

AREA	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NEAC	2876	2495	2304	1978	1998	1867	1407	1532	1158	1400
NAC	150	150	144	164	142	140	114	162	129	149
WGC	43	9	9	15	15	22	25	26	26	40
Total	3069	2654	2457	2157	2155	2029	1546	1720	1313	1589

The provisional total nominal catch for 2010 was 1589 tonnes, 276 t above the updated catch for 2009 (1313 t). The 2010 catch was 164 t below the average of the last five years (1753 t), and over 600 t below the average of the last 10 years (2201 t) (Figure 10.1.5.1).

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 2010 nominal catch (in tonnes) was partitioned accordingly and is shown below for the NEAC and NAC Commission Areas. Figure 10.1.5.2 presents these data on a country-by-country basis. There is considerable variability in the distribution of the catch among individual countries. In most countries the majority of the catch is now taken in freshwater; the coastal catch has declined markedly.

AREA	COAST		ESTUARY		RIVER		TOTAL
	Weight	%	Weight	%	Weight	%	Weight
NEAC	419	30	87	6	894	64	1400
NAC	10	6	40	27	100	67	149

Coastal, estuarine, and riverine catch data aggregated by region are presented in Figure 10.1.5.3. In northern Europe, about half the catch has typically 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. There has been a reduction in the proportion of the catch taken in coastal waters over the last five years. In southern Europe, catches in all fishery areas have declined dramatically over the period. While coastal fisheries have historically made up the largest component of the catch, these fisheries have declined the most, reflecting widespread measures to reduce exploitation in a number of countries. In the last four years, the majority of the catch in this area has been taken in freshwater.

In North America, the total catch over the period 2000–2010 has been relatively constant. The majority of the catch in this area has been taken in riverine fisheries; the catch in coastal fisheries has been relatively small in any year (13 t or less), but has increased as a proportion of the total catch over the period.

10.1.5.2 Catch and release

The practice of catch and release (C&R) 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 Canada and USA, C&R 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.

The nominal catches presented in Section 10.1.5.1 do not include salmon that have been caught and released. Table 10.1.5.2 presents C&R information from 1991 to 2010 for countries that have records; C&R may also be practiced in other countries while not being formally recorded. There are large differences in the percentage of the total rod catch that is released: in 2010 this ranged from 12% in Norway (this is a minimum figure) to 70% in UK (Scotland) reflecting varying management practices and angler attitudes among these countries. Catch and release rates have typically been highest in Russia (average of 84% in the 5 years 2004 to 2008) and are believed to have remained at this level. However, there were no obligations to report C&R fish in Russia in 2009 and records for 2010 are incomplete. Within countries, the percentage of fish released has tended to increase over time. There is also evidence from some countries that larger multi-sea-winter (MSW) fish are released in higher proportions than smaller fish. Overall, over 222 000 salmon were reported to have been released around the North Atlantic in 2010, the highest in the time-series.

10.1.5.3 Unreported catches

The total unreported catch in NASCO areas in 2010 was estimated to be 382 t; however, there was no estimate for Russia and the estimate for Canada is incomplete. The unreported catch in the NEAC area in 2010 was estimated at 357 t, and that for the WGC and NAC areas at 10 t and 15 t, respectively. The 2010 unreported catch by country is provided in Table 10.1.5.3. It has not been possible to separate the unreported catch into that taken in coastal, estuarine, and riverine areas. Over recent years efforts have been made to reduce the level of unreported catch

in a number of countries (e.g. through improved reporting procedures and the introduction of carcass tagging and logbook schemes).

AREA	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NEAC	1089	946	719	575	605	604	465	433	317	357
NAC	81	83	118	101	85	56	-	-	16	15
WGC	10	10	10	10	10	10	10	10	10	10

10.1.5.4 Farming and sea ranching of Atlantic salmon

The provisional estimate of farmed Atlantic salmon production in the North Atlantic area for 2010 is 1174 kt, the second year in which production in this area has been in excess of one million tonnes. The 2010 total represents a 5% increase on 2009 and a 26% increase on the previous 5-year mean. Norway and UK (Scotland) continue to produce the majority of the farmed salmon in the North Atlantic (78% and 13%, respectively). Farmed salmon production in 2010 was below the previous five-year average in Canada, Ireland, and Iceland.

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 2009 estimates for some countries in deriving a world-wide estimate for 2010. Noting this caveat, total production in 2010 is provisionally estimated at around 1369 kt (Figure 10.1.5.4), a 4% decrease on 2009, continuing the small decrease in production first noted in 2009 and reflecting a fall in production outside the North Atlantic in 2010. Production in this area is estimated to have accounted for 14% of the total in 2010 (down from 22% in 2009 and 34% in 2008). Production outside the North Atlantic is still dominated by Chile despite a further decrease in farmed salmon production in this country compared with 2009 (60%) due to an outbreak of infectious salmon anaemia (ISA) virus. The ISA outbreak is reported to have had a catastrophic impact on the Chilean salmon industry, where a further reduction in production is expected. There has been a recent sharp rise in farmed salmon prices as a result of these production problems.

The world-wide production of farmed Atlantic salmon in 2010 was over 850 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 2010 was 39 t, the majority of which (36 t) was taken by the Icelandic ranched rod fisheries (Figure 10.1.5.5). Small catches of ranched fish from experimental projects were also recorded in Ireland.

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

10.1.6.1 Update on Workshop on Age Determination of Salmon (WKADS)

ICES noted that a Workshop on Age Determination of Salmon (WKADS) had recently taken place in Galway, Ireland (January 2011) with the objectives of reviewing, assessing, documenting, and making recommendations on current methods of ageing Atlantic salmon. The Workshop had primarily focused on digital scale reading to measure age and growth, with a view to standardization.

On the basis of the draft Workshop output, ICES recommended that:

- 1) Further work be undertaken to address the issues raised at the Workshop regarding protocols, inter-laboratory calibration and quality control as they relate to the interpretation of age and calculation of growth and other features from scales;
- 2) A second Workshop should be convened to facilitate the work and reporting.

10.1.6.2 Overview of the potential impacts of the development of alternative/renewable energy on Atlantic salmon

Globally, there has been increasing interest in the development of renewable energy sources over recent years. Renewable (naturally replenished) energy is that which comes from sources such as sunlight, wind, water, geothermal heat, and biofuels. The growth of clean renewable energy has been seen as an important part of addressing climate change concerns. Together with high oil prices and an increasing awareness of the need for energy security, these concerns have led to increased levels of government support, renewable energy legislation, incentives, and commercialization. Thus, governments have been keen to support the development of renewable energy technologies and to see the establishment of new renewable energy schemes. Where such technologies rely on water power (river flow, tidal currents) or are located in aquatic environments, they have the potential to affect Atlantic salmon and other fish species.

The development of renewable energy is expected to assist in the effort to reduce carbon emissions worldwide. However, this development raises particular concerns given that the impacts of past hydroelectric power developments on the natural environment and biodiversity have frequently not been adequately addressed or mitigated. Further, many new developments have not been properly evaluated, in part because many of the devices have yet to be deployed and tested (Boehlert and Gill, 2010).

ICES recognised that the potential impacts of in-river and estuarine structures on Atlantic salmon are relatively well known given the long history of hydropower development and barrage construction in rivers supporting salmonid and other migratory species. However, reports from several countries indicated a marked increase in the number of hydropower schemes in recent years, and this was anticipated to increase further in coming years in response to government targets on renewable energy and the introduction of financial incentives to support this growth.

ICES noted apparent contradictions between the objectives of different EU Directives: Renewable Energy Directive (2009/28) seeks to promote the development of hydroelectric schemes, while the Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (1992/43) and the Water Framework Directive (2000/60) seek to protect the functionality and resiliency of rivers and require habitats to achieve good ecological status. ICES further noted that some countries, for example UK (England and Wales), are taking action to define standards (e.g. good practice guides) that must be adopted by developers at each proposed hydropower scheme to ensure appropriate environmental protection. Nonetheless, ICES considered that the difficulties posed by current salmon restoration programmes highlighted the importance of establishing robust standards at the outset and not relying on inadequate mitigation/compensation provisions.

ICES also acknowledged the recent marked increase in offshore wind farms. Wind turbines are particularly effective in areas where winds are stronger and more constant and, since offshore areas experience mean wind speeds far in excess of that on land, there is particular interest in establishing wind farms in coastal areas. Wind farms and other offshore renewable energy developments can impact on the environment during construction, operation, and

decommissioning (Gill, 2005). Commonly, construction and decommissioning are likely to cause some physical disturbance (e.g. noise and sediment load) with potential implications for local biological communities. However, once operational, underwater noise and the emission of electromagnetic fields from such developments may represent longer term and more serious threats for coastal and migratory species. The likelihood of any such impacts on Atlantic salmon will depend on interactions between the migratory routes of salmon, the behaviour of the fish in the proximity of the development, the location and distribution of proposed offshore developments, and the technologies deployed.

In recognition of the potential impact of wind and tidal offshore developments on migratory species, scientists in UK (Scotland) have recently reviewed the available information on the migratory routes and behaviour of Atlantic salmon (and other diadromous species) in Scotland's coastal environment (Malcolm *et al.*, 2010). The Scottish Government has set targets to generate 80% of national power capacity from renewable sources by 2020. However, it is recognised that the development of marine renewables will need to incorporate processes to assess, manage, and minimize environmental impacts through appropriate planning and licensing processes for such schemes. This study identified broadscale migration patterns for adult salmon, but recognised these were unlikely to be sufficient to inform site-specific risk assessments. The report concluded that significant knowledge gaps remain and that these should be considered as part of an overall assessment of research needs in relation to offshore renewable developments and diadromous fish.

ICES concluded that great care must be taken to minimize the impact of renewable energy schemes on salmon (and other species) through careful development, device design, and site selection. ICES highlighted that the pressures to expand renewable energy raised additional concerns, particularly given unresolved difficulties in establishing and maintaining appropriate safeguards for aquatic biodiversity in previous hydropower developments, and the risks posed by individual and cumulative developments within a catchment.

10.1.6.3 Overview of best solutions for fish passage with examples of practices in member countries

NASCO asked ICES to provide information on best solutions for fish passage and associated mitigation efforts with examples of practices in member countries.

ICES noted that river connectivity was vital in maintaining biodiversity and that maximizing the production of juvenile salmon in freshwater was particularly important at a time when the levels of salmon survival at sea were low. It is thus essential that all potential nursery habitat can be reached by salmon, and that smolts can freely reach the sea. Restricted fish passage can have significant ecological impacts. For example, salmon may be excluded from important nursery habitats, increasing levels of predation (by fish, birds, and anglers), or disease/parasite incidence, can occur where salmon aggregate at obstacles and move through impoundments, and smolts and kelts can be injured or killed on spillways, sills, or in turbines, as they migrate downstream. ICES recognised that in the face of increasing pressures on freshwater ecosystems, for example as a result of the growing threat from small-scale hydropower plants as identified in the previous section, effective fish passage solutions were essential.

ICES noted that there are several national and international manuals and comprehensive guides on both upstream (e.g. Evans and Johnston, 1980; Powers *et al.*, 1985; Struthers, 1993; Clay, 1995; Larinier, 2002; FAO/DVWK, 2002; Kroes *et al.*, 2006; Jungwirth *et al.*, 1998; NMFS, 2008; Degerman, 2008; Grande, 2010; Environment Agency, 2010) and downstream fish passage (e.g. Poe *et al.*, 1993; Washington Department of Fish and Wildlife, 2000; Larinier and Travade, 2002; Deutsche Vereinigung für Wasserwirtschaft, 2005; NMFS, 2008).

Fish passage consists of both upstream and downstream passage. Upstream passage can be achieved in a number of different ways. Removal of the obstacle (often dams) is the best solution. Opening of a dam or sluice gates can be used in some situations, but this is rarely applicable and a simple fish pass may be still required if water velocity or the head of water is too high for fish to swim upstream. Other options are to construct fishways; these can be 'natural' or 'technical'. 'Natural' fish passes include rocky ramps or the creation of channels either within or outside the watercourse. Technical fishways come in many types; these include: (a) pool and weir fishways (traditional fish ladders); (b) vertical slot fishways; and (c) Denil and Larinier fishways (roughened channels). Other, less frequently used options include: fish elevators, fish locks, fish pumps, and the trapping and transport of ascending spawners.

The technology available for upstream fish passage is more advanced than that available for downstream passage. There are particular concerns with downstream passage in relation to hydropower generation (Section 10.1.6.2). The key requirement to achieving effective downstream passage past obstructions is to lead the fish to a spillway or by-pass. Fish tend to go with the flow, which can present a particular problem when most of the water is led through turbines. Ensuring suitable bypass flows and adequate attraction flows (relative to generating flow) are considered critical variables regulating the effectiveness of downstream fish passage (Rivinoja, 2005).

Examples of practices in member countries

River Rhine, Germany

The stocks of Atlantic salmon in the River Rhine were lost at the end of the 1950s, and a reintroduction programme started in 1978 with the aim of re-establishing self-sustaining runs. One of the main obstacles that needs to be addressed is the upstream and downstream passage of fish. There are particular concerns about the movement of fish into and through the Rhine delta, with the Haringvliet Sluice in the Netherlands considered a major obstacle. However, free passage of fish is also a problem in most of the Rhine tributaries, both with regard to fish reaching their spawning grounds and in relation to losses of smolts at hydropower plants.

River Ätran, Sweden

The River Ätran is the most important salmon river on the Swedish west coast. In 1903 a power plant was established close to the mouth and salmon and sea trout had great difficulties passing this and a previous fish ladder. In 1946, the dam was equipped with a Denil fishway and this immediately improved upstream access for salmon. The salmon population in the River Ätran is currently assessed as of good status; 3000–5000 Atlantic salmon and sea trout have been counted passing the power plant annually over the period 2000 to 2010. However, upstream migration remains a problem for weaker swimmers such as eel and sea lamprey and further changes to the dam are proposed. Further downstream passage of fish in the river has been an ongoing problem.

River Monnow, UK (England and Wales)

In 2009, a fish pass was installed on Osbaston Weir on the River Monnow, one of the largest tributaries of the River Wye in Wales. The rock ramp by-pass channel opened up 200 km on the river to a wide range of species, and salmon have since been seen spawning upstream of the weir, with juvenile salmon found in subsequent fishery surveys.

River Taff, UK (England and Wales)

The River Taff is a recovering river in south Wales. Three fish passes have recently been installed (2003, 2005, and 2009) on the river to help with the re-establishment of salmon. Prior

to the installation of the passes, there were no salmon upstream. However, there has been progressive recolonization of the newly accessible areas since this time, with over 70% of the sites surveyed for juvenile salmon containing salmon fry in 2010.

River Himleån, Sweden

The River Himleån is a small catchment in Sweden. In the 1980s, salmon were absent from the river due to migration barriers, acidification in the upper parts, eutrophication in the lower parts, and canalization for drainage of agricultural areas. Today, 38 km of the river is accessible to salmon after removal of three dams and other habitat improvement measures. There has been a steady improvement in the densities of salmon parr in the river and the stock is currently assessed as being above conservation limits, i.e. from a lost salmon population to a healthy river in 23 years.

Summary

ICES noted that there was extensive information available on fish pass design and that improving fish passage had contributed to sustaining and recovering wild salmon populations. In addition, the technology available for upstream fish passage is often more advanced than that available for downstream passage. However, scientific evaluation was often absent or inadequate. It was recognised that fishways are never 100% effective, so a proportion of the migrating population is typically lost at each such structure. In rivers with multiple passes/barriers this can have substantial negative cumulative effects resulting in few spawners reaching the nursery areas and/or few smolts reaching the sea.

ICES recognised that careful design, adequate water supply, and proper maintenance were crucial to well functioning fishways. Where this was possible, the removal of dams had provided some positive examples of restoration, and complete removal of obstructions offered the best solutions for upstream and downstream movements of aquatic species without delays or mortality. However, there were many more examples of poorly designed and inefficient technical fishways where problems persisted and insufficient studies on the effectiveness of such structures.

10.1.6.4 Recent results from acoustic tracking investigations in Canada

ICES reviewed the results from the Atlantic Salmon Federation (ASF) who continued to assess estuarine and coastal survival of tagged Atlantic salmon released in rivers of the Gulf of St. Lawrence.

Assumed survivals for smolt in 2010 from freshwater release points to the head of tide, and from the head of tide to estuary exits, were similar for each of the rivers to those that have been observed in previous years. By contrast, there was an improvement in marine survivals across the Gulf of St. Lawrence to the Strait of Belle Isle. This was especially true of the Cascapedia River, where very few of the fish that successfully exited from Chaleur Bay into the Gulf of St. Lawrence failed to be detected in the Strait of Belle Isle.

10.1.6.5 Assessing the impact of common assessment procedures on smolt physiology, behaviour, and adult return rates

Marine survival estimates for various Atlantic salmon stocks are reported annually to ICES as part of the Working Group's assessment activities. It has previously been noted, however, that the assessment methodologies used in deriving these estimates may have a negative effect on fish behaviour and survival (Hansen, 1988; Hansen and Jonsson, 1988; Moffett *et al.*, 1997; Crozier and Kennedy, 2002; Riley *et al.*, 2007). Indeed, Crozier and Kennedy (2002) reported

that over a 13-year period wild salmon smolts tagged with Coded Wire Tags (CWT) on the River Bush, Northern Ireland had return rates 56.4% lower than untagged fish.

ICES noted recent investigations conducted in UK (England and Wales) to assess the impact of trapping, handling, anaesthesia, and tagging (CWT) of Atlantic salmon on smolt physiology, smolt migratory behaviour, and subsequent adult return rates.

Physiology of wild migrating smolts - River Frome

Cortisol levels determined from blood plasma of actively migrating smolts caught on the River Frome indicated a highly significant ($p < 0.01$) increase in plasma cortisol concentrations following capture, consistent with an acute ('fight or flight') stress response.

Physiology of hatchery-reared smolts - laboratory study

Hatchery-reared smolts were randomly assigned to one of five experimental treatments ($n=6$ per treatment): control; handled/ no anaesthetic; anaesthetised/ handled; anaesthetised/ adipose fin clip only; anaesthetised/ adipose fin clip and CWT. Cortisol release rates remained at around $4 \text{ ng g}^{-1} \text{ h}^{-1}$ in the control fish throughout the experiment. However, all fish subjected to a handling or tagging procedure responded with an acute stress response with an increase in cortisol release rates for 3 to 12 hours after the procedure. After this time period, cortisol release rates rapidly returned to baseline levels indicating that there was no chronic stress response in any of the groups.

Wild smolt migratory behaviour - River Ceiriog

Each September, in the years 2004 to 2006, wild salmon parr were captured, PIT (Passive Integrated Transponder) tagged and released back into the River Ceiriog, a tributary of the Welsh Dee in North Wales, at their site of capture. A proportion of these tagged salmon were subsequently monitored as they migrated downstream using a PIT tag detection system installed in the water intake of a trout farm. In April and early May 2006 to 2007, a proportion of the PIT-tagged smolts migrating downstream were intercepted using a rotary screw trap (RST), 1.1 km upstream from the water intake. All PIT-tagged smolts caught were anaesthetised and tagged with a CWT, before being returned to the river immediately downstream of the RST. The previously PIT-tagged smolts that migrated past the RST without being caught and that were subsequently detected at the water intake were used as the control group.

In both 2006 and 2007, the downstream migration timing of the control group of smolts was significantly correlated with the time of sunset. However, the downstream migration timing of the smolts intercepted and tagged with CWTs was statistically random with respect to sunset (Riley *et al.*, 2007).

Adult return rates - River Frome

Each September, in the years 2005 to 2008, around 10 000 wild salmon parr have been captured, PIT tagged, and released back into the River Frome in Dorset, at their site of capture. During the following springs (2006–2009), PIT-tagged salmon smolts have been intercepted using a RST in the lower reaches of the Frome. All PIT-tagged smolts caught were anaesthetised, tagged with a CWT and returned to the river. PIT-tagged smolts that successfully migrated past the RST during the spring without being caught, but that were detected using PIT antenna systems deployed in the lower Frome, were used as the control group. Differences in the survival between the CWT tagged fish and the control population were determined based on the adult return detection rate of the two groups recorded by a cross-river PIT antenna array (Ibbotson *et al.*, 2004) located 4.1 km upstream of the tidal influence.

Adult return rates have varied year on year. In two years, there has been no difference between the return rates of the control and tagged groups, while in the other two years, the return rate of the tagged group has been lower. Until November 2010 there was a 34.5% reduction ($p < 0.05$) in returns from RST intercepted/ CWT smolts compared with the control group. However, the results are strongly influenced by the returns of one smolt cohort (2007) and data are required from more years. The smolt run in 2007 was atypical, with >72% of the smolts caught and released during the daylight, possibly making them more vulnerable to visual predators, although environmental variation and run timing are also likely to play a key role in smolt survival. The River Frome study is planned to continue until 2014 and based on current adult salmon return rates it is anticipated that this will enable a more robust assessment of the effects of handling/tagging on adult return rates.

Summary

Ongoing concerns about trends in the marine mortality of salmon, together with reliance on marine survival data as inputs for stock assessment and modelling, emphasize the vital importance of obtaining accurate marine survival data. The results of this and earlier studies suggest that the additional mortality associated with the handling and tagging of wild smolts should be taken into account when assessing marine survival. However, further work is needed to assess the extent to which such handling and tagging effects might vary year on year in response to factors such as environmental effects and smolt run timing.

10.1.6.6 Red vent syndrome

Over recent years, there have been reports from a number of countries in the NEAC and NAC areas of salmon returning to rivers with swollen and/or bleeding vents. The condition, known as red vent syndrome (RVS), has been noted since 2005, and has been linked to the presence of a nematode worm, *Anisakis simplex* (Beck *et al.*, 2008). A number of regions within the NEAC stock complex observed a notable increase in the incidence of salmon with RVS during 2007 (ICES, 2008), but levels have been lower in some NEAC countries since 2008 (ICES, 2009; ICES, 2010a). However, levels of RVS on monitored rivers in UK (England and Wales) and in France have typically remained high (20–60%) and have changed relatively little over recent years. A survey conducted in Ireland also showed a high incidence of the condition in returning fish. Within the NAC stock complex, RVS has previously been detected in the Scotia-Fundy (2008 and 2009) and Quebec regions, but is currently thought to be at low levels.

There is no clear indication that RVS affects either the survival of the fish or their spawning success. Affected fish have been taken for use as broodstock in a number of countries, successfully stripped of their eggs, and these have developed normally in hatcheries. Recent results have also demonstrated that affected vents showed signs of progressive healing in freshwater, suggesting that the time when a fish is examined for RVS, relative to its period of in-river residence, is likely to influence perceptions about the prevalence of the condition.

10.1.6.7 Reduced sensitivity and development of resistance towards treatment in the salmon louse (*Lepeophtheirus salmonis*)

ICES previously highlighted concerns arising from Norway regarding the development of reduced sensitivity of the salmon louse (*Lepeophtheirus salmonis*) to oral treatment (ICES, 2009, 2010a). The monthly reports of lice numbers on aquaculture salmon, as reported by fish farmers, show that the average number of adult lice on salmon in January and February 2011, for Norway as a whole, was at the same high level as seen in the previous year (www.lusedata.no). Throughout 2010, levels were on average higher than the previous year in the periods January to March and August to November. This, together with the increase in

geographic spread of incidences of treatment failure and resistance, gives ongoing cause for concern.

10.1.6.8 Atlantic salmon genetics - new initiatives in relation to management of mixed-stock coastal fisheries in northern Norway

SALSEA–Merge, and other current and previous projects, have contributed to the establishment of a comprehensive genetic baseline for salmon populations in northern Europe. Work continues to develop this baseline for the salmon populations of northernmost Europe into a practical and useful tool for the management of mixed-stock coastal fisheries in Norway and Russia. Power analysis of the genetic baseline indicated that with the present coverage, and number of genetic markers used, around 50% of the samples from coastal fisheries can be reliably assigned to river (probability >90%). However, it was recognized that the spatial coverage of the baseline should be expanded, and additional sampling should be conducted in a number of rivers to improve the precision of the assignment of individuals.

A further initiative to facilitate management of these mixed-stock fisheries has been taken by Norway, Russia, and Finland. Under this project, a model for coastal migration of returning spawners to these northern salmon rivers will be developed. Up to 100 northern rivers will be added to the genetic baseline, and up to 18 000 samples from coastal fisheries in Norway and Russia will be analysed. It is anticipated that the activities in this project will provide a foundation on which a river-specific management regime for coastal and riverine fisheries for these northern populations can be implemented.

10.1.6.9 SALSEA West Greenland

SALSEA West Greenland is designed to enhance the current Baseline Sampling Program (Section 10.4) and integrate with the coordinated marine surveys in other oceanic areas to provide data for investigating hypotheses on the causal mechanisms driving stock-specific performance in the ocean (i.e. marine survival).

In 2010, the SALSEA West Greenland Enhanced Sampling Program resulted in detailed examination of 358 fresh whole salmon, which were purchased directly from individual fishers. Fresh whole fish are needed, as the protocols for many of the samples require the collection of fresh internal tissues. The following provides the samples collected in 2010 and their purpose:

- adipose tissue samples preserved in RNALater for origin determination;
- scale samples for age and growth studies;
- stomach samples preserved in formalin for diet studies;
- sea lice collections preserved in both RNALater and EtOH for Slice® resistance and population genetics studies;
- muscle fillet sections frozen for lipid analysis;
- otolith and water samples for oxygen isotope analysis;
- heart and kidney samples preserved in both RNALater and formalin for parasite (*Ichthyophonus*) investigations;
- pyloric caeca, gill arch, liver, spleen, kidney, and heart samples preserved in formalin for miscellaneous parasite investigations;
- intestines preserved in formalin for parasite analysis;
- kidney samples preserved in RNALater and frozen for ISAv analysis;
- adipose and caudal fin clip, dorsal muscle and liver frozen samples and scale samples for stable isotopes analysis;
- gill rakers, pyloric caeca, spleen, and kidney frozen samples for miscellaneous disease investigations.

ICES recommends that SALSEA West Greenland be conducted in 2011 and that efforts continue to integrate the results from this sampling program with results obtained from both SALSEA–Merge and SALSEA North America.

10.1.6.10 Salmon bycatch in the Icelandic mackerel fishery

In 2010, the Icelandic Directorate of Fisheries launched a programme to investigate the incidence of salmon bycatch in a new mackerel fishery, which started in late May of that year. The programme was limited to 1000–3000 tonne multi-gear vessels fishing with a mid-water trawl. The monitoring of these landings for salmon bycatch was primarily carried out in land-based sorting facilities prior to processing and freezing of the mackerel catch. The sampling rate was 40 kg per 100 t of landed catch. However, a few salmon were also recovered in factory trawlers. The total bycatch recorded during the 2010 fishing season was 170 salmon, most of which were less than 60 cm in fork length and thus in their first sea-year. Four of the salmon were tagged, three with CWTs and one with a Carlin tag. Three of the tags originated in Norway and one from Ireland. Most of the bycatch occurred in areas off eastern and northeastern Iceland during the early summer months.

ICES welcomed this opportunistic assessment of the incidence of salmon bycatch in this pelagic fishery and also the opportunity to collect samples from the salmon caught.

10.1.6.11 Reintroduction of salmon – developments on the River Rhine

The programme of reintroducing Atlantic salmon to the River Rhine started 20 years ago and the first adult salmon was recorded in the River Sieg, a tributary of the Rhine, in 1990, more than 30 years after the extirpation of salmon from the Rhine catchment. Naturally produced juvenile salmon were first observed in 1994 and since the start of the programme more than 6200 adult salmon have now been recorded in the Rhine and its tributaries. Stocking of juveniles is planned to continue.

After a successful pilot project in 2006, the downstream migration of Atlantic salmon smolts has been monitored in the River Rhine each year since 2007. The study aims to investigate the success of downstream migration through Germany and the Netherlands and to assess the migration routes in relation to the obstructions within the partly dammed Rhine Delta, particularly the Haringvliet sluices. The number of fish reaching the sea after passage through the delta has typically been relatively low; the highest proportion (when 46% of the smolts were recorded reaching the sea) occurred in 2007 and may reflect higher discharge in this year. In 2010, in common with previous years, the most important migration route from all rivers to the sea was the passage through the Haringvliet sluices in the Netherlands.

ICES noted that proposed changes to the way in which the Haringvliet sluices will be operated had potential implications for the success of the programme. Previously, the Dutch government had agreed to the implementation of progressive measures to partially open the sluices. However, following a change in the government in 2010 these measures were dropped and alternative ecologically meaningful alternatives are to be examined. This has raised serious concerns among the different organizations involved in the migratory fish programmes on the River Rhine, since this will affect the main migration route for these fish.

10.1.7 NASCO has asked ICES to report on significant advances in our understanding of associations between changes in biological characteristics of all life stages of Atlantic salmon and ecosystem changes with a view to better understanding the dynamics of salmon populations

ICES had previously considered a preliminary report from the second meeting of the Study Group on the Identification of Biological Characteristics for Use as Predictors of Salmon Abundance [SGBICEPS] (ICES, 2010a) and noted that the final Study Group report had since been published (ICES, 2010b). No other new information was presented to ICES.

10.1.8 NASCO has asked ICES to further develop approaches to forecast pre-fishery abundance for North American and European stocks with measures of uncertainty

The Study Group on Salmon Stock Assessment and Forecasting (SGSAFE) was set up to further develop Atlantic salmon stock assessment and forecast models and to assist ICES in providing catch advice to NASCO for management of the North Atlantic high seas salmon fisheries. There were originally four terms of reference for the Study Group:

- a) Update and further develop stock and/or catch forecast models for salmon stocks in the NAC and NEAC areas;
- b) Evaluate options for developing forecast models which include all sea-age classes;
- c) Evaluate methods for incorporating uncertainty in the assessments;
- d) Develop risk analyses for the provision of salmon catch advice.

At the first meeting of the Study Group in March 2009, new forecast models for the NAC and NEAC areas were developed. For NAC, the input data used in the run-reconstruction were updated, and some of the regional spawner and return inputs were revised. A regional disaggregated model for the single 1SW non-maturing component was developed using a first order random walk production parameter. The inference portion of the model included uncertainties in the lagged spawner values (as priors) and in the 2SW returns to regions as pseudo-observations. Uncertainties in catches and biological characteristics of the West Greenland fishery were included in the forecast and the full risk analysis for West Greenland was provided. The inference and forecast portions of the model were run in a Bayesian hierarchical framework. Details of the work completed during the first Study Group are provided in ICES (2010a).

For the NEAC area, efforts were made to translate the run reconstruction of returns and spawners from Excel Crystal Ball© to R© to facilitate the development of the assessment and forecast model in a Bayesian hierarchical framework. Models for the southern NEAC and northern NEAC stock complexes, which combined maturing and non-maturing 1SW return streams from common lagged eggs, were developed. The forecast portion of the model was developed for the stock complex level and included a risk assessment of the probability of meeting or exceeding stock complex conservation limits in the absence of any fisheries. The models for NEAC were presented in 2009 and were accepted and used in 2009 and 2010 for the provision of catch advice (ICES, 2010a). Details of the NEAC model were presented in ICES (2009). The work of the Study Group was incomplete in 2009 and the group agreed to continue working on the model development in subsequent years.

Further to the work conducted by ICES in 2009, the ACOM Review Group of the Working Group report was critical of some aspects of the models and added an additional term of reference for consideration by the Study Group:

- e) Explore the possibility of incorporating physical and biological variables into the models that may explain variation in salmon survival.

The second meeting of the Study Group was held in March 2011 in Moncton (NB), Canada. As in the first Study Group, experts in Bayesian modelling and Atlantic salmon assessments from France, who were not national delegates from their country to ICES, participated. The following progress was made.

10.1.8.1 Update and further develop stock and/or catch forecast models for salmon stocks in the NASCO North American and North East Atlantic Commission areas

The model for NAC originally developed during the first Study Group meeting was refined to account for covariance in the productivity parameters among the regions. Pre-Fishery Abundance (PFA) of 1SW non-maturing salmon is modelled for each region proportionally to lagged spawners using a first order autocorrelated function. The inter-regional variance in the productivity parameter was modelled as a multinormal distribution which ascribes correlation in productivity between regions among years. The justification for using the inter-region covariance matrix for the productivity parameter is that the fish share a common marine environment during part of their life cycle, but there can be regional specificities in the evolution of the freshwater and/or the marine coastal environment and subsequent variation in productivities.

Unresolved issues with the NEAC model developed in 2009 were resolved at the 2011 meeting. These included: the incorporation of the uncertainty in the regional returns for the Bayesian formulation which had not been completed during the previous meeting, an interest in exploring further alternate productivity functions such as the shifting level dynamic, consideration for the disaggregation of the returns and spawners at a sub-complex scale and the development of the full catch advice scenario.

The revised NEAC model developed by the Study Group is a combined sea-age group model with uncertainty in the returns and lagged eggs structured in a hierarchical Bayesian framework. The differences from the 2009 model structure include: a single productivity parameter is estimated for the lagged eggs to PFA association and the proportion maturing is uncoupled from the productivity parameter estimation. The productivity parameter remains a first order autocorrelated function and in addition the proportion maturing is also modelled as a first order autocorrelated function. The revised model is applied to develop catch advice for the Southern NEAC and Northern NEAC stock complexes.

10.1.8.2 Evaluate options for developing forecast models which include all sea-age classes

The combined sea-age class models have been developed for the NEAC stocks but not for the NAC stock. At present, the spawning stock variable for NEAC is lagged eggs from both sea-age groups and both maturing and non-maturing recruitments are modelled simultaneously with a common productivity parameter. For NAC, only 2SW spawners are used and ICES has only considered the recruitment of the non-maturing 1SW salmon, which is the sea-age group exploited at West Greenland. The maturing 1SW salmon are not exploited in that fishery.

Some points of discussion were raised regarding the assumptions on heritability of age-at-maturity in the two differing assumptions for NAC and NEAC. For the NEAC model, the assumption is that an egg is an egg regardless of its sea-age origin. However, there is an interest in conserving the sea-age structure of the spawning stock which is why the conservation limits are defined by sea-age group. A preliminary examination of this assumption could be done by comparing the variation in the proportion maturing parameter with the corresponding proportions of the lagged eggs contributed by one of the sea-age groups of the spawners. For the NAC model, the assumption is that there is perfect heritability in that 2SW salmon spawners are the only contributor to 1SW non-maturing salmon and that no other sea-age groups (including 3SW and repeat-spawning MSW salmon) produce recruitment of 1SW non-maturing salmon. The Study Group did not have time to consider a combined sea-age group model for NAC, but a model structure similar to that developed for NEAC could be considered.

10.1.8.3 Evaluate methods for incorporating uncertainty in the assessments

From the very first Study Group meeting, the development of inference and forecast models in a hierarchical Bayesian framework was considered the most appropriate approach to use. Both the NAC and NEAC models incorporate the uncertainty in the input data (or pseudo-observations) to the models. Further developments which would consider physical or biological variables to characterize the functional relationship between spawners and recruitment must also consider how to incorporate the uncertainty in those variables and in the forecasts.

10.1.8.4 Develop risk analyses for the provision of salmon catch advice

The development of the catch advice in a risk analysis framework within the Bayesian structure is complete for the NAC model. A similar approach for NEAC was proposed by ICES in 2010, further developed at the Study Group and is being completed by ICES (see Section 3.10 in ICES, 2010b).

10.1.8.5 Explore the possibility of incorporating physical and biological variables into the models that may explain variation in salmon survival

A very good scientific literature review of environmental and biological factors associated with biological characteristics and survival of Atlantic salmon is available in the SGBICEPS Study Group report (ICES, 2010b). The factors vary between NAC and NEAC and even within areas of NEAC. Progress on this term of reference would require the development of models at scales below the stock complex level. No specific work (exploration of forecast models and environmental variables) on this term of reference was done during the Study Group. The group began breaking out the spawning and recruitment dynamic into the specific salmon life stages associated with freshwater and marine environments.

10.1.8.6 Next steps

The Study Group report is to be finalized by July 2011. The models developed by the Study Group have been presented to ICES and are being used to develop catch advice for both NAC and NEAC. The Study Group tasks are considered complete and no further meetings are planned. Further work on the question of incorporating environmental variables in assessment and forecast models is expected by collaborators in a new EU-funded project – Effective Use of Ecosystem and Biological Knowledge in Fisheries (ECOKNOWS) – and one of their deliverables is reporting to ICES.

10.1.9 NASCO has asked ICES to provide a review of examples of successes and failures in wild salmon restoration and rehabilitation and develop

a classification of activities which could be recommended under various conditions or threats to the persistence of populations

ICES noted that a Study Group had been established to address this question. The Study Group on Effectiveness of Recovery Actions for Atlantic Salmon [SGERAAS] was set up and had intended to work by correspondence to make progress on this issue. The Study Group has not been able to address this question and there was no progress to report. ICES recognised that the issue of the restoration and rehabilitation of salmon stocks remained a concern, but that the issue could not be appropriately addressed by the Working Group during its annual meeting. ICES remains of the view that a Study Group is the best way to provide this review.

10.1.10 NASCO has asked ICES to provide a compilation of tag re-leases by country in 2010 and advise on the utility of maintaining this compilation

10.1.10.1 Compilation of tag releases and fin clip data by ICES member countries in 2010

Data on releases of tagged, fin-clipped, and otherwise marked salmon in 2010 were provided by ICES and are compiled as a separate report (ICES, 2011). A summary of tag releases is provided in Table 10.1.10.1.

10.1.10.2 Utility of maintaining the tag compilation

In addition to providing a compilation of tag releases by country in 2010, NASCO asked ICES for advice on the utility of maintaining this compilation. ICES felt there was still some value and usefulness of maintaining the tag compilation, in particular while such large numbers of salmon are being tagged annually and while the return of tags can add to the knowledge about salmon at sea. With the preparation and assistance from the ICES Secretariat the tag compilation can be carried out during the annual meeting of the Working Group. ICES therefore recommends continuing with the annual compilation of salmon tags and encourages further use of the scientific information gathered from tagging programmes.

10.1.11 NASCO has requested ICES to 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.

ICES (2007) adopted a FWI for the Greenland fishery based on the seven contributing regions/stock complexes with direct links to the three management objectives established by NASCO for that fishery. At the time, ICES was unable to develop a FWI for the Faroese fishery because none of the available indicator data sets met the criteria for inclusion in the FWI. In 2009, ICES (2009) updated the NEAC data sets previously examined in the FWI but these still did not satisfy the criteria for inclusion in the FWI as being informative of a significant change, since over the time-series the PFA estimates have predominately remained above the spawning escapement reserve (SER). As a result, a different set of decision rules for this FWI has been proposed. For the NEAC stocks, the status of stocks should be re-evaluated if the FWI suggests that the PFA estimates are deviating substantially from the median values from the forecast. Several criteria for when the PFA deviates substantially from the forecast were explored and the 95 % confidence interval range of the indicator prediction relative to the median forecast value was chosen to define the thresholds. The limits should be computed at the median values of the PFA forecasts in each of the years in a multi-year advice. In the event of a closed fishery, the indicators should be compared to the upper 95% confidence limit, and

in the event of an open fishery they should be compared to both the upper and lower 95 % confidence limits (Figure 10.1.11.1).

To be included in the FWIs an indicator must fulfil two criteria: it must be a reliable predictor of the relevant PFA (r^2 from the regression larger than 0.20), and the value of the indicator (or a preliminary value) must be available for the inclusion in the FWI evaluation by mid-January. Of the retained indicators eight were from Northern NEAC and 20 from Southern NEAC (Table 10.1.11.1). A spreadsheet for FWIs for each of the stock complexes was developed.

Based on the proposed FWI framework for NEAC, for a fishery to be opened or to remain open, there should be a high probability that all four stock complexes would meet their CLs, and any indication that there has been a change in PFA from the forecast median value would trigger an assessment. If very few indicators are available to run the FWI by the agreed time, this would automatically trigger an assessment for the coming year.

Until alternative management units are agreed the indicators should be regressed against the stock complexes to which they belong. For example MSW indicators from Norway should be regressed against PFA MSW for Northern NEAC. ICES recommends that this procedure should be developed further and presented for the next assessment in 2012.

10.1.12 NASCO has asked ICES to provide a more detailed evaluation of the choice of appropriate management units to be used in a risk-based framework for the provision of catch advice for the Faroese salmon fishery, taking into account relevant biological and management considerations and including, if possible, worked examples of catch advice

ICES has previously developed a risk framework for the provision of catch advice for the West Greenland fishery (WGF) which involves estimating the uncertainty in meeting defined management objectives at different levels of catch (catch options) (ICES, 2009). The procedure has been accepted by NASCO and employed by ICES in providing catch advice. In 2010, ICES (2010b) outlined a risk framework that could be used to provide and evaluate catch options for the Faroes fishery based on the method currently used to provide catch advice for the West Greenland fishery. ICES (2010b) described the procedure for conducting such an assessment and noted that the following three issues required decisions by managers before full catch advice could be provided:

- the choice of management units for NEAC stocks;
- the specification of management objectives;
- the share arrangement for the Faroes fishery.

The NEA Commission discussed the above questions at the 2010 NASCO annual meeting and during inter-sessional discussions but did not reach any conclusion. In this section, the proposed risk framework is explored in more detail, a number of issues including the choice of management units are discussed, and a worked example of catch advice is provided in Section 3.10.8.

10.1.12.1 Faroes fishing season

The Faroes fishery has historically operated between October/November and May/June, but the historical TACs applied to a calendar year. This means that two different cohorts of salmon of each age class (e.g. two cohorts of 1SW salmon, etc.) were exploited under each TAC. Uncertainty would be reduced if the data analysis and development of catch options was

provided by fishing season, October to June, rather than the calendar year. This approach has been assumed in the examples provided in this report.

10.1.12.2 Choice of management units

ICES (2010b) noted that basing an assessment of stock status on the large stock complex units presently used greatly increases the risks to individual river stocks. The choice of management units may be influenced by both biological and political considerations as well as by practical issues such as the availability of data. Management which requires meeting CLs for individual stocks would require basing the management of a mixed-stock fishery on the status of each individual river stock (or population) that it exploits, possibly split by sea-age group. Applying such an approach to the management of the Faroes fishery would result in >3000 management units in the NEAC area (i.e. at least two age groups in each of ~1500 rivers).

Larger management units might be defined on biological grounds, such as commonalities in migratory patterns of stocks or other biological characteristics, but insufficient data are available to determine such groupings at present. From a jurisdictional perspective, there is likely to be a strong preference for splitting the management units to at least the national level because of the different management regimes adopted by jurisdictions.

The development of catch advice is also constrained by the availability of data. The run–reconstruction (RR) model, which is used to estimate PFA and national CLs can, in theory, be run for individual rivers, but estimates of exploitation rates and unreported catches required for the model are not normally available at this level and there is no benefit in sub-dividing the assessment between areas for which the same parameter values would be used. The assessment of TAC options also requires data on the size and age composition and origin of the catch. Some data are available from historic sampling in the Faroes fishery when it operated in the 1980s to 1990s, but data on the origin of the catch are limited. While the overall pattern appears reasonable, the results are relatively imprecise and some gaps (which arise from lack of tags) appear inconsistent with our general understanding of the stocks. The approximate nature of these estimates is not critical in the RR analysis, particularly since there has been little or no catch at Faroes for more than a decade, but it has a much more significant impact on the evaluation of catch options going forward. More precise estimates of stock composition could be obtained using genetic stock identification techniques on either historical (e.g. scales) or future samples collected in the fishery.

There is a conflict between the desire to define the NEAC management units at the jurisdiction level or below and the restrictions of the data which probably limit the definition of management units between the levels of jurisdictions and the currently used stock complexes. These management units would also be split into age groups (1SW and MSW).

The main problem with allocating catch to management units relates to the difficulty of estimating the contribution of the management units for which there are limited tag recoveries (e.g. UK (Northern Ireland), France, Finland). A compromise that would partly resolve this problem could be to amalgamate geographically neighbouring units.

10.1.12.3 Management objectives

The management objectives provide the basis for determining the risks to stocks in each management unit associated with different catch options. However, NASCO has not provided management objectives for the Faroes fishery. The NASCO agreement on the adoption of a Precautionary Approach (NASCO, 1998) indicates that salmon fisheries should be managed by means of CLs and management targets and also calls for the ‘formulation of pre-agreed management actions in the form of procedures to be applied over a range of stock conditions’.

This suggests that the management objectives (e.g. the required probability of exceeding the CL) should be agreed in advance of specific management proposals being considered. Nevertheless, the proposed presentation of the catch options would permit managers to review the risk that different TAC options would pose to individual management units and choose a risk level that they consider appropriate.

ICES also considered the implications of basing the risk framework on overall abundance objectives for management units comprising large numbers of river stocks. Even setting management units at the jurisdiction level would mean that (at least) four management units (i.e. Ireland, Norway, Russia, and UK (Scotland)) would each comprise over one hundred river stocks. Thus it would still be possible for large numbers of river stocks to be below CL while the management unit as a whole was meeting its management objective. If the management unit is set at the stock complex level, the problem would be greater, and it would be possible, for example, for the status of river stocks in a jurisdiction with many salmon rivers to completely mask the status of the stocks in a jurisdiction with fewer rivers.

An additional management objective could be applied to all management units based on the status of individual stocks. For example, this objective might state that for each of the management units an agreed percentage of the assessed river stocks must meet specified management objectives before a TAC is allocated to the mixed-stock fishery at Faroes. The criteria for judging satisfactory compliance with these requirements would need to be agreed by managers.

10.1.12.4 Sharing agreement

The ‘sharing agreement’ will establish the proportion of any harvestable surplus within the NEAC area that could be made available to the Faroes fishery through the TAC. In effect this means that for any TAC option being evaluated for the Faroes, it is assumed that the total harvest would be the TAC divided by the Faroes share.

The management framework for the West Greenland fishery provides a precedent for setting a share allocation based on the historic split of declared catches at West Greenland and in North America using a baseline period of 1986–1990 (catches in West Greenland are lagged one year back). ICES (2010b) indicated that the same method could be used to establish the share arrangement for the Faroes fishery, and since some stocks are exploited at both Faroes and West Greenland, suggested that it might be appropriate to use the same baseline period. On this basis, the share allocations would be 7.5% to Faroes, 7.1% to West Greenland, and 85.4% to all NEAC homewater fisheries.

NASCO has not provided a share allocation, but one Party had proposed an alternative baseline period of 1984–1988. The share allocations based on this period would be 8.4% Faroes, 5.2% West Greenland, and 86.4% all NEAC homewater fisheries (Table 10.1.12.1). In the absence of an agreed share allocation, a value of 8% for the Faroes fishery has been used in this example.

10.1.12.5 Evaluation of catch options

The process for assessing each catch option within the risk framework would be as follows. Parameters marked with an ‘*’ in the equations have uncertainty around them and so contribute to the estimation of the probability density function around the potential total harvest arising from each TAC option.

The TAC option (T) is first divided by the mean weight (W) of salmon caught in the Faroes fishery to give the number of fish (N) that would be caught; thus:

$$N = T / W^*$$

This value is converted to numbers of wild fish (N_w) by multiplying by one minus the proportion of farm escapees in the Faroes catch (p_E) observed in historic sampling programmes:

$$N_w = N \times (1 - p_E^*)$$

This value is split into numbers by sea-age classes (1SW and MSW) according to the proportion of each age group (p_{Ai}) observed in historic catch sampling programmes at Faroes, and the discards that die (i.e. 80% of fish less than 60 cm TL) are added to the 1SW catch. Thus:

$$N_{w1SW} = N_{wtotal} \times p_{A1SW}^* + (N_{wtotal} \times p_D^* \times 0.8)$$

and

$$N_{wMSW} = N_{wtotal} \times p_{AMSW}^*$$

where ' p_D ' is the proportion of the total catch that is discarded (i.e. <60 cm TL).

Further corrections are made to the 1SW and MSW numbers to reduce the 1SW total to take account of the proportion that will not mature as grilse and to add the survivors from this group to the MSW fish in the following year. For the first catch advice year the number added to the MSW total is adjusted to the TAC applying in the current year (i.e. zero in 2011). Thus:

$$N_{w1SW} = N_{w1SW} \times p_M^*$$

and

$$N_{wMSW} = N_{wMSW} + N_{w1SW} \times (1 - p_M^*) \times e^{-12m}$$

where ' p_M ' is the proportion of 1SW salmon that are expected to mature in the same year (0.78) and ' m ' is the instantaneous monthly rate of mortality.

The numbers in each age group are then divided among the management units by multiplying by the appropriate proportions (p_{Uj}), where ' i ' denotes the age groups and ' j ' denotes the management units:

$$N_{wij} = N_{wi} \times p_{Uj}$$

Finally, each of these values is raised by the Faroes share allocation (S) to give the total potential harvest (H_{ij}) of fish from each management unit and sea-age group.

$$H_{ij} = N_{wij} / S$$

These harvests are then subtracted from the stock forecasts (PFA_{ij}) for the management units and sea-age groups and compared with the Spawner Escapement Reserves (SER) to evaluate attainment of the management objective. In practice the attainment of the management objective is assessed by determining the probability that

$$PFA_{ij} - H_{ij} - SER_{ij} > 0.$$

The SER is the number of fish that need to be alive at the time of the Faroes fishery to meet the CL when the fish return to homewaters; this equals the CL raised by the mortality over the intervening time. CLs and SERs are currently estimated without uncertainty.

10.1.12.6 Input data for the risk framework

NASCO has asked ICES to provide worked examples of catch advice. On the basis of the above evaluation, the following example of the risk framework is based on the stock complexes previously used for the provision of catch advice. The assessment requires input data as described in Section 10.1.12.5. Some of these parameters (e.g. mean ages and weights, discard

rates, etc.) apply to the catch that might occur at the Faroes if a TAC was allocated. In most cases the only data available to estimate these parameters come from sampling programmes conducted in commercial and research fisheries in Faroese waters in the 1980s and 1990s.

Mean weights: Mean weights of salmon caught in the commercial and research fisheries operating in Faroese waters between 1983/84 and 1995/96 varied between 3.06 and 5.23 kg (Table 10.1.12.2) (ICES, 1997). However, high values were observed at the beginning of the time-series when part of the catch was taken to the north of the Faroes EEZ, and the values for the latter part of the series are based on relatively small catches in a research fishery which may not be as representative of a full commercial fishery.

Proportion by sea age: The age composition of catches in the Faroes fishery has been estimated from samples collected in the 1983/84 to 1994/95 fishing seasons (Table 10.1.12.3) (ICES, 1996). The samples taken between 1991/92 and 1994/95 were from the research fishery and included potential discards but excluded farm escapees. As a result, values have been drawn from the observations between 1985/86 and 1990/91 to provide a probability distribution for this parameter. However, the age composition of the catches may be expected to be related to the mean weight (Figure 10.1.12.2). To take account of this relationship, the values of mean weight and age composition used in each sample run have been drawn from the same years.

Discard rates: In the past, there was a requirement to discard any fish less than 60 cm total length caught in the Faroes fishery and discard rates have been estimated from the proportions of fish less than 60 cm in catch samples between the 1982/83 and 1994/95 seasons (ICES, 1996); 80% of these fish were expected to die (ICES, 1986).

Proportions of fish farm escapees: The proportion of fish farm escapees in the catches at Faroes has also been estimated from samples taken in the 1980/81 to 1994/95 fishing season (ICES, 1996). However, there have been substantial changes in the production of farmed fish and in the incidence of escape events. Data were available on the proportion of farm escapees in Norwegian coastal waters between 1989 and 2008; the proportion in recent years (2002–2008) was 63% of the proportion during the period 1989/90 to 1994/95 when the sample time-series overlap. The proportion of farm escapees used in the risk framework has therefore been generated by multiplying the rates observed in the Faroes fishery between 1988/89 to 1994/95 by 0.63.

Proportions of catches by management unit: The origin of the stocks exploited at Faroes has been estimated from smolt and adult tagging studies and an approximate split between jurisdictions has been employed in the NEAC RR model (e.g. ICES, 2010a). These same proportions have been used to develop the risk framework, but because of the uncertainties described in Section 10.1.12.2, they have been grouped at the stock complex level. Thus 1SW salmon are assigned 50% to Northern NEAC and 50% to Southern NEAC area. MSW salmon are assigned 60.5% to Northern NEAC and 27.5% to Southern NEAC; the remaining 12% of MSW salmon were estimated to derive from other jurisdictions not currently included in the assessment (e.g. including Spanish and North American stocks).

Other input parameters include the Faroes sharing arrangement set at 0.08, the proportion 1SW non-maturing in the 1SW catch set at 0.22, mortality rate on discard fish set at 80%, and natural mortality in the second year at sea set at 0.03 per month.

10.1.12.7 Worked example of the risk framework

The methods and data described above have been used to provide an example of the risk framework for the Northern and Southern NEAC stock complexes using the PFA forecasts

derived from the Bayesian model. The results are presented as an example of how future catch advice might be provided, and do not constitute formal catch advice at this stage.

In the example, the probability of the stock complexes in Northern and Southern NEAC areas achieving their SERs (the overall abundance objective) for different catch options in the Faroes fishery (from 0 to 500 t) in 2012 to 2014 are shown in Table 10.1.12.4 and Figure 10.1.12.1. This assumes that the same TAC is applied and is taken in each of the three years. This indicates that there are no TAC options that will permit all stock complexes to have a greater than 75% probability of achieving their SERs in any year from 2012 to 2014. The flatness of the curves in the catch options figures is a characterization of the uncertainty in the estimates and the level of exploitation on the stocks in the Faroes fishery (Table 10.1.12.5 and Figure 10.1.12.2); more uncertain data and lower exploitation rates generate flatter curves.

Section 10.1.12.2 discusses the problem of basing this form of risk analysis on management units comprising large numbers of river stocks and proposes that an additional management objective should also be applied at a smaller geographical scale if the management units are defined at the jurisdiction or stock complex level. This objective might state that an agreed percentage of the assessed river stocks within each of the smaller geographic units must meet specified management objectives before a TAC is allocated to the mixed-stock fishery at Faroes. Table 10.1.12.6 provides examples of the type of data that might be used in such an assessment, noting that stock status indicators should be based on the attainment of CLs before exploitation.

ICES recommends that further work be undertaken to check the appropriateness of the various data inputs, including seeking original data sets from the sampling programmes in the Faroes, and to define the management objectives based on individual river stocks.

10.1.13 NASCO has requested ICES to identify relevant data deficiencies, monitoring needs, and research requirements

ICES recommends that the Working Group on North Atlantic Salmon (WGNAS) should meet in 2012 to address questions posed by ICES, including those posed by NASCO. The Working Group intends to convene at ICES headquarters from 20 to 29 March 2012.

List of recommendations

- ICES recommends that further work be undertaken to address the issues raised by the Workshop on Age Determination of Salmon regarding protocols, inter-laboratory calibration, and quality control as they relate to the interpretation of age and calculation of growth and other features from scales, and a second Workshop should be convened to facilitate this work and reporting (Section 10.1.6.1).
- ICES recommends a continuation of the annual compilation of salmon tag releases and encourages further use of the scientific information gathered from tagging programmes (Section 10.1.10).
- ICES recommends that further work be undertaken to check the appropriateness of the various data inputs used in the catch advice framework for the Faroes fishery, including seeking original data sets from the sampling programmes of the fishery in the historical time period (Section 10.1.12.7).
- A preliminary proposal for a Framework of Indicators for the NEAC stock complexes was developed in 2011. ICES recommends that until alternative management units are agreed by NASCO, this procedure be developed further and that new possible indicators be brought forward for the next assessment in 2012 (Section 10.1.11).
- ICES recommends that sampling of the Labrador food fisheries and at St. Pierre & Miquelon be continued and expanded if possible in 2011 and future years (Section 10.3).
- ICES supports the proposal from the Greenlandic authorities for the introduction of a logbook as a condition of the licensing system for the salmon fishery at West Greenland (Section 10.4).
- ICES recommends a continuation and expansion of the broad geographic sampling programme (multiple NAFO divisions) to more accurately estimate continent of origin and biological characteristics of the salmon in the West Greenland mixed-stock fishery (Section 10.4).
- ICES recommends that SALSEA West Greenland be conducted in 2011 for a third year and that efforts continue to integrate the results from this sampling programme with results obtained from both SALSEA–Merge and SALSEA North America (Section 10.1.6.9).
- In support of the management objective from NASCO to ensure that individual river stocks meet their conservation limits, ICES recommends that additional monitoring data or analyses of existing monitoring data (catches, juvenile surveys, short-term count data), be considered to augment the river-specific data used to develop the stock status and to improve management advice in both NAC and NEAC areas (Sections 10.2 and 10.3).

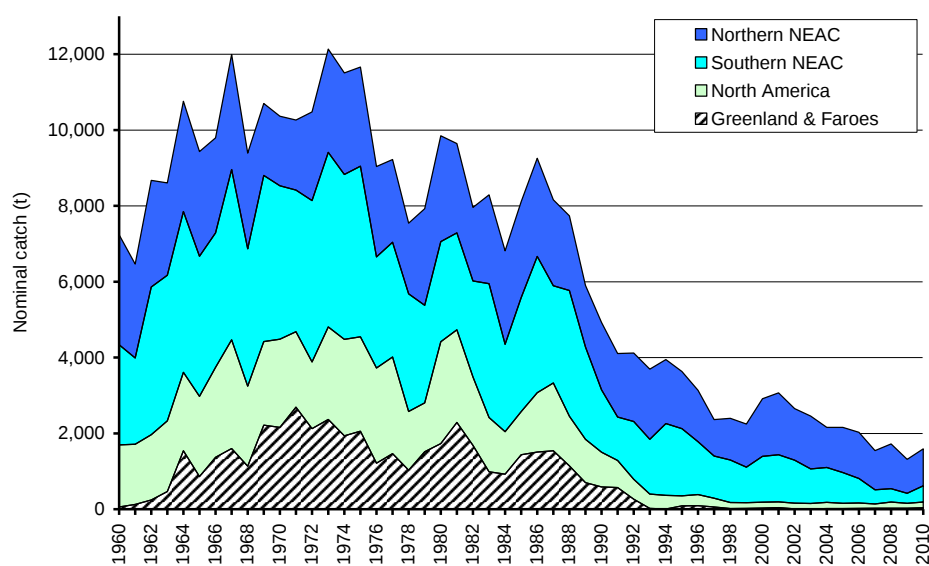


Figure 10.1.5.1. Reported total nominal catch of salmon (tonnes round fresh weight) in four North Atlantic regions, 1960 to 2010.

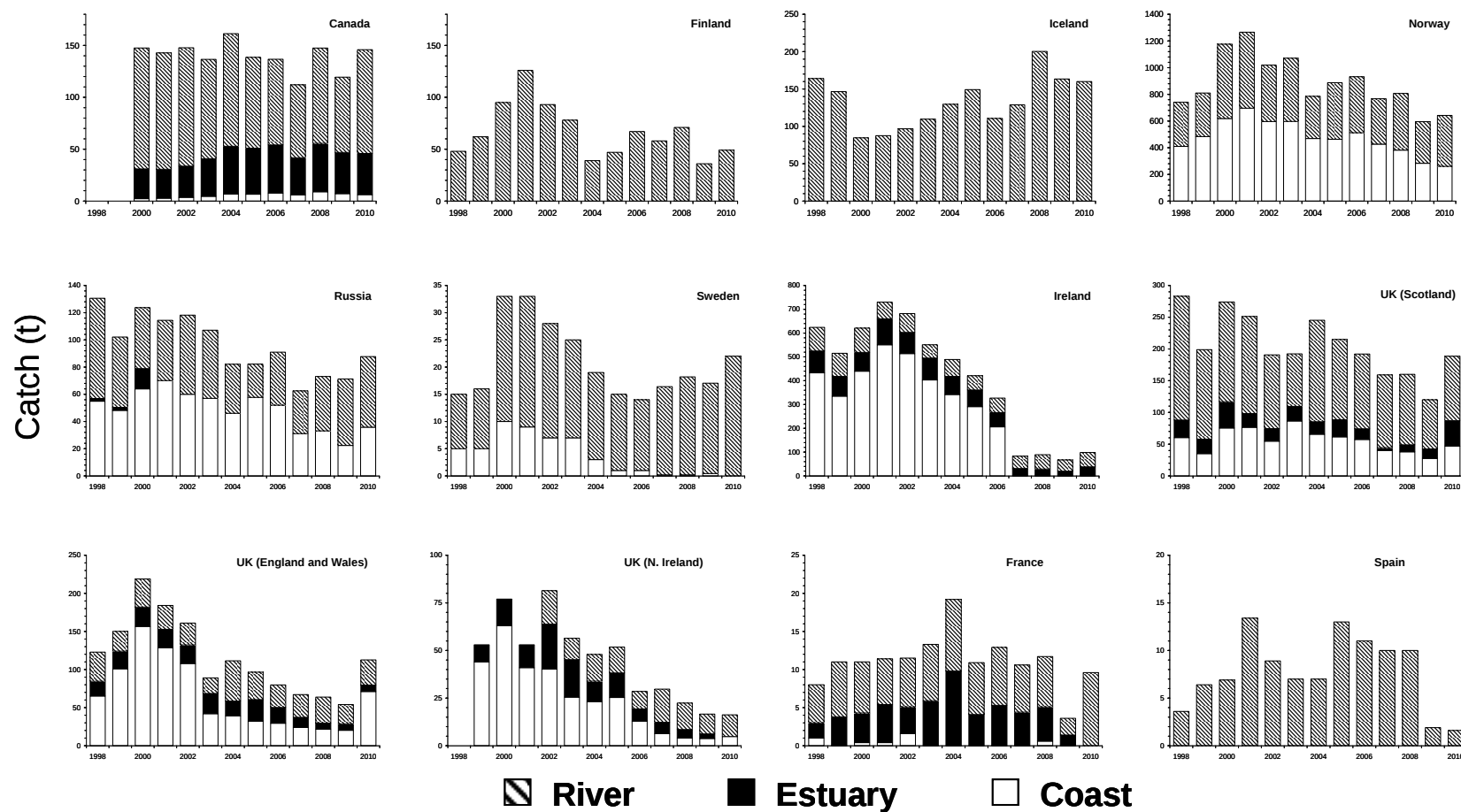


Figure 10.1.5.2. Nominal catch (t) by country taken in coastal, estuarine, and riverine fisheries.

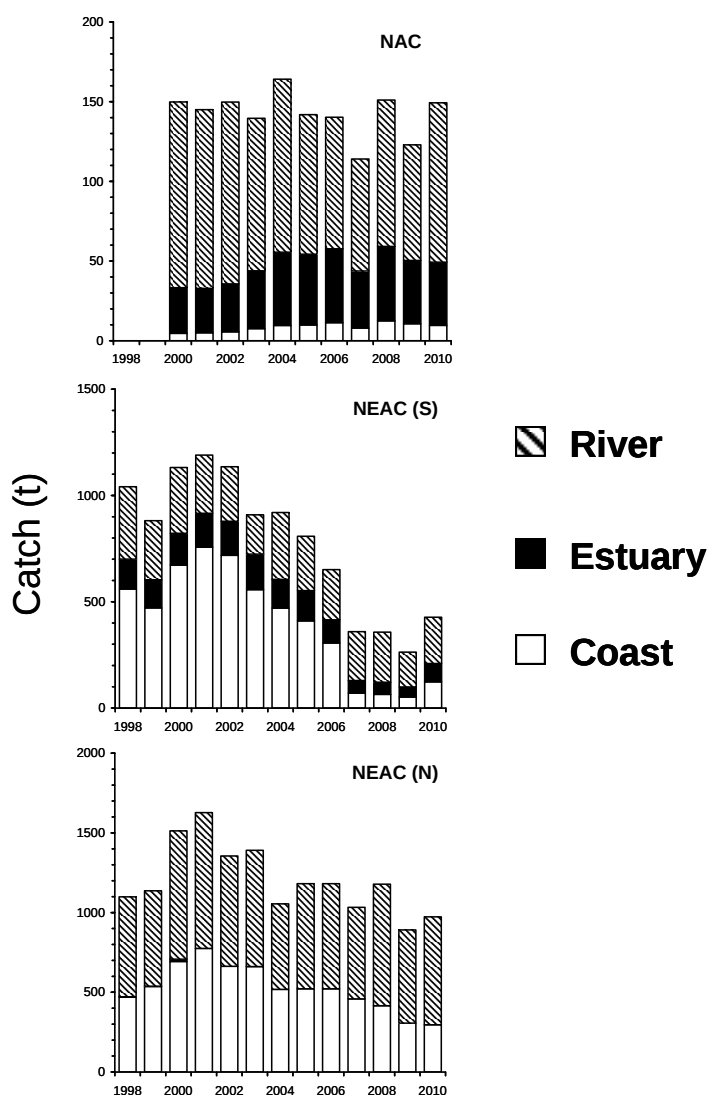


Figure 10.1.5.3. Nominal catch (t) taken in coastal, estuarine, and riverine fisheries for the NAC area, and for the northern and southern NEAC areas. Note that y-axes scales vary.

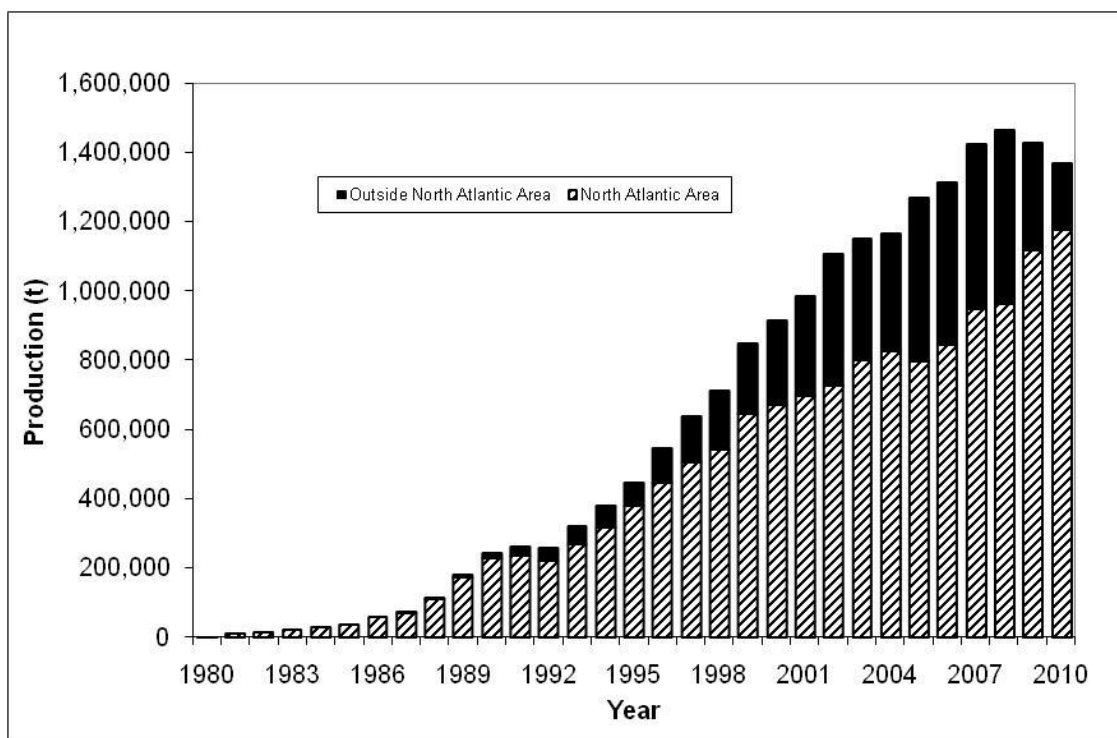


Figure 10.15.4. World-wide production of farmed Atlantic salmon, 1980 to 2010.

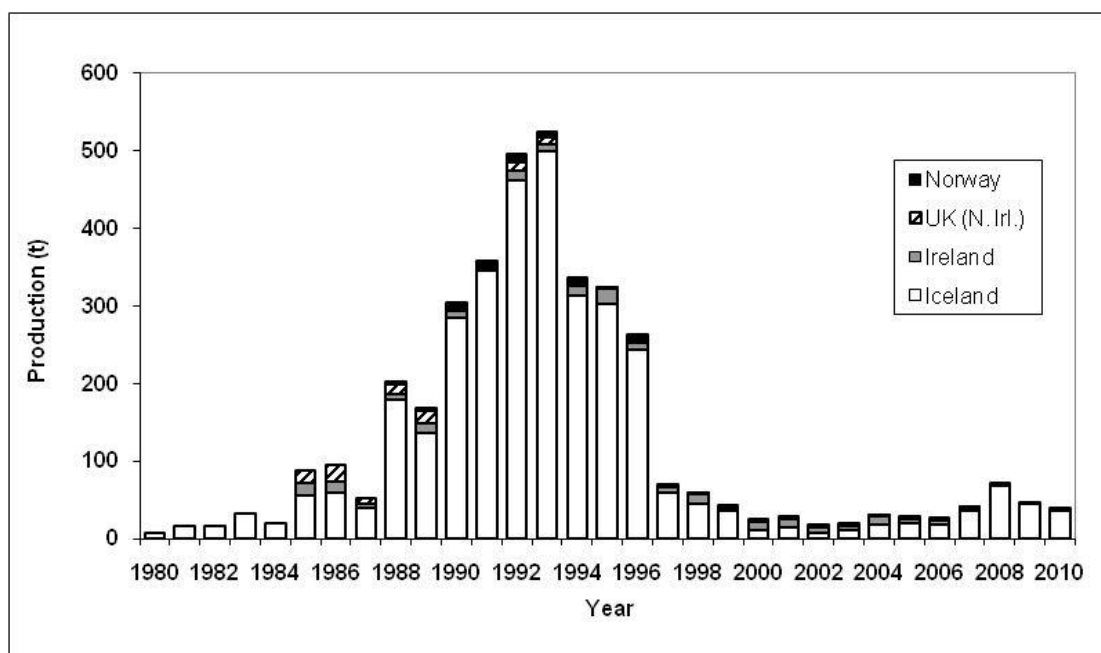


Figure 10.15.5. Production of ranched Atlantic salmon (tonnes round fresh weight) in the North Atlantic, 1980 to 2010.

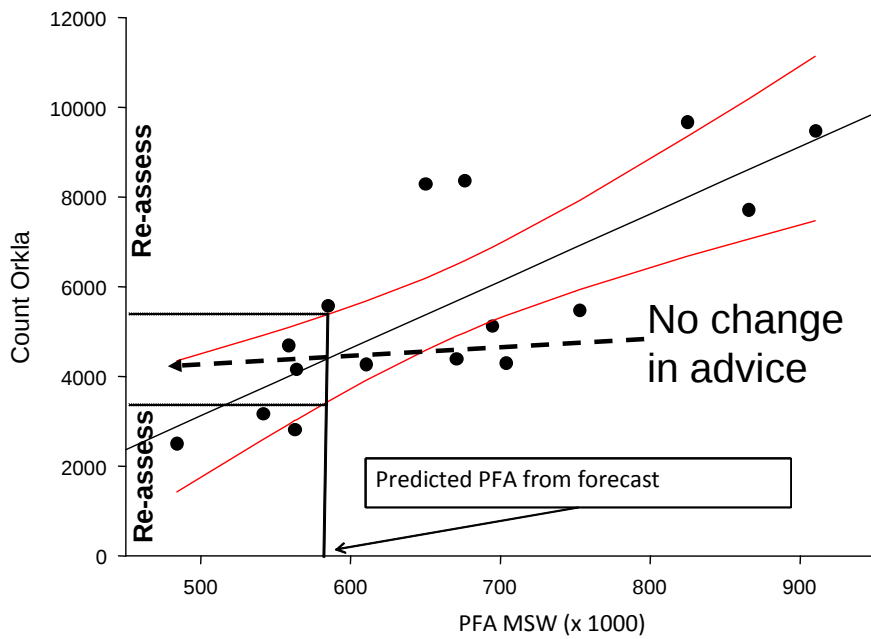


Figure 10.1.11.1. Example of an indicator for the proposed Framework of Indicators (FWI) for NEAC and how the reassessment intervals for the indicators are computed. The values of an indicator (counts) are plotted against the PFA. Regression line and 95% confidence limits are shown. From the forecasted PFA in the year in question the values of the indicator corresponding to the upper and lower 95% confidence interval are estimated. Reassessment is suggested when an indicator value falls outside of these limits .

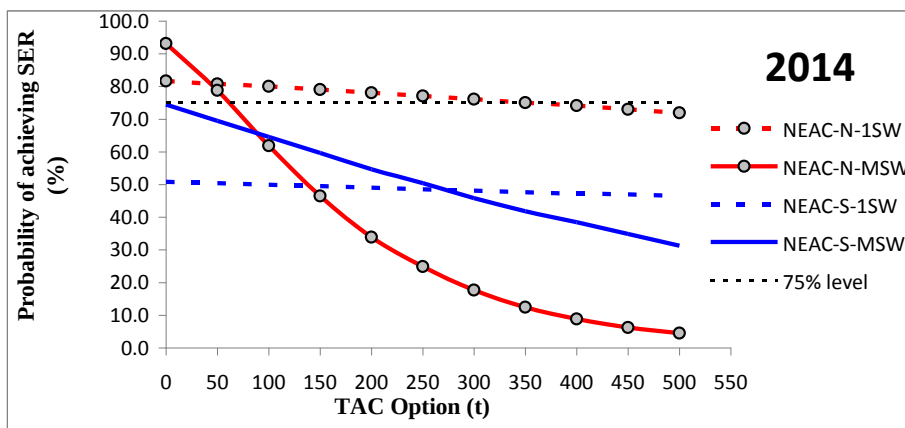
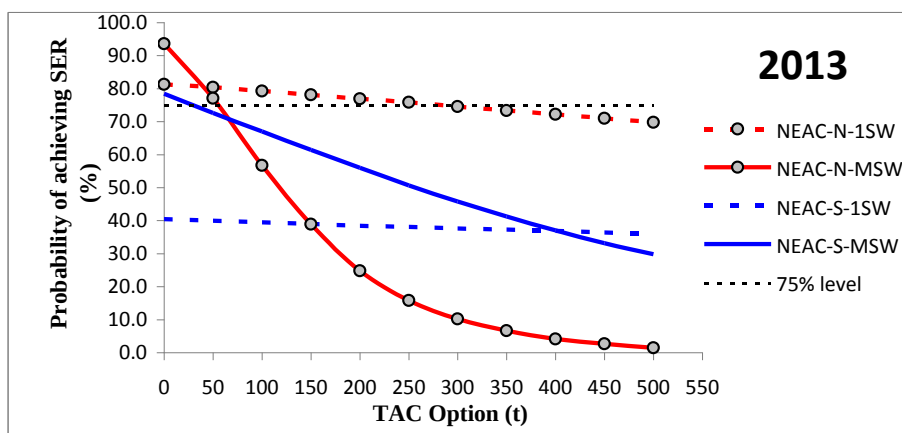
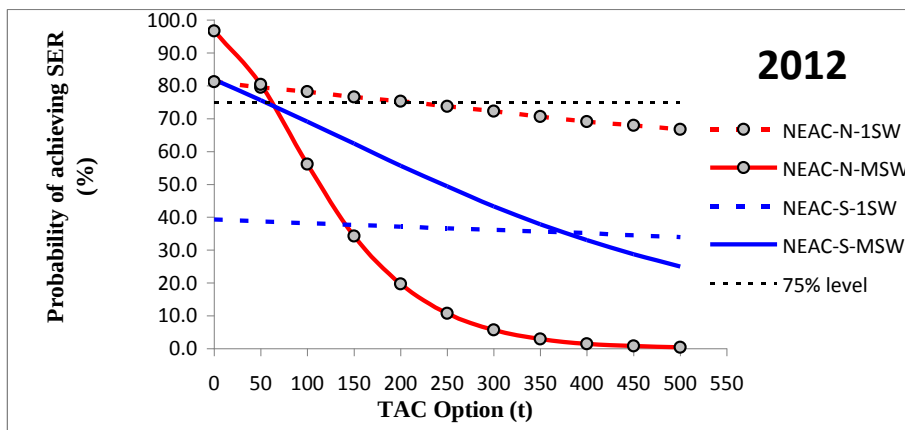


Figure 10.1.12.1. Probability (%) of 1SW and MSW salmon in Northern and Southern NEAC areas achieving their SERs for different catch options in Faroes for the years 2012 to 2014.

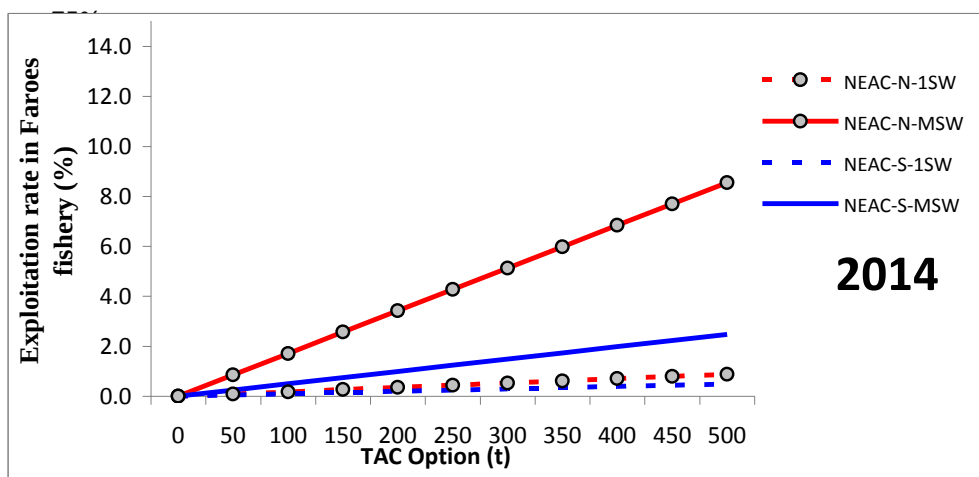
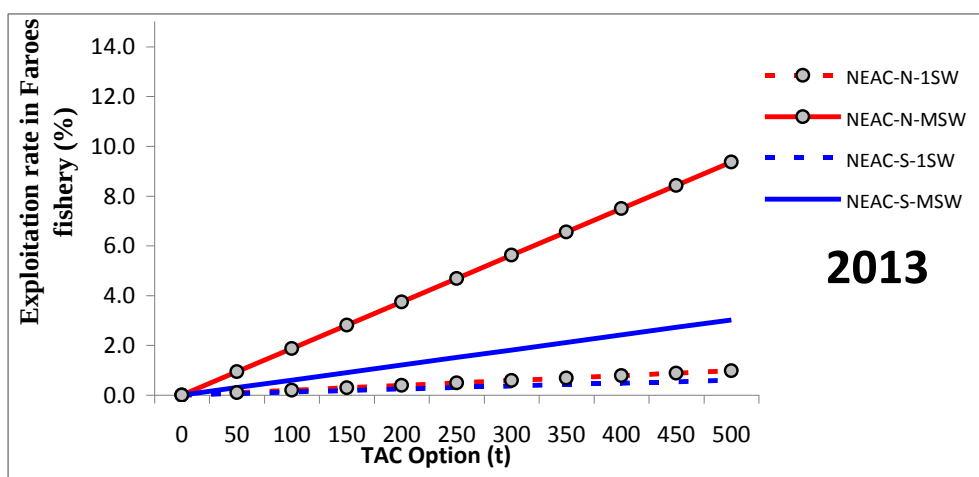
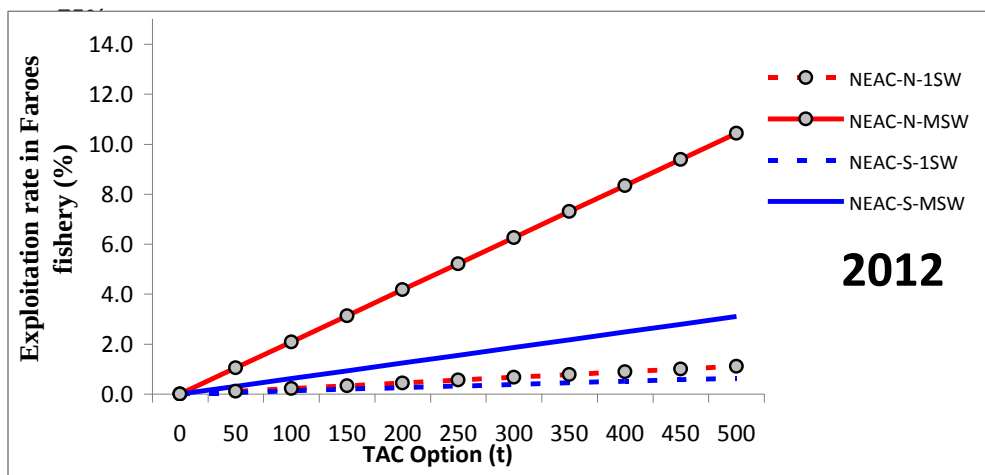


Figure 10.1.12.2. Forecast exploitation rate (%) of 1SW and MSW salmon from Northern and Southern NEAC areas in the Faroes fishery for different catch options in the years 2012 to 2014.

10.1.5.1 Reported total nominal catch of salmon by country (in tonnes round fresh weight), 1960 to 2010. (2010 figures include provisional data).

Year	NAC Area			NEAC (N. Area)							NEAC (S. Area)					Faroes & Greenland				Total	Unreported catches		
	Canada (1)	USA	St. P&M	Norway (2)	Russia (3)	Iceland		(West) (4)	Denmark	Finland	Ireland (E & W) (5,6)	UK (N.Irl.) (6,7)	UK (Scotl.) (8)	France (9)	Spain (10)	Faroes (11)	Grld. (12)	Grld. (13)	Other (14)	Reported Nominal Catch	NASCO Areas (13)	International waters (14)	
						Wild	Ranch																
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 10.1.5.1 continued.

Year	NAC Area			NEAC (N. Area)							NEAC (S. Area)					Faroes & Greenland				Total Reported Nominal Catch	Unreported catches		
	Canada (1)	USA	St. P&M	Norway (2)	Russia (3)	Iceland		(West) (4)	Denmark	Finland	Ireland (5,6)	(E & W) (N.Irl.) (6,7)	UK (Scotl.) (8)	France (9)	Spain (10)	Faroes (10)	Grld. (11)	Grld. (11)	Other (12)		NASCO Areas (13)	International waters (14)	
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	4	-	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	-	2,395	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	99	11	25	4	78	551	89	56	192	13	9	0	0	9	-	2,457	847	-
2004	161	0	3	784	82	111	18	20	4	39	489	111	48	245	19	7	0	0	15	-	2,157	686	-
2005	139	0	3	888	82	129	21	15	8	47	422	97	52	215	11	13	0	0	15	-	2,156	700	-
2006	137	0	3	932	91	93	17	14	2	67	326	80	29	192	13	11	0	0	22	-	2,029	670	-
2007	112	0	2	767	63	93	36	16	3	58	85	67	30	169	11	9	0	0	25	-	1,546	475	-
2008	158	0	4	807	73	132	69	18	9	71	89	64	21	160	12	9	0	0	26	-	1,720	443	-
2009	126	0	3	595	71	122	44	17	8	36	68	54	17	120	4	2	0	0	26	-	1,313	327	-
2010	146	0	3	642	88	124	36	22	13	49	99	113	16	189	10	2	0	0	40	-	1,589	367	-
Average																							
2005-2009	134	0	3	798	76	114	37	16	6	56	198	72	30	171	10	9	0	0	23	-	1,753	523	-
2000-2009	142	0	3	931	92	102	25	22	5	71	406	113	46	201	12	9	1	0	21	-	2,201	764	-

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 recreational (rod) fishery.
- From 1990, catch includes fish ranched 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 since 2007 and for Russia since 2008.
- Estimates refer to season ending in given year.

Table 10.1.5.2. Numbers of fish caught and released in rod fisheries along with the % of the total rod catch (released + retained) for countries in the North Atlantic where records are available, 1991-2010. Figures for 2010 are provisional.

Year	Canada		USA		Iceland		Russia ¹		UK (E&W)		UK (Scotland)		Ireland		UK (N Ireland) ²		Denmark		Norway ³	
	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch
1991	28,497	33	239	50			3,211	51												
1992	46,450	34	407	67			10,120	73												
1993	53,849	41	507	77			11,246	82	1,448	10										
1994	61,830	39	249	95			12,056	83	3,227	13	6,595	8								
1995	47,679	36	370	100			11,904	84	3,189	20	12,151	14								
1996	52,166	33	542	100	669	2	10,745	73	3,428	20	10,413	15								
1997	57,252	49	333	100	1,558	5	14,823	87	3,132	24	10,965	18								
1998	62,895	53	273	100	2,826	7	12,776	81	5,365	31	13,464	18								
1999	55,331	50	211	100	3,055	10	11,450	77	5,447	44	14,846	28								
2000	64,482	55	0	-	2,918	11	12,914	74	7,470	42	21,072	32								
2001	59,387	55	0	-	3,611	12	16,945	76	6,143	43	27,724	38								
2002	50,924	52	0	-	5,985	18	25,248	80	7,658	50	24,058	42								
2003	53,645	55	0	-	5,361	16	33,862	81	6,425	56	29,170	55								
2004	62,316	55	0	-	7,362	16	24,679	76	13,211	48	46,279	50					255	19		
2005	63,005	62	0	-	9,224	17	23,592	87	11,983	56	46,165	55	2,553	12			606	27		
2006	60,486	62	1	100	8,735	19	33,380	82	10,959	56	47,669	55	5,409	22	302	18	794	65		
2007	44,423	60	3	100	9,691	18	44,341	90	10,917	55	55,660	61	13,125	40	470	16	959	57		
2008	58,004	54	61	100	17,178	20	41,881	86	13,035	55	53,347	62	13,312	37	648	20	2,033	71	5,512	5
2009	55,178	60	0	-	17,514	24	-	-	9,096	58	48,371	67	10,265	37	847	21	1,709	53	6,696	6
2010	58,297	57	0	-	20,345	28	14,585	56	14,103	59	81,497	70	15,136	40	1024	21	2,512	60	15,041	12
5-yr mean 2005-2009	56,219	60			12,468	20			11,198	56	50,242	60	9,967	31			1,220	55		
% change on 5-year mean	+4	-+4			+63	+43			+26	+5	+62	+18	+52	+28			+106	+10		

Key: ¹ No data were provided by the authorities for 2009 and data for 2010 were incomplete, however catch-and-release is understood to have remained at similar high levels.

² Data for 2006-2009 is for the DCAL area only; the figure for 2010 is a total for N.Ireland.

³ The statistics were collected on a voluntary basis, the numbers reported must be viewed as a minimum.

Table 10.1.5.3. Estimates of unreported catches by various methods in tonnes by country within national EEZs in the North East Atlantic, North American, and West Greenland Commissions of NASCO, 2010.

Commission Area	Country	Unreported Catch t	Unreported as % of Total North Atlantic Catch (Unreported + Reported)	Unreported as % of Total National Catch (Unreported + Reported)
NEAC	Denmark	4	0.2	25
NEAC	Finland	8	0.4	14
NEAC	Iceland	12	0.6	7
NEAC	Ireland	10	0.5	9
NEAC	Norway	275	13.9	30
NEAC	Sweden	2	0.1	8
NEAC	France	1	0.0	5
NEAC	UK (E & W)	20	1.0	15
NEAC	UK (N.Ireland)	0	0.0	0
NEAC	UK (Scotland)	25	1.3	12
NAC	USA	0	0.0	0
NAC	Canada	15	0.8	9
WGC	West Greenland	10	0.5	20
	Total Unreported Catch *	382	19.4	
	Total Reported Catch of North Atlantic salmon	1,591		

* No unreported catch estimate available for Russia in 2010. Data for Canada are incomplete.
Unreported catch estimates not provided for Spain & St. Pierre et Miquelon

Table 10.1.10.1. Summary of Atlantic salmon tagged and marked in 2010 – ‘Hatchery’ and ‘Wild’ refer to smolts and parr; ‘Adults’ relates to both wild and hatchery-origin fish.

Country	Origin	Microtag	External mark	Adipose clip	Other Internal ¹	Total
Canada	Hatchery Adult	0	0	21	301	322
	Hatchery Juvenile	0	3,877	716,904	0	720,781
	Wild Adult ²	0	4,847	2,020	874	7,741
	Wild Juvenile ²	0	18,512	35,615	266	54,393
	Total	0	27,236	754,560	1,441	783,237
Denmark	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	77,000	0	240,995	0	317,995
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	77,000	0	240,995	0	317,995
France	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile ³	0	178,200	266,174	0	444,374
	Wild Adult ³	0	241	0	0	241
	Wild Juvenile	2,394	2,582	0	0	4,976
	Total	2,394	181,023	266,174	0	449,591
Germany	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	18,694	0	30,950	0	49,644
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	18,694	0	30,950	0	49,644
Iceland	Hatchery Adult	0	6	0	0	6
	Hatchery Juvenile	44,064	0	0	0	44,064
	Wild Adult	0	188	0	0	188
	Wild Juvenile	3,503	0	0	0	3,503
	Total	47,567	194	0	0	47,761
Ireland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	197,852	0	368,950	0	566,802
	Wild Adult	0	0	0	0	0
	Wild Juvenile	5,020	0	5,020	0	10,040
	Total	202,872	0	373,970	0	576,842
Norway	Hatchery Adult	0	6,000	0	0	6,000
	Hatchery Juvenile	72,491	24,626	0	0	97,117
	Wild Adult	0	1,087	0	6,877	7,964
	Wild Juvenile	3,072	2,781	0	0	5,853
	Total	75,563	34,494	0	6,877	116,934
Russia	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	1,344,059	0	1,344,059
	Wild Adult	0	2,861	0	0	2,861
	Wild Juvenile	0	0	0	0	0
	Total	0	2,861	1,344,059	0	1,346,920
Sweden	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	3000	174,017	0	177,017
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	500	0	0	500
	Total	0	3,500	174,017	0	177,517
UK (England & Wales)	Hatchery Adult	0	1,224	0	0	1,224
	Hatchery Juvenile	13,800	0	109,610	0	123,410
	Wild Adult	0	0	0	0	0
	Wild Juvenile	9,963	0	11,405	0	21,368
	Total	23,763	1,224	121,015	0	146,002
UK (N. Ireland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	21,091	0	53,499	0	74,590
	Wild Adult	0	0	0	0	0
	Wild Juvenile	1315	0	0	0	1,315
	Total	22,406	0	53,499	0	75,905
UK (Scotland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	0	3,020	3,020
	Wild Adult	0	1,361	0	3	1,364
	Wild Juvenile	1919	0	0	3,082	5,001
	Total	1,919	1,361	0	6,105	9,385
USA	Hatchery Adult	1,771	1,180	227	0	3,178
	Hatchery Juvenile	40,558	0	592,274	0	632,832
	Wild Adult	788	0	0	0	788
	Wild Juvenile	252	0	162,124	0	162,376
	Total	43,369	1,180	754,625	0	799,174
All Countries	Hatchery Adult	1,771	8,410	248	301	10,730
	Hatchery Juvenile	485,550	209,703	3,897,432	3,020	4,595,705
	Wild Adult	788	10,585	2,020	7,754	21,147
	Wild Juvenile	27,438	24,375	214,164	3,348	269,325
	Total	515,547	253,073	4,113,864	14,423	4,896,907

¹ Includes other internal tags (PIT, ultrasonic, radio, DST, etc.)

² May include hatchery fish.

³ Includes external dye mark.

Table 10.1.11.1. Performance of the various candidate indicators that were explored for the NEAC framework of indicators.

Southern NEAC 1SW			
Candidate indicator data set	N	R ²	Retained?
Ret. to coast 1SW UK(NI) Bush M	18	0.64	Yes
Catch MSW Ice Ellidaar M	39	0.63	Yes
Ret. W 1SW UK(E&W) Itchen M	21	0.48	Yes
Ret. W MSW UK(E&W) Itchen M	23	0.46	Yes
Ret. W 1SW UK(Sc) North Esk M	30	0.45	Yes
Ret. MSW UK(E&W) Frome M	38	0.37	Yes
Ret. W 2SW UK(Scot.) Baddoch M	23	0.32	Yes
Ret. 1SW UK(E&W) Frome M	36	0.29	Yes
Ret. W 2SW UK(Scot.) Girnock M	39	0.24	Yes
Ret. W 1SW UK(E&W) Test M	21	0.21	Yes
Ret. W MSW UK(E&W) Test M	23	0.08	No
Ret. W 2SW UK(Sc) North Esk M	30	0.02	No
Ret. 1SW UK(E&W) Dee M	17	0.01	No
Ret. MSW UK(E&W) Dee M	19	0.01	No
Southern NEAC MSW			
Candidate indicator data set	N	R ²	Retained?
Ret. W MSW UK(E&W) Itchen NM	23	0.73	Yes
Ret. to coast 1SW UK(N.Irl) Bush NM	18	0.69	Yes
Ret. W 2SW UK(Scot) Baddoch NM	23	0.47	Yes
Catch MSW Iceland Ellidaar NM	39	0.55	Yes
Ret. 1SW UK(Sc) North Esk NM	30	0.35	Yes
Ret. MSW UK(E&W) Frome NM	38	0.45	Yes
Ret. 1SW UK(E&W) Frome NM	36	0.37	Yes
Ret. W 2SW UK(Sc) North Esk NM	30	0.30	Yes
Ret. W 2SW UK(Scot) Girnock NM	39	0.22	Yes
Ret. W 1SW UK(E&W) Itchen NM	21	0.28	Yes
Ret. W 1SW UK(E&W) Test NM	21	0.15	No
Ret. W MSW UK(E&W) Test NM	23	0.11	No
Ret. 1SW UK(E&W) Dee NM	17	0.08	No
Ret. MSW (UK(E&W) Dee NM	19	0.02	No
Northern NEAC 1SW			
Candidate indicator data set	N	R ²	Retained?
Ret. all 1SW Nor PFA est	22	0.91	Yes
Surv W 1SW Nor Imsa	28	0.40	Yes
Surv H 1SW Nor Imsa	27	0.26	Yes
Catch All 1SW Fin	28	0.12	No
Northern NEAC MSW			
Candidate indicator data set	N	R ²	Retained?
PFA-MSW-CoastNorway	22	0.70	Yes
Orkla counts	16	0.62	Yes
Surv H 2SW Nor Drammen	25	0.59	Yes
Ret all 2SW Nor PFA est	18	0.54	Yes
Målselv counts	20	0.24	Yes
Catch W 2SW Fin	25	0.04	No

Table 10.12.1. Historic sharing of catches of NAC (2SW) and NEAC (all ages) salmon between West Greenland, Faroes, and homewater fisheries. Proportions are estimated from means of catches in the previous 5 years.

	West Greenland catch	WG prop. NAC	WG catch of NAC salmon	WG catch of NEAC salmon	Canada catch - large salmon	Faroes catch	NEAC Hm'water catch	Proportions of catch of NAC 2SW salmon taken in:		Proportions of catch of Southern NEAC salmon taken in:		
	(t)		(t)	(t)	(t)	(t)	(t)	WG	NAC (yr +1)	NEAC-home	Faroes	WG
1971	2,689	0.34	914	1,775	1,482	0	-	-	-	-	-	-
1972	2,113	0.36	761	1,352	1,201	9	6,558	-	-	-	-	-
1973	2,341	0.49	1,147	1,194	1,651	28	7,311	-	-	-	-	-
1974	1,917	0.43	824	1,093	1,589	20	7,004	-	-	-	-	-
1975	2,030	0.44	893	1,137	1,573	28	7,070	37.0	63.0	-	-	-
1976	1,175	0.43	505	670	1,721	40	5,296	32.9	67.1	83.3	0.3	16.4
1977	1,420	0.45	639	781	1,883	40	5,183	33.4	66.6	85.0	0.4	14.5
1978	984	0.43	423	561	1,225	37	4,939	31.6	68.4	85.4	0.5	14.1
1979	1,395	0.50	698	698	705	119	5,035	30.2	69.8	85.9	0.8	13.2
1980	1,194	0.52	621	573	1,763	536	5,396	28.6	71.4	84.8	2.5	12.6
1981	1,264	0.59	746	518	1,619	1,025	4,873	32.8	67.2	83.5	5.8	10.8
1982	1,077	0.57	614	463	1,082	606	4,434	33.8	66.2	81.9	7.7	10.4
1983	310	0.40	124	186	911	678	5,825	31.8	68.2	81.6	9.5	9.0
1984	297	0.54	160	137	645	628	4,724	32.1	67.9	81.0	11.1	7.8
1985	864	0.47	406	458	540	566	5,456	34.1	65.9	82.5	11.4	6.1
1986	960	0.59	566	394	779	530	6,096	32.8	67.2	84.8	9.6	5.6
1987	966	0.59	570	396	951	576	4,763	34.0	66.0	85.3	9.5	5.2
1988	893	0.43	384	509	633	243	5,072	37.4	62.6	86.4	8.4	5.2
1989	337	0.55	185	152	590	364	3,910	38.0	62.0	85.8	7.7	6.4
1990	274	0.74	203	71	486	315	3,112	38.6	61.4	85.4	7.5	7.1
1991	472	0.63	297	175	370	95	2,460	40.6	59.4	86.1	7.1	6.8
1992	237	0.45	107	130	323	23	2,836	37.2	62.8	88.1	5.3	6.6
1993	-	-	0	0	214	23	2,772	33.0	67.0	89.0	4.8	6.1
1994	-	-	0	0	216	6	3,243	32.2	67.8	93.6	3.0	3.4
1995	83	0.67	56	27	153	5	2,963	30.2	69.8	96.4	1.0	2.5
1996	92	0.70	64	28	154	0	2,492	20.8	79.2	97.4	0.4	2.3
1997	58	0.85	49	9	126	0	2,006	19.1	80.9	98.4	0.2	1.4
1998	11	0.79	9	2	70	6	2,165	23.9	76.1	99.4	0.1	0.5
1999	19	0.91	17	2	64	0	2,026	29.3	70.7	99.3	0.1	0.6
2000	21	0.65	14	7	58	8	2,700	28.8	71.2	99.3	0.1	0.6
2001	43	0.67	29	14	61	0	2,845	28.1	71.9	99.5	0.1	0.4
2002	9	0.72	6	3	49	0	2,472	20.4	79.6	99.6	0.1	0.3
2003	9	0.65	6	3	60	0	2,275	19.6	80.4	99.7	0.1	0.2
2004	15	0.72	11	4	68	0	1,936	18.3	81.7	99.7	0.1	0.2
2005	15	0.76	11	4	56	0	1,959	18.1	81.9	99.7	0.0	0.3
2006	22	0.69	15	7	55	0	1,838	14.8	85.2	99.7	0.0	0.3
2007	25	0.76	19	6	48	0	1,359	21.6	78.4	99.8	0.0	0.2

Table 10.1.12.2. Catch in weight (t) and numbers, mean weight, and mean age of catch in the 1983/1984 to 1995/1996 fishing seasons.

	Season	Catch (t)	Catch (No)	Mean wt (kg)	Mean sea age
Commercial fishery	1983/84	651	124,509	5.23	2.07
	1984/85	598	135,777	4.40	2.07
	1985/86	545	154,554	3.53	2.02
	1986/87	539	140,304	3.84	2.05
	1987/88	208	65,011	3.20	1.96
	1988/89	309	93,496	3.30	2.04
	1989/90	364	111,515	3.26	2.04
	1990/91	202	57,441	3.52	2.07
Research fishery	1991/92	31	8,464	3.66	2.09
	1992/93	22	5,415	4.06	2.14
	1993/94	7	2,072	3.38	2.03
	1994/95	6	1,963	3.06	1.98
	1995/96	1	282	3.55	

Table 10.1.12.3. Catch in numbers and percentages by sea age and mean age in the Faroes salmon fishery in the 1983/1984 to 1994/1995 fishing seasons.

Fishery	Season	1SW	2SW	3SW	MSW	%1SW	%2SW	%3SW	Mean Age
Comm'	1983/84	5,142	135,718	16,401	152,178	3.3%	86.3%	10.4%	2.07
	1984/85	381	138,375	11,358	149,733	0.3%	92.2%	7.6%	2.07
	1985/86	2,021	169,461	5,671	175,219	1.1%	95.7%	3.2%	2.02
	1986/87	71	124,628	6,621	131,324	0.1%	94.9%	5.0%	2.05
	1987/88	5,833	55,726	3,450	59,176	9.0%	85.7%	5.3%	1.96
	1988/89	1,351	110,717	5,728	116,445	1.1%	94.0%	4.9%	2.04
	1989/90	2,155	102,800	6,473	109,273	1.9%	92.3%	5.8%	2.04
	1990/91	632	52,419	4,390	56,809	1.1%	91.3%	7.6%	2.07
Research	1991/92	248	4,686	743	5,429	4.4%	82.5%	13.1%	2.09
	1992/93	521	2,646	1,120	3,766	12.2%	61.7%	26.1%	2.14
	1993/94	320	1,288	376	1,664	16.1%	64.9%	19.0%	2.03
	1994/95	206	1,585	166	1,751	10.5%	81.0%	8.5%	1.98
Totals		18,881	900,049	62,497	962,767	1.9%	91.7%	6.4%	2.04

1991/92 to 1994/95 include discards and exclude reared fish.

Table 10.1.12.4. Probability (%) of 1SW and MSW salmon in Northern and Southern NEAC areas achieving their SERs for different catch options (t) in Faroes for the years 2012 to 2014.

Catch options for 2012:	TAC option	NEAC-N-1SW	NEAC-N-MSW	NEAC-S-1SW	NEAC-S-MSW
	0	81.2	96.6	39.3	81.8
	50	79.5	80.4	38.8	75.6
	100	78.2	56.1	38.2	69.1
	150	76.6	34.2	37.7	62.4
	200	75.2	19.7	37.1	55.7
	250	73.7	10.7	36.6	49.4
	300	72.2	5.7	36.1	43.3
	350	70.6	2.9	35.6	37.9
	400	69.1	1.5	35.1	33.0
	450	67.9	0.8	34.5	28.8
	500	66.7	0.4	33.9	25.0

Catch options for 2013:	TAC option	NEAC-N-1SW	NEAC-N-MSW	NEAC-S-1SW	NEAC-S-MSW
	0	81.3	93.6	40.4	78.4
	50	80.4	77.0	40.0	72.6
	100	79.3	56.7	39.4	67.0
	150	78.2	38.9	39.0	61.4
	200	76.9	24.8	38.4	56.0
	250	75.9	15.8	38.1	50.7
	300	74.5	10.2	37.6	45.8
	350	73.3	6.7	37.3	41.3
	400	72.2	4.1	36.8	37.0
	450	71.0	2.7	36.4	33.2
	500	69.8	1.5	36.0	29.8

Catch options for 2014:	TAC option	NEAC-N-1SW	NEAC-N-MSW	NEAC-S-1SW	NEAC-S-MSW
	0	81.7	93.1	50.8	74.4
	50	80.8	78.8	50.4	69.4
	100	80.0	61.8	49.9	64.6
	150	79.0	46.5	49.5	59.6
	200	78.1	33.9	49.0	54.7
	250	77.1	24.9	48.5	50.4
	300	76.1	17.7	48.1	45.8
	350	75.0	12.4	47.6	41.8
	400	74.1	8.9	47.2	38.4
	450	73.0	6.2	46.9	34.8
	500	71.9	4.5	46.5	31.3

Table 10.1.12.5. Forecast exploitation rate (%) of 1SW and MSW salmon from Northern and Southern NEAC areas in the Faroes fishery for different catch options in the years 2012 to 2014.

Catch options for 2012:	TAC option	NEAC-N- 1SW	NEAC-N- MSW	NEAC-S- 1SW	NEAC-S- MSW
	0	0.0	0.0	0.0	0.0
	50	0.1	1.0	0.1	0.3
	100	0.2	2.1	0.1	0.6
	150	0.3	3.1	0.2	0.9
	200	0.4	4.2	0.3	1.2
	250	0.6	5.2	0.3	1.6
	300	0.7	6.3	0.4	1.9
	350	0.8	7.3	0.4	2.2
	400	0.9	8.3	0.5	2.5
	450	1.0	9.4	0.6	2.8
	500	1.1	10.4	0.6	3.1

Catch options for 2013:	TAC option	NEAC-N- 1SW	NEAC-N- MSW	NEAC-S- 1SW	NEAC-S- MSW
	0	0.0	0.0	0.0	0.0
	50	0.1	0.9	0.1	0.3
	100	0.2	1.9	0.1	0.6
	150	0.3	2.8	0.2	0.9
	200	0.4	3.7	0.2	1.2
	250	0.5	4.7	0.3	1.5
	300	0.6	5.6	0.4	1.8
	350	0.7	6.6	0.4	2.1
	400	0.8	7.5	0.5	2.4
	450	0.9	8.4	0.5	2.7
	500	1.0	9.4	0.6	3.0

Catch options for 2014:	TAC option	NEAC-N- 1SW	NEAC-N- MSW	NEAC-S- 1SW	NEAC-S- MSW
	0	0.0	0.0	0.0	0.0
	50	0.1	0.9	0.0	0.2
	100	0.2	1.7	0.1	0.5
	150	0.3	2.6	0.1	0.7
	200	0.4	3.4	0.2	1.0
	250	0.4	4.3	0.2	1.2
	300	0.5	5.1	0.3	1.5
	350	0.6	6.0	0.3	1.7
	400	0.7	6.8	0.4	2.0
	450	0.8	7.7	0.4	2.2
	500	0.9	8.5	0.5	2.5

Table 10.1.12.6. Information on the status of national stocks and individual river stocks within each jurisdiction in the NEAC area.

Country	Meeting National CL	Meeting National CL	No. rivers	No. with CL Total	No. assessed for compliance	No. meeting CL Total	%meeting CL Total
	1SW	MSW					
Iceland	Yes	Yes	100	0		NA	NA
Russia	Yes	Yes	112	80	8	7	87.5
Norway	Yes	Yes	450	439	211	74	35
Sweden	No	No	23	17	0	NA	NA
Finland/Norway (Tana/Teno)	No	No	1	1	1	0	0
UK Scotland	Yes	Yes	383	0	0	NA	NA
UK England/Wales	No	Yes	68	68	64	38	59.0
UK N. Ireland	Yes	Yes	15	7	7	2	28.6
Ireland	Yes	No	141	141	141	60	42.6
France	No	No	25	25	17	3	17.6
Germany	Not assessed						
Spain	Not assessed						
Portugal	Not assessed						

Annex 10.1 Glossary of acronyms

1SW (*One-Sea-Winter*) Maiden adult salmon that has spent one winter at sea.

2SW (*Two-Sea-Winter*) Maiden adult salmon that has spent two winters at sea.

ASF (*Atlantic Salmon Federation*)

BCI (*Bayesian Credible Interval*) The Bayesian equivalent of a confidence interval. If the 90% BCI for a parameter A is 10 to 20, there is a 90% probability that A falls between 10 and 20.

C&R (*Catch and Release*) Catch and release is a practice within recreational fishing intended as a technique of conservation. After capture, the fish are unhooked and returned to the water before experiencing serious exhaustion or injury. Using barbless hooks, it is often possible to release the fish without removing it from the water (a slack line is frequently sufficient).

CL, i.e. S_{lim} (*Conservation Limit*) Demarcation of undesirable stock levels or levels of fishing activity. The ultimate objective when managing stocks and regulating fisheries will be to ensure that there is a high probability that undesirable levels are avoided.

CPUE (*Catch Per Unit Effort*) A derived quantity obtained from the independent values of catch and effort.

CWT (*Coded Wire Tag*) The CWT is a length of magnetized stainless steel wire 0.25 mm in diameter. The tag is marked with rows of numbers denoting specific batch or individual codes. Tags are cut from rolls of wire by an injector that hypodermically implants them into suitable tissue. The standard length of a tag is 1.1 mm.

DFO (*Department of Fisheries and Oceans*) DFO and its Special Operating Agency, the Canadian Coast Guard, deliver programmes and services that support sustainable use and development of Canada's waterways and aquatic resources.

EU DCR (*The EU Data Collection Regulation*) DCR established a community framework for the collection, management, and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy.

FV (*Fishing Vessel*) A vessel that undertakes cruise for commercial fishing purposes.

FWI (*Framework of Indicators*)

GIS (*Geographic Information Systems*) A computer technology that uses a geographic information system as an analytic framework for managing and integrating data.

GSI (*Genetic Stock Identification*) Methods used to 'genetically type' salmon from particular regions and rivers across Atlantic.

ICPR (*The International Commission for the Protection of the River Rhine*) ICPR coordinates the ecological rehabilitation programme involving all countries bordering the river Rhine. This programme was initiated in response to catastrophic river pollution in Switzerland in 1986 which killed hundreds of thousands of fish. The programme aims to bring about significant ecological improvement of the Rhine and its tributaries, allowing the re-establishment of migratory fish species such as salmon.

ISAV (*Infectious Salmon Anemia Virus*) ISA is a highly infectious disease of Atlantic salmon caused by an enveloped virus.

MSW (*Multi-Sea-Winter*) An adult salmon which has spent two or more winters at sea, or a repeat spawner.

MSY (*Maximum Sustainable Yield*) The largest average annual catch that may be taken from a stock continuously without affecting the catch of future years; a constant long-term MSY is not a reality in most fisheries, where stock sizes vary with the strength of year classes moving through the fishery.

NAC (*North American Commission*)

NASCO (*North Atlantic Salmon Conservation Organization*)

NEAC (*North-East Atlantic Commission*)

PFA (*Pre-Fishery Abundance*) The numbers of salmon from a particular stock estimated to be alive in the ocean at a specified time.

PIT (*Passive Integrated Transponder*) PIT tags use radio frequency identification technology. PIT tags lack an internal power source. They are energized on encountering an electromagnetic field emitted from a transceiver. The tag's unique identity code is programmed into the microchip's nonvolatile memory.

Q Areas for which the Ministère des Ressources naturelles et de la Faune manages the salmon fisheries in Québec.

RR (*Run–Reconstruction Model*)

RST (*Rotary Screw Trap*)

RV (*Research Vessel*) A vessel that undertakes cruises to conduct scientific research.

RVS (*Red Vent Syndrome*) The condition, known as RVS, has been noted since 2005, and 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 migratory species. The larval nematode stages in fish are usually found spirally coiled on the mesenteries, internal organs, and less frequently in the somatic muscle of host fish.

RW (*The Random Walk*) In the RW hypothesis, the recruitment rates are modelled as a first order time varying parameter following a simple random walk with a flat prior on the first value of the time-series. The model can be used both for retrospective analysis and forecasts.

SAC (*Special Areas of Conservation*) To comply with the EU Habitats Directive (92/43/EEC) on Conservation of Natural Habitat and of Wild Fauna and Flora, which stipulates that member states maintain or restore habitats and species to favourable conservation status, a number of rivers in the NEAC area that support important populations of vulnerable qualifying species have been designated SACs. Where salmon is a “qualifying species”, additional protection measures specifically for salmon are required.

SER (*Spawning Escapement Reserve*) The CL increased to take account of natural mortality between the recruitment date (1st January) and return to home waters.

SFA (*Salmon Fishing Areas*) Areas for which the Department of Fisheries and Oceans (DFO) Canada manages the salmon fisheries.

SGBICEPS (*Study Group on the Identification of Biological Characteristics for Use as Predictors of Salmon Abundance*) The ICES Study Group established to complete a review of the available information on the life-history strategies of salmon and changes in the biological characteristics of the fish in relation to key environmental variables.

SGEFISSA (*Study Group on Establishing a Framework of Indicators of Salmon Stock Abundance*) A Study Group established by ICES which met in November 2006.

SGSSAFE (*Study Group on Salmon Stock Assessment and Forecasting*). The Study Group established to work on the development of new and alternative models for forecasting Atlantic salmon abundance and for the provision of catch advice.

S_{lim}, i.e. CL (*Conservation Limit*) Demarcation of undesirable stock levels or levels of fishing activity; the ultimate objective when managing stocks and regulating fisheries will be to ensure that there is a high probability that the undesirable levels are avoided.

TAC (*Total Allowable Catch*) The quantity of fish that can be taken from each stock each year.

VIE (*Visual Implant Elastomer*) The VIE tags consist of fluorescent elastomer material which is subcutaneously injected as a liquid into transparent or translucent tissue via a hand-held injector.

WFD (*Water Framework Directive*) Directive 2000/60/EC (WFD) aims to protect and enhance the water environment, updates all existing relevant European legislation, and promotes a new approach to water management through river-based planning. The Directive requires the development of River Basin Management Plans (RBMP) and Programmes of Measures (PoM) with the aim of achieving Good Ecological Status or, for artificial or more modified waters, Good Ecological Potential.

WGC (*West Greenland Commission*)

WKDUHSTI (*Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas*) The first of three workshops established by ICES to record and analyse data from old tagging experiments. WKDUHSTI was held in February 2007.

WKSHINI (*Workshop on Salmon Historical Information – New Investigations from Old Tagging Data*) The second of three workshops established by ICES to record and analyse data from old tagging experiments. WKSHINI was held 18–20 September 2008 in Halifax, Canada.

WKLUSTRE (*Workshop on Learning from Salmon Tagging Records*) The third of three workshops established by ICES to record and analyse data from old tagging experiments. WKLUSTRE was tasked with completing the compilation of available data and analyses of the resulting distributions of salmon at sea and was held in London from 16 to 18 September 2009.

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CNL(11)9

***Report of the Tenth Meeting of the
International Atlantic Salmon Research Board
Hotel Arctic, Ilulissat, Greenland
3 June, 2011***

1. Opening of the meeting

- 1.1 The Chairman, Professor Ken Whelan, opened the meeting and welcomed members of the Board, their scientific advisers and representatives of the accredited NGOs to Ilulissat.
- 1.2 A list of participants is contained in Annex 1.

2. Adoption of the agenda

- 2.1 The Board adopted its agenda, ICR(11)6 (Annex 2).

3. Election of Officers

- 3.1 The Board elected Mr Raoul Bierach (Norway) as its Chairman, to serve from the close of the Tenth Annual Meeting of the International Atlantic Salmon Research Board. The Board thanked Professor Whelan for his excellent service over the last four years which had seen major progress in implementing the SALSEA Programme.

4. Report of the Scientific Advisory Group

- 4.1 The Chairman of the Board's Scientific Advisory Group (SAG), Mr Tim Sheehan, presented a report on the Group's meeting, SAG(11)4 (Annex 3). The SAG had reviewed the updated inventory of research which had been presented using the new format agreed in 2010. This new presentation of the information allows for tracking of projects over time and for complete information to be provided on both ongoing and completed projects. The SAG welcomed this new format and the presentation of the summary table in Excel format and recommends that these be used in future, but does not consider that the inventory should be made available for updating via the Board's website as liaison between the Secretariat and the jurisdictions is an important element of the updating process. The Board agreed with these recommendations from the SAG concerning the inventory. It was noted that the inventory is a valuable tool in increasing awareness of research initiatives relating to salmon at sea and their findings, and in promoting cooperation between researchers in different countries. The SAG had been advised there had been no new applications for funding of projects since last year. It was noted that the funding made available by the Board in 2008 for stable isotope studies in Canada had been invaluable in attracting further funds for this work. The SAG had received an interim report from the Board's Working Group on Marine Salmon Survey Data and Sample Collection and recommends that this Group should be asked to complete its work by developing

a meta-database of relevant data sets and sample collections. The SAG further recommends that the Board should ask that the Chairman of the SAG develop a discussion document on possible approaches to improving access to the data and samples and protocols concerning the possible use, particularly destructive use, of samples (see paragraph 5.3 below). The Board agreed to these proposals. The SAG had also received an update on arrangements for the Salmon Summit and recognised the efforts of the Steering Committee in developing the programme for this event and welcomed arrangements to ensure balance between scientific and management aspects in the programme.

5. The SALSEA Programme

(a) Review of progress in implementing SALSEA

- 5.1 Reports were presented on SALSEA North America (Gérald Chaput) including acoustic tracking studies (Dave Meerburg), SALSEA West Greenland (Tim Sheehan), and SALSEA Merge (Ken Whelan). Further details on these projects are contained in the report of the SAG. It was noted that while the three components of the SALSEA Programme were independent projects and had led to major improvements in understanding of the marine life of salmon, there would be benefits from combining and analysing the datasets generated.

(b) Review of progress in promoting SALSEA

- 5.2 The Board noted that the ‘Salmon Summit’ would be a good opportunity to raise awareness of concerns about the mortality of salmon at sea and to promote the work of the Board. The Board was advised that the Atlantic Salmon Trust is seeking funding for the development of an atlas of salmon migrations and distributions, ‘Paths of Silver’, which should be a valuable initiative in disseminating the findings from the SALSEA Merge project. It was suggested that the possibility of including information from the Northwest Atlantic might be explored.

(c) Coordination of SALSEA

- 5.3 Last year, the Board had recognized that recent international initiatives under the SALSEA Programme had generated some extremely valuable databases. These include biological and genetic databases generated under the SALSEA Merge project, and time series of data and historical tagging information compiled by ICES workshops supported by the Board. The Board had recognized that there is a need to ensure that these databases are securely held, maintained and agreed procedures developed to allow access to the data for further research. In addition, the Board had noted the existence of some historical marine survey samples, such as those generated by the international sampling programme at West Greenland, that represent an invaluable resource dating back some 30 years or more and the need to ensure that these samples are being maintained and agreed procedures developed to allow access to them for further research.
- 5.4 The Board had, therefore, established a Working Group to work by correspondence with the Chairman of the Board and to report back to the Board no later than 1 April 2011. The Terms of Reference were contained in document ICR(10)5. The Working

Group's interim report, ICR(11)4 (See Annex 3 of the SAG report) was presented by its Chairman, Professor Whelan. He noted that important datasets and samples had been collected in the past but that the advent of new tools meant that this material was of considerable interest if it could be made accessible to scientists. In summary, the Working Group had recommended that the most important role that the IASRB could play with regard to marine salmon survey data and sample coordination would be to establish a meta-database of existing datasets and sample collections, using the list developed by the Group as a basis (see paragraph 4.1 above). This will be an important step. The Working Group had proposed that it continue its work by developing a format for the meta-database and by providing initial information to populate this database prior to the end of 2011. The Working Group had also recommended that where specific issues arise, requiring the need for support to maintain these datasets and sample collections, the Board may wish to consider if it can offer assistance.

- 5.5 The Board welcomed the progress made by the Working Group and asked that it continue to work by correspondence so as to develop a format for the meta-database and to populate it, in consultation with the jurisdictions, and to report back on progress at the next meeting of the Board. The Board asked that the Chairman of the SAG develop a discussion document on possible approaches to improving access to the data and samples, and protocols concerning the possible use, particularly destructive use, of samples.

(d) The ICES/NASCO Salmon Summit

- 5.6 The Secretary presented a progress report on arrangements for the 2011 NASCO/ICES 'Salmon Summit' entitled 'Salmon at Sea: Scientific Advances and their implications for management' which will be held in L'Aquarium, La Rochelle, France during 11-13 October 2011. The aim is to have a prestigious, well organized and well reported event that will raise awareness of the programmes of research on salmon at sea and their implications for management of the resource. He referred to a further meeting being organised by the Atlantic Salmon Trust in December 2011 in order to disseminate the findings of the SALSEA Merge project. He suggested that further dissemination of the messages from the 'Salmon Summit' would be valuable and NASCO would be glad to assist.

(e) Future actions

- 5.7 The Board discussed its future role. The SALSEA Programme was a major vision that had steered the work of the Board over the last seven years and the 'Salmon Summit' would showcase the recent advances in understanding of the marine life of salmon and the management implications of the research facilitated under the SALSEA Programme. It was recognized that the original SALSEA Programme had also identified factors in fresh water that may affect the survival of salmon at sea and noted that the Board may be able to assist with collaboration and coordination of studies in this area. The Board recognized that it would be important to promote the findings of the SALSEA Programme in the light of the 'Salmon Summit'. In this regard, the Convenor's report from the 'Salmon Summit' could be a very useful tool. It was also recognized that the Board could continue to play an important role in facilitating better coordination of research related to salmon at sea.

6. Finance and administrative issues

- 6.1 The Secretary introduced the 2010 Accounts, ICR(11)2. The accounts indicate a year-end balance of the fund of about £67,000. Presently the Board has around £53,000 available, although £25,000 is needed for the ongoing enhanced sampling programme at West Greenland. The Board agreed that it should retain a balance of £25,000 as its reserve.

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 agreed to hold its next meeting in conjunction with the Twenty-Ninth Annual Meeting of NASCO.
- 9.2 The Chairman thanked participants for their contributions and closed the meeting.

List of Participants

Canada

Brett Norton

European Union

Alan Gray

Ted Potter

Norway

Raoul Bierach

Arne Eggereide

Peder Fiske

Russian Federation

Boris Prischepa

Sergey Prusov

USA

Rory Saunders

Tim Sheehan

NGOs

Paul Knight

Dave Meerburg

Ken Whelan (Chairman)

Secretariat

Peter Hutchinson

Malcolm Windsor

ICR(11)6

Agenda

1. Opening of the Meeting
2. Adoption of the Agenda
3. Election of Officers
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 SALSEA
 - (d) The ICES/NASCO “Salmon Summit” Symposium
 - (e) Future actions
6. Finance and administrative issues
7. Other business
8. Report of the meeting
9. Date and Place of next meeting

SAG(11)4

Report of the Meeting of the Scientific Advisory Group of the International Atlantic Salmon Research Board Hotel Arctic, Ilulissat, Greenland

Friday, 3 June 2011

1. Opening of the meeting

- 1.1 The Chairman, Mr Tim Sheehan (US), opened the meeting and welcomed participants to Ilulissat.
- 1.2 A list of participants is contained in Annex 1.

2. Adoption of the agenda

- 2.1 The SAG adopted its agenda, SAG(11)2 (Annex 2).

3. Review of the updated inventory of research

- 3.1 An overview of the updated inventory of research relating to salmon mortality in the sea, ICR(11)3, was presented. For 2011, 45 on-going and 58 completed projects had been included in the inventory with an annual expenditure of approximately £6.8 million. Six new projects had been included since the 2010 update.
- 3.2 Last year, on the recommendation of its Inventory Review Group (see document SAG(09)10 for details), the SAG had identified two particular issues with the presentation of the inventory. First, it was difficult to track projects over time because the on-going projects listed in the inventory were being renumbered each year and completed projects had no reference numbers. Secondly, only limited information was provided on completed projects, making it difficult to take account of this work in on-going research planning. A possible revised format for the presentation of the inventory, developed by the Secretariat, had been reviewed by the SAG and it was agreed that this should be used in future. Accordingly, following consultations with SAG members, the revised format had been used in presenting the updated 2010 inventory and had again been used in 2011. The SAG had also agreed that it should review the need for additional changes to the inventory at its 2011 meeting, including whether future updating might be undertaken directly by the jurisdictions through the Board's website.
- 3.3 The SAG welcomed the changes that had been made to the presentation of the inventory, which had been a valuable tool in attracting funding at the start of the SALSEA Programme and which presented a concise summary of research projects of relevance to the Board. Given the current economic climate the inventory would be a valuable tool in avoiding duplication of research efforts and prioritizing research. It was noted that there would be additional costs associated with making the inventory

available for updating via the website and possible drawbacks since the present system of liaison between the Secretariat and the jurisdictions in updating the inventory was working well. The SAG therefore recommends to the Board that the inventory should continue to be presented in the revised format (with the summary table available in both Word and Excel formats) and that updating should continue to be done through correspondence between the Secretariat and Board/SAG members.

- 3.4 The SAG reviewed the new projects included in the inventory since the last update in 2010. It was agreed that the Secretariat would seek additional information about project F2 'St Pierre and Miquelon freshwater fish management plan, including a particular program on salmon from Belle Riviere', since this appeared to relate predominantly to the impacts of an in-river hydro-power installation. If this was the case, the project might be removed but the elements relating to the origin of the fish in this river system might be included in project F1 which deals with the St Pierre and Miquelon salmon fishery sampling programme. The SAG noted that this had recommenced in 2010 and included genetic analyses, which was a welcome development.
- 3.5 The SAG agreed that the jurisdictions should be given the opportunity to provide any feedback on the inventory to the Secretariat by the end of June, with a view to the inventory being made available on the Board's website by the end of July.

4. Review of Applications for Potential Funding by the Board

- 4.1 No new applications for funding had been submitted to the Board since the last Annual Meeting. The SAG noted that the Board had previously supported expert participation in a number of relevant Workshops and Study Groups and suggested such support should be considered if a need arose and subject to availability of funds.

5. Progress with Implementing the SALSEA Programme

(a) Report on the SALSEA-Merge Project

- 5.1 Professor Ken Whelan briefly described progress with the SALSEA-Merge project including the establishment of a comprehensive database, SALSEA PGNAPES, developed in order to manage the enormous amount of information emerging from the project. The database had been developed by the Faroe Marine Research Institute and will be held by ICES. A more comprehensive report on the SALSEA-Merge project would be made to the meeting of the Board.

(b) Report on SALSEA North America

- 5.2 Mr Gérald Chaput reported on SALSEA North America. There had been no initiatives in 2009/2010 but the findings from previous studies, including marine surveys, will be presented at the Salmon Summit in La Rochelle.

(c) Report on SALSEA West Greenland

- 5.3 A report on SALSEA West Greenland was presented by Mr Tim Sheehan. In 2009, 412 fish had been purchased from fishermen under the enhanced sampling programme using funds made available by the US and administered by the Board. A further 358 fish had been purchased in 2010. The intention is to continue the sampling in 2011, in order to increase the sample size. Originally, the plan had been to sample a maximum of 900 fish each year for two years. Considering the labour intensive effort required to sample each individual fish, the annual sample sizes were well below the maximum target. A third year of sampling will allow for an increase in the total sample size and greater ability to discern regional trends in differences between the samples. The total sample size will remain well below the maximum target of 1,800 fish. Mr Sheehan also indicated that it will be important to integrate the information from all three elements of SALSEA in the future.

(d) Analysis of historical tagging data

- 5.4 Since 2007, ICES has held three workshops on analysis of historical tagging data. The reports of all three workshops are available on the ICES and IASRB websites. The Board had supported these workshops by funding the participation of a GIS expert and a hydrographer and this had been extremely useful in facilitating the work. Last year, a summary of the final Workshop had been presented to the SAG. The Workshop had recommended that all the tag data used by the Workshops should be compiled into a single database available to Workshop participants and held at the ICES Data Centre and that after a period of two years the data should be made freely available. Furthermore, the reports of the three Workshops will be combined into a single ICES Co-operative Research Report to be published in 2012 and the analyses initiated by the Workshops will be written up in peer-reviewed papers, including some contributions to the 'Salmon Summit' (see paragraph 5.8 below).

(e) Progress on stable isotope analysis of West Greenland samples

- 5.5 The Board had previously agreed to support a study to examine any changes in trophic levels of Atlantic salmon through the marine phase of their life-cycle. Mr Gérald Chaput presented a progress report. The aim is to comprehensively sample salmon at different stages of their life-cycle: smolts migrating out of rivers; post-smolts obtained in SALSEA North America; 1SW and 2SW salmon returning to rivers; and 1SW non-maturing salmon at West Greenland. He indicated that as a result of the initial funding provided by the Board, the project had expanded considerably with the employment of a PhD student. The SAG had previously recognised the importance of this study and it believes that there may be benefits from closer cooperation and coordination of the work on stable isotope analysis in different laboratories; much of the work is being carried out in universities rather than government laboratories. However, the findings from this study and work being carried out at the Universities of Southampton and St Andrews will be presented at the Salmon Summit providing an opportunity for discussions among the scientists involved. It was noted that samples from post-smolts sampled in the SALSEA Merge project were available for analysis.

(e) Reports on sonic telemetry studies

- 5.6 Mr David Meerburg described the findings from acoustic tagging projects being conducted by the Atlantic Salmon Federation in Canada. Information on sonic telemetry studies in eastern Canada, which are a contribution to SALSEA North America, are available online at www.asf.ca. Smolts (40 – 50 fish annually) from the Restigouche, Miramichi, Cascapedia and St Jean rivers were tracked as they moved from their natal rivers and out of the Gulf of St Lawrence using arrays sited at various locations along the migration pathway (including across the Strait of Belle Isle and partially across the Cabot Strait). In addition, kelts were tagged in the Miramichi and Margaree rivers. In 2010, survival increased for all smolt groups migrating through the Gulf of St Lawrence; in the case of the Cascapedia, there was very low mortality from the estuary to leaving the Gulf. It was noted that the smolt migrations coincided with kelt movements and it had been suggested that smolts might be following the migration routes of the kelts. It had also been noted that the smolts were not migrating with the predominant surface current. The SAG had previously recognised the importance of these tagging studies which have estimated levels of mortality in three different parts of the early phase of migration for several salmon stocks and explored hypotheses concerning the speed of migration and the benefits of shoaling on mortality. Dr Fred Whoriskey has been invited to present the findings from this research at the ‘Salmon Summit’. It was noted that there are ongoing acoustic tracking projects in Denmark and Norway (Salmotrack project) in the North-East Atlantic Commission area. Details are contained in the inventory of research.

(f) Coordination of the SALSEA Programme

- 5.7 Last year, the Board had recognized that recent international initiatives under the SALSEA Programme had generated some extremely valuable databases. These include biological and genetic databases generated under the SALSEA Merge project, and time series of data and historical tagging information compiled by ICES workshops supported by the Board. The Board had recognized that there is a need to ensure that these databases are securely held, maintained and agreed procedures developed to allow access to the data for further research. In addition, the Board had noted the existence of some historical marine survey samples, such as those generated by the international sampling programme at West Greenland, that represent an invaluable resource dating back some 30 years or more. The need to ensure that these samples are being maintained and agreed procedures developed to allow access to them for further research was recognised.
- 5.8 The Board had, therefore, established a Working Group to work by correspondence with the Chairman of the Board and to report back to the Board no later than 1 April 2011. The Terms of Reference for this Working Group are contained in document ICR(10)5. The Working Group’s interim report, ICR(11)4 (Annex 3) was presented by its Chairman, Professor Ken Whelan. In summary, the Working Group had recommended that the most important role that the IASRB could play with regard to marine salmon survey data and sample coordination would be to establish a meta-database of existing datasets and sample collections, using the list developed by the Group as a basis. This will be an important step and the Working Group had indicated its willingness to continue its work by developing, prior to the end of 2011, a format for the meta-database and by providing initial information to populate this database. The Working Group had also recommended that where specific issues

arise, requiring the need for support to maintain these datasets and sample collections, the Board may wish to consider if it can offer assistance. The SAG supported these proposals and recommends that the Board ask the Working Group to complete this work by the end of the year so that the meta-database could be made available to the jurisdictions for checking at the same time as the inventory update.

- 5.9 The SAG discussed issues that had arisen concerning access to the databases and sample collections from the West Greenland fishery. It was noted that considerable resources had been committed to the sampling programme by a number of jurisdictions over a considerable period of time, including under NASCO's West Greenland Sampling Agreements, but that access to the data was not always readily available to the countries concerned. It was agreed that the SAG should recommend to the Board that the Chairman of the SAG develop a discussion document on possible approaches to improving access to and usability of the data, access to samples and protocols concerning their possible use, particularly destructive use.

(g) 2011 Symposium

- 5.10 The Assistant Secretary presented a progress report on arrangements for the 2011 NASCO/ICES 'Salmon Summit' entitled 'Salmon at Sea: Scientific Advances and their implications for management' which will be held in L'Aquarium, La Rochelle, France during 11-13 October 2011. The TOTAL Foundation has agreed to sponsor the symposium and funds have also been contributed by the IASRB and ICES. To date, approximately 100 delegates have registered and there is a maximum capacity of 130 participants. The Steering Committee has developed the Programme for the symposium and there will be 18 invited, 18 contributed and 20 poster papers in the following sessions: scene setting overviews; the distribution and migration of salmon at sea; food production, growth of salmon and trophic and other interactions; implications for salmon management and future research needs; and synthesis. While the focus is on the situation facing salmon in the North Atlantic, there will also be presentations from the Pacific and Baltic areas. In addition to allowing for presentation of the results of recent scientific research, the Steering Committee has gone to great lengths to ensure that there will be thorough consideration of the management implications and applications of the research findings. In particular, there will be a session devoted to the management aspects, including invited and contributed presentations, 'Take Home' messages and a discussion period devoted to the management implications. All authors have been advised that they should highlight any implications for management in presenting their scientific findings. The proceedings of the symposium will be published in the ICES Journal of Marine Science but, additionally, there will be a separate report by the Convenors dealing only with the management implications arising from the information presented. The aim is to have a prestigious, well organized and well reported event that will raise awareness of the programmes of research on salmon at sea and its implications for management of the resource. The SAG recognized the importance of this event and the efforts of the Steering Group in ensuring balance between the scientific and management aspects. It was noted that the Atlantic Salmon Trust is also holding a one day meeting in December 2011 in London to further disseminate the findings from SALSEA Merge to managers.

(h) Other activities

- 5.11 Reference was made to the Atlantic Salmon Trust's intention to develop an atlas of salmon migrations ('Paths of Silver') and sponsors are currently being sought.
- 5.12 It was noted that EIFAAC was seeking feedback from NASCO on the role it could play in relation to improvements to fish passage in rivers. It was suggested that this issue be raised by EIFAAC in its Opening Statement to the Council.

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 agreed to hold its next meeting in conjunction with the Twenty-Ninth Annual Meeting of NASCO.
- 8.2 In closing the meeting the Chairman thanked the participants for their contributions.

List of Participants

Canada

Gérald Chaput
Richard Nadeau

European Union

Cathal Gallagher
Paddy Gargan
Alan Gray
Ted Potter
Jonathan White

Norway

Peder Fiske

Russian Federation

Sergey Prusov

USA

Tim Sheehan (Chairman)

NGOs

Paul Knight
Dave Meerburg
Ken Whelan

Secretariat

Peter Hutchinson

SAG(11)2

Agenda

1. Opening of the meeting
2. Adoption of the agenda
3. Review of the updated inventory of research
4. Review of applications for potential funding by the Board
5. Progress with Implementing the SALSEA Programme
 - (a) Report on the SALSEA-Merge project
 - (b) Report on SALSEA North America
 - (c) Report on SALSEA West Greenland
 - (d) Analysis of historical tagging data
 - (e) Progress on stable isotope analysis of West Greenland samples
 - (f) Reports on sonic telemetry studies
 - (g) Coordination of the SALSEA Programme
 - (h) 2011 Symposium
 - (i) Other activities
6. Other business
7. Report of the meeting
8. Date and place of next meeting

ICR(11)4

***Interim Report of the IASRB Working Group
on Marine Salmon Survey Data and Sample Collection***

Introduction

1. At its 2010 meeting, the International Atlantic Salmon Research Board (IASRB) noted that some extremely valuable databases had been generated as a result of SALSEA-Merge and other recent initiatives such as the ICES Study Group on Biological Characteristics as Predictors of Salmon Abundance (SGBICEPS) and the ICES workshops on analysis of historical tag recovery data from oceanic areas. Both of these ICES initiatives were supported by the IASRB. In addition to these electronic datasets, there are sample collections, including scales and genetic samples from the international sampling programme at West Greenland for more than 30 years, which could be enormously valuable if accessible to researchers. These samples, for example, may have considerable potential given the development of new analytical techniques such as the genetic tools developed in recent years. The IASRB had agreed that it needed further guidance on issues such as how to securely store both electronic data and samples, accessibility of the material and the cost implications of different arrangements. It decided, therefore, to establish a Working Group comprising two representatives each from Europe and North America and one from the Russian Federation to consider these matters and make recommendations.

Terms of Reference

2. The Terms of Reference for the Working Group are contained in ICR(10)5 and are as follows:
 - Compile a listing of available databases of relevance to the SALSEA Programme including a description of these data, the size of the database and the current location and agency/individual scientist responsible for their maintenance and storage;
 - If necessary, advise on appropriate arrangements for securely maintaining these databases and for updating the data if required, including appropriate quality control procedures;
 - Develop an agreed procedure with the owners/holders of the data regarding access to the information;
 - Compile a listing of samples resulting from the international cooperative programmes held by NASCO Parties or jurisdictions both current and archival including a description of the nature and size of the samples, their storage and current locations and agency/individual scientist responsible for their maintenance and storage;
 - Advise on options to ensure that these samples are safely maintained for future use;
 - Develop an agreed procedure with the owners/holders of these samples regarding access to the information;
 - Advise on the possible roles for the Board in assisting with the maintenance, storage and updating of databases (including seeking advice from ICES) and for maintaining these biological samples;

- Advise on approaches that might be adopted by the Board to encourage enhanced cooperation with regard to sharing of long time series of data being held nationally but which might support the work of the Board.

Composition and Working Methods

3. The Working Group comprised Mr Ted Potter (EU), Ms Marianne Holm and Dr Vidar Wennevik (Norway), Mr Tim Sheehan (USA) and Dr Sergey Prusov (Russian Federation) and was chaired by Dr Ken Whelan. The NASCO Assistant Secretary supported the work of the Group. The Group worked by correspondence and several members of the Group met briefly immediately after the meeting of the ICES Working Group on North Atlantic Salmon. This is an interim report and the Group is willing to continue its work if the IASRB agrees with its recommendations for taking forward this important initiative.

Progress to Date

4. The Working Group has made initial progress and its responses to each of its Terms of Reference are detailed below. The ToRs relating to compilation of a listing, secure maintenance and accessibility are repeated for both datasets and sample collections. In the interests of brevity, however, the responses are combined under the ToRs relating to datasets and not repeated for the ToRs relating to samples.

Compile a listing of available databases of relevance to the SALSEA Programme including a description of these data, the size of the database and the current location and agency/individual scientist responsible for their maintenance and storage.

5. The Working Group identified the following preliminary list of relevant datasets that relate to the marine phase of salmon and are, therefore, of relevance to the SALSEA Programme:
 - SALSEA-Merge
 - SALSEA North America
 - SALSEA Greenland
 - Faroes fishery sampling
 - Greenland fishery sampling
 - Various homewater coastal studies (e.g. Ireland, Norway, UK)
 - ICES historical tagging database
 - SGBICEPS
 - Genetic baseline databases
6. The Working Group recognises that most of these datasets include samples (scale samples as a minimum) as well as data. Some of the datasets and sample collections have been derived from collaborative international programmes while others are predominantly the result of initiatives by a single country or agency.
7. The Working Group concluded that it would be valuable for the IASRB to develop a meta-database detailing *inter alia* what data and samples exist, whether they were derived from international collaborative programmes or national research, where they are

held, the person responsible for them, and their accessibility to researchers. This meta-database could be held by the IASRB and might be made available on the IASRB website, if funds permit. The Working Group is willing to further refine this listing, to develop a database format for holding this information and to populate the database if the IASRB agrees to the establishment of such a meta-database. The existence of this meta-database would serve to highlight the value of the datasets and sample collections and hopefully minimise the risk of them being disposed of without prior warning. The information developed by the Working Group could then be validated by IASRB members before it is made publicly available. The Group believes that there might be other datasets and sample collections (particularly scale samples) held in national laboratories which would have relevance to the SALSEA Programme and which might also be included in the meta-database, in due course. Details of these datasets and sample collections might be sought through a request to Board members, perhaps in conjunction with the annual request for the updating of the inventory.

If necessary, advise on appropriate arrangements for securely maintaining these databases and for updating the data if required, including appropriate quality control procedures.

8. The Working Group considers that this is not a matter for the IASRB as the individual datasets and sample collections are believed to be managed appropriately by the individual or agency responsible. However, this would need to be checked with the 'owners' on a case by case basis, in order to identify any issues of which the Group may be unaware. While there may be risks, and costs, associated with holding datasets and sample collections in one location, the current locations had generally been chosen for a good reason (e.g. location of specific expertise or laboratory facilities). However, the Working Group believes that this issue might need to be re-visited with involved parties when specific experts retire or take-up different responsibilities or if costs become a problem. Where there are proposals to dispose of sample collections, these might first be offered to other laboratories and a mechanism to facilitate this might be included in the meta-database.
9. The Working Group does not believe that the Board can play any significant role in maintaining or updating the datasets and sample collections other than establishing and updating the meta-database that will highlight their existence and accessibility. This in itself is a valuable step forward in raising awareness of the existence of the information, providing information concerning its accessibility and highlighting its significance to the international community. Reports could be made to the IASRB on the status of the datasets and sample collections included in the meta-database and the IASRB, through its Scientific Advisory Group (SAG), might advise how this information may support new research initiatives that are notified to the IASRB.

Develop an agreed procedure with the owners/holders of the data regarding access to the information

10. The Working Group notes that there are a number of different types of data in the list shown in paragraph 5 above. The tagging data is quite old and there should be relatively little sensitivity about releasing these data more widely. Many of the SGBICEPS data time series are, however, part of on-going programmes and the project managers may be less willing to release them. Many of the older datasets and sample collections were also

collected as part of national programmes and there may be considerable sensitivity about access to them. The Working Group concluded, therefore, that it may not be possible to develop generic guidance concerning access to the datasets and sample collections, but those responsible for the national datasets should be consulted with regard to whether, and if so how, the data may be accessed, and this information should be included in the meta-database. With regard to datasets and sample collections derived through international programmes, the Working Group believes that these may have additional significance and provide new insights into the marine phase of salmon given the development of new analytical tools. This might be particularly so for the material derived from the West Greenland fishery sampling programme, conducted for many years under agreements developed by the West Greenland Commission. The Working Group has not developed procedures concerning access to these datasets and sample collections but believes this issue should be considered further by the Board. It may be, for example, that the Board would wish to be advised of any requests for access to these datasets and sample collections in the future, particularly where destructive analysis (e.g. of scales) is proposed.

11. The Working Group also discussed the disposition of datasets and sample collections from shorter-term international programmes such as SALSEA. Some funding agencies may require the datasets to be made publicly available after a suitable period of time, although it was noted that under European Commission funded projects it is possible to 'ring fence', at the start of the project, existing datasets that will be analysed as part of the research. Furthermore, it may not be appropriate for laboratories to charge for access to datasets and sample collections when they have been collected under funding from another agency such as the European Commission. The Working Group believes that the project teams responsible for international datasets and sample collections (e.g. SALSEA) should agree protocols for storing and making datasets accessible following completion of the project, in agreement with the funders. This information should also be included in the meta-database. Where national data are compiled into international databases (e.g. tagging data) any restrictions on access to the data should be included within the documentation (e.g. with data held by the ICES data centre).
12. The Working Group noted that several datasets and sample collections are not well documented and this might be one of the greatest restrictions on making them accessible to other researchers. The Working Group concluded, therefore, that efforts should be made to ensure that all relevant national and international datasets and sample collections are fully documented and included in the meta-database. Again, this might be achieved through a request from the IASRB to the members of the Board.

Compile a listing of samples resulting from the international cooperative programmes held by NASCO Parties or jurisdictions both current and archival including a description of the nature and size of the samples, their storage and current locations and agency/individual scientist responsible for their maintenance and storage

13. See paragraphs 5 - 7 above.

Advise on options to ensure that these samples are safely maintained for future use.

14. See paragraphs 8 - 9 above.

Develop an agreed procedure with the owners/holders of these samples regarding access to the information

15. See paragraphs 10 - 12 above.

Advise on the possible roles for the Board in assisting with the maintenance, storage and updating of databases (including seeking advice from ICES) and for maintaining these biological samples

16. The Working Group does not believe that the IASRB can play any significant role in maintaining, storing or updating the databases or maintaining samples other than in establishing and maintaining the meta-database. This in itself is a valuable step forward in raising awareness of the existence of the information, providing information concerning its accessibility and highlighting its significance to the international community. The Board could also play a role in seeking from the Parties updated and additional information through an annual report linked to the return of information on the inventory of research related to mortality of salmon at sea.
17. The Working Group notes that there may be issues going forward regarding the costs of maintaining the datasets and samples and, given the international significance of some of this information and material the Board may wish to consider if it can offer assistance, if a need arises and if funds permit. Some assistance may also be appropriate in the form of support to allow compilation of datasets/samples, to modernise the databases, where appropriate, and in establishing inventories of samples where these are lacking. The Working Group recommends that these matters be given further consideration in future, if any issues arise.

Advise on approaches that might be adopted by the Board to encourage enhanced cooperation with regard to sharing of long time series of data being held nationally but which might support the work of the Board

18. The Working Group notes that recent ICES Study Groups and workshops have been successful in identifying, compiling and analysing multiple datasets and that the Board has supported expert participation in these initiatives. The Working group believes that the Board should consider continuing to support such initiatives, as funds permit, if further relevant study groups or workshops are established in future. The Working Group notes that attendance at these Study Groups and workshops has been constrained by availability of funds, and that even with IASRB assistance, this had somewhat restricted the progress made.

‘Next Steps’

19. The Working Group believes that the most important role that the IASRB can play with regard to marine salmon survey data and sample coordination is to establish a meta-database of existing datasets and sample collections, using the list developed by the Group as a basis. This will be an important step and if the Board agrees, the Working Group is willing to continue its work by developing, prior to the end of 2011, a format for the meta-database and by providing initial information to populate this database. The Group believes that where specific issues arise requiring the need for support to maintain

these datasets and sample collections the Board may wish to consider if it can offer assistance.

Ken Whelan
IASRB Chairman

CNL(11)10

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 2011¹;
- 1.2 report on significant new or emerging threats to, or opportunities for, salmon conservation and management²;
- 1.3 provide a review of examples of successes and failures in wild salmon restoration and rehabilitation and develop a classification of activities which could be recommended under various conditions or threats to the persistence of populations;
- 1.4 provide a compilation of tag releases by country in 2011;
- 1.5 identify relevant data deficiencies, monitoring needs and research requirements.

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

- 2.1 describe the key events of the 2011 fisheries³;
- 2.2 review and report on the development of age-specific stock conservation limits;
- 2.3 describe the status of the stocks;
- 2.4 provide catch options or alternative management advice for 2012-2015, with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding⁴;
- 2.5 further develop a risk-based framework for the provision of catch advice for the Faroese salmon fishery, providing a clear indication of the management decisions required for implementation;
- 2.6 further develop a framework of indicators that could be used to identify any significant change in the assessments used in previously provided multi-annual management advice;
- 2.7 provide advice on best practice for conducting monitoring surveys for the parasite *Gyrodactylus salaris*.

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

- 3.1 describe the key events of the 2011 fisheries (including the fishery at St Pierre and Miquelon)³;
- 3.2 update age-specific stock conservation limits based on new information as available;
- 3.3 describe the status of the stocks;
- 3.4 provide catch options or alternative management advice for 2012-2015 with an assessment of risks relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding⁴.

4. With respect to Atlantic salmon in the West Greenland Commission area:

- 4.1 describe the key events of the 2011 fisheries³;
- 4.2 describe the status of the stocks⁵;
- 4.3 provide catch options or alternative management advice for 2012-2014 with an assessment of risk relative to the objective of exceeding stock conservation limits and advise on the implications of these options for stock rebuilding⁴;
- 4.4 update the framework of indicators used to identify any significant change in the previously provided multi-annual management advice;
- 4.5 advise on possible explanations for the variations in fishing patterns (e.g. effort, licenses and landings) observed in the Greenland fishery in recent years.

Notes:

- 1. *With regard to question 1.1, 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. Numbers of salmon caught and released in recreational fisheries should be provided.*
- 2. *With regard to question 1.2, ICES is requested to include reports on any significant advances in understanding of the biology of Atlantic salmon that is pertinent to NASCO, including information on any new research into the migration and distribution of salmon at sea and the potential implications of climate change for salmon management.*
- 3. *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, 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.*
- 4. *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 and report on any developments in relation to incorporating environmental variables in these models.*
- 5. *In response to question 4.2, 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 2.3 and 3.3.*

CNL(11)11

***Final Report of the Aquaculture, Introductions and Transfers and Transgenics
Focus Area Review Group***

1. The third and final focus area in the first cycle of reporting under the Implementation Plans is Aquaculture, Introductions and Transfers and Transgenics. The Review Group's draft report had been presented to the Council last year, CNL(10)12, following its earlier review by the NASCO/ISFA Liaison Group. It had not been necessary for the Review Group to develop recommendations on best practice because in 2009 a Task Force established by the Liaison Group had developed 'Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks', SLG(09)5.
2. In finalising its report, the Review Group was asked to take into account the comments on its draft report from the Parties, ISFA, and the NGOs and those made during the Special Session. The Review Group was also asked to review a new FAR that had been submitted by EU-Ireland and the relevant sections of a document provided by EU-Spain.
3. The final report is attached. It was considered by the Liaison Group at its meeting during 18-19 March 2011 (see CNL(11)14), which made the following comments:
 - The Liaison Group thanks the Review Group for its report, complete with its eight annexes, and encourages NASCO's Parties to make full use of the wealth of information provided;
 - Going forward, NASCO Parties should carefully consider the following in its 'Next Steps' process:
 - the extent of NASCO's role with respect to aquaculture, introductions and transfers and transgenics;
 - the roles and responsibilities of the Parties, industry and NGOs with respect to NASCO's role;
 - activities and studies that would best serve NASCO's role going forward.
4. This response was considered by the 'Next Steps' Review Group and its report is contained in document CNL(11)12. The Council is asked to consider the final report of the aquaculture FAR Review Group and decide on any action needed in the light of this report, and the recommendations from the Liaison Group and from the 'Next Steps' Review Group.

Secretary
Edinburgh
7 April 2011

Report of the Meeting of the Ad Hoc Review Group on Aquaculture, Introductions and Transfers and Transgenics

1. Opening of the Meetings by the Coordinator

- 1.1 At the Review Group's first meeting, held in Washington DC from 22 – 25 February 2010, the Coordinator, Dr Malcolm Windsor, indicated that the task before the Group was to review the measures taken by the jurisdictions to protect the wild salmon stocks from the impacts of aquaculture, introductions and transfers and transgenics in order to assess their consistency with NASCO's agreements. He stressed that this is the first time that NASCO had attempted such a review of aquaculture and related activities and the outcome will set the scene for the future. He noted that there are serious concerns about the impacts of salmon aquaculture, introductions and transfers and transgenics. NASCO has gone to great lengths to ensure that it has the best available scientific advice on the threats to the wild stocks from these activities. It is clear from the findings of the 2005 Bergen Symposium that while the salmon farming industry has made progress, real concerns remain about the impacts of escapees and sea lice on the wild stocks, in part linked to continuing growth of the industry. However, he stressed that poorly planned introductions and transfers, including stocking practices, can also have impacts on the wild stocks. He noted that in carrying out its reviews, the Group should have only one question in its mind – 'Do the steps in the FARs fully comply with NASCO's agreements to protect the wild stocks from genetic, disease, parasite and other impacts?' While neither he nor the Assistant Secretary would be reviewers the Secretariat would support the work of the Review Group. The members of the Review Group were specifically not representing their Party or Organization but the interests of the wild Atlantic salmon. While the Group did not need to produce unanimously agreed assessments he indicated that it may be more powerful if it could.
- 1.2 At the Group's second meeting, held in Boston from 22 – 23 November 2010, the Coordinator indicated that the Group's Draft Report had been presented at the meeting of the ISFA/NASCO Liaison Group in April 2010 and then to the Council during a Special Session at its Annual Meeting in Quebec City in June 2010. Comments on this draft report had been received from ISFA and NASCO's accredited NGOs had responded to these comments. Feedback on the draft report had also been received during the Special Session in 2010. He indicated that the Council had agreed that the Parties should be given until 31 October 2010 to provide comments on the draft report and these had been received from Canada, Faroe Islands, Norway, UK – Scotland and the USA. In finalising its report, the Group had been asked to take into account the comments on its draft report from the Parties, ISFA and the NGOs during the Special Session and to review two new documents made available since the Group's first meeting. The task for the Review Group at its second meeting was, therefore, to consider an appropriate way to handle the feedback on its draft report, to review the two new documents (for Ireland and Spain) and to develop an overview of approaches and challenges in accordance with its Terms of Reference.

- 1.3 The members of the Review Group who participated in the meetings were: Torfinn Evensen, Heidi Hansen, Tim Sheehan, Bob Steinbock and Boyce Thorne Miller (second meeting by correspondence only). Ms Marita Rasmussen contributed to the work of the Review Group by correspondence. Brief biographies of the members of the Review Group are contained in Annex 1.

2. **Adoption of the Agenda**

- 2.1 The Group adopted the agendas for both of its meetings, IP(10)20 and IP(10)35.

3. **Review of the Terms of Reference and consideration of working methods**

- 3.1 The Group reviewed its Terms of Reference and agreed on its working methods. These were described fully in the Review Group's draft report, CNL(10)12, and are contained in Annex 2 together with other procedural information.
- 3.2 In finalising its report, the Group had been asked to take into account the comments on its draft report from the Parties, ISFA and the NGOs including those made during the Special Session and to review new documents made available since the first meeting for Ireland and Spain. The Review Group was asked to make its final report available to the Liaison Group in March 2011 and it would then be considered by the Council of NASCO at its Twenty-Eighth Annual Meeting.
- 3.3 The Review Group noted that the terms 'salmon farming' and 'salmon aquaculture' are sometimes used synonymously. Throughout this report and in its assessments the Review Group has used the terms as defined in the Williamsburg Resolution as follows:

Salmon aquaculture: The culture or husbandry of Atlantic salmon, including salmon farming, salmon ranching and salmon enhancement activities.

Salmon enhancement: The augmentation of wild stocks in individual river systems by the release of Atlantic salmon at different stages in their life-cycles.

Salmon farming: Production system which involves the rearing of Atlantic salmon in captivity for the duration of their life-cycle until harvested.

Salmon ranching: The release of reared Atlantic salmon smolts with the intention of harvesting all that return.

4. **Consideration of the Guidance on Best Practice**

- 4.1 At the Group's first meeting, the Assistant Secretary presented an overview of NASCO's agreements on aquaculture and related activities and the background to the development of the BMP Guidance, SLG(09)5, that had been adopted by both ISFA and NASCO in 2009. The basic principle of this guidance is that salmon stocks in areas with salmon farming should be in as healthy a state as those in areas without salmon farming. The international goal for sea lice is '100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms'. The international goal for containment is '100% farmed fish to be retained in all production facilities'. The Task Force had subsequently developed an explanation of the terms used in the BMP Guidance and considered the possible development of a Decision Tree to assist

jurisdictions in understanding the application of the BMP Guidance. The Task Force had also considered other issues such as the use of sterile salmon in farming and the consequences of hybridization between farmed and wild salmon. The Task Force had noted that while the Williamsburg Resolution remains valid it needed to be strengthened in its interpretation and application, particularly in terms of defined goals and assessment of outcomes. The BMP Guidance was intended to assist the NASCO Parties and jurisdictions in framing the management of salmon aquaculture, in cooperation with their industries, in developing future NASCO Implementation Plans and in preparing their Focus Area Reports for the 2010 review and subsequently. To this end, the BMP Guidance had, at the request of the Council, been incorporated into the guidance on preparing the aquaculture Focus Area Reports (see document CNL40.970).

The international goal for sea lice is ‘100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms’. The international goal for containment is ‘100% farmed fish to be retained in all production facilities’.

- 4.2 The Review Group recognised that while its TORs included compiling best practice, this work had been completed by the ISFA/NASCO Task Force. The Review Group welcomed this BMP Guidance and the development of more quantitative international goals and the recommendations for reporting and tracking which include monitoring of: lice loads on wild salmonids in areas with and without farms; lice-induced mortality of wild salmonids; and the efficacy of lice treatments. For containment, the reporting and tracking focuses not only on information on the level and causes of escapes from farms but the incidence of farmed salmon in the wild.

The Review Group welcomed this BMP Guidance and the development of more quantitative international goals and the recommendations for reporting and tracking.

- 4.3 The Review Group notes with concern information presented in the FARs that indicates increased lice abundance on farmed salmon in some jurisdictions in 2009 and the detection of resistance to both Emamectin benzoate (SLICE[®]) and pyrethroids. This development may jeopardise the ability to achieve the international goal for sea lice. The Review Group notes that there is no reference to the use of sterile salmon under the best management practices and suggests that this issue be given further consideration by NASCO and the Liaison Group. The recognition of the value of marking to determine the origin of escaped farmed salmon is welcome (see paragraph 5.27 below). The Review Group also believes that development of Decision Trees relating to sea lice control and containment, as discussed by the Task Force, could be a useful tool in assisting jurisdictions in applying the BMP Guidance.
- 4.4 The Review Group recognised that while the BMP Guidance was only agreed in 2009, NASCO’s agreements relating to aquaculture, introductions and transfers and transgenics date from the early 1990s and many elements were subsequently included in the Williamsburg Resolution together with the Liaison Group’s 2001 Guidelines on

Containment of Farm Salmon. The BMP Guidance was developed to assist in strengthening the application and interpretation of the Williamsburg Resolution. The Review Group, therefore, felt that all jurisdictions with salmon farming should be able to demonstrate clear progress towards achieving the international goals but in most cases data to demonstrate progress was not provided.

5. **Review and analysis of FARs and identification of additional actions to ensure consistency with NASCO agreements relating to aquaculture, introductions and transfers and transgenics**

Jurisdictions not submitting a FAR

- 5.1 Before presenting its recommendations arising from the reviews of the FARs, the Group wishes to note that three jurisdictions (Greenland, EU-Portugal, and EU-Spain) have not presented FARs. In the case of Greenland, the lack of an aquaculture and related activities FAR is to be expected as it does not have any of these activities. The Implementation Plan for Greenland states that there are 'no marine salmon aquaculture facilities in Greenland and, therefore, there are no environmentally threatening factors associated with this form of production originating from Greenland that could be detrimental to the stocks at West Greenland. The international sampling programme checks salmon for fish diseases, in particular the virus ISAv, of which all samples, as of now, have been negative'. There is only one small salmon river in Greenland and no stocking occurs. FARs were, however, expected for EU (Portugal and Spain) and the Review Group reiterates the views of previous Review Groups that if there is to be a complete assessment of whether the management actions being taken around the North Atlantic are in accordance with NASCO's agreements the Council needs to have information from all jurisdictions. A document entitled 'Information for the Compilation of a NASCO Implementation Plan and NASCO Focus Area Reports for Spain', CNL(10)36 was provided by Spain. The latter document was not a FAR but the Group did review the document and offers comments on it in paragraphs 5.4 – 5.6 below.

EU – Portugal

- 5.2 The Group noted the following specific points in relation to minimising impacts of aquaculture and related activities in EU – Portugal:

The Group is aware of the very small wild salmon stocks and their tenuous state in Portugal which, however, being at the southern limit of the range, are very important for genetic diversity. While the Group is unaware of any salmon farming in Portugal it is aware that hatchery programmes have been conducted in support of stock rebuilding efforts.

- 5.3 The Review Group recommends that the Council urges Portugal to contribute to this important aspect of NASCO's work at the earliest opportunity.

EU – Spain

- 5.4 The Group reviewed a document made available at NASCO's 2010 Annual Meeting entitled 'Information for the Compilation of a NASCO Implementation Plan and NASCO Focus Area Reports for Spain', CNL(10)36. This document provides information for the Autonomous Regions in Spain with salmon rivers and includes brief descriptions of: the objectives of the salmon management strategy and the entities involved; the nature and extent of the resource; the measures in place for the management of salmon fisheries, for the protection and restoration of salmon habitat and to minimise impacts of aquaculture and related activities; and the on-going monitoring activities. However, the Group notes that information is lacking for some of the Autonomous Regions and little detail of the management measures is provided for those where information has been presented, so further input will be required before an Implementation Plan and FARs can be developed.
- 5.5 This is particularly the case for the sections of the document dealing with aquaculture and related activities. The document indicates that there has been no commercial salmon farming other than in Galicia, where production ceased 15 years ago. However, it is stated that a new Norwegian project has started in the Arosa Ria but no information is provided on the scale of the venture or the measures being applied to protect the wild stocks from adverse impacts. There is also some rainbow trout farming and stocking is carried out in several of the Autonomous Regions. Some information is provided on the hatchery programmes and it appears that the source of the material for these programmes is adult salmon returning to the rivers. For Asturias, it is stated that fish health and genetic screening are undertaken. Some information is also presented on monitoring programmes although these appear to be related mainly to monitoring of stock status.
- 5.6 Given the very limited information provided relating to aquaculture, introductions and transfers and transgenics and the fact that this document represents a first step in developing an Implementation Plan and FARs, the Group concluded that it was not appropriate to assess the document against the detailed criteria developed for evaluating the aquaculture and related activities FARs. However, the Group welcomes the progress made towards meeting NASCO's reporting requirements and encourages Spain to complete this process before the next reporting cycle commences.

Jurisdictions submitting a FAR

- 5.7 The Review Group welcomed the submission of the following fourteen FARs which it reviewed:
- Canada, IP(10)16;
 - Denmark in respect of the Faroe Islands, IP(10)14;
 - EU – Denmark, IP(10)11;
 - EU – Finland, IP(10)5;
 - EU – France, IP(10)9;
 - EU – Germany, IP(10)6;
 - EU – Ireland, IP(10)23;
 - EU – Sweden, IP(10)8;

- EU – UK (England and Wales), IP(10)3;
 - EU – UK (Northern Ireland), IP(10)10;
 - EU – UK (Scotland), IP(10)15;
 - Norway, IP(10)13;
 - Russian Federation, IP(10)4;
 - USA, IP(10)7.
- 5.8 While the Council had asked that the FARs be made available for review no later than 31 December 2009, only five jurisdictions were able to meet this deadline. Many of the FARs, including some of the longer documents, were not received until early or mid-February 2010 leaving limited time for the review (and one FAR was not received until May after the Group's first meeting). As noted by previous Review Groups the review process will only work effectively if the timetable set by the Council is adhered to.

General comments on the FARs

Structure and content

- 5.9 The earliest NASCO agreements were developed almost twenty years ago. The Williamsburg Resolution, to minimise adverse impacts on the wild salmon stocks from aquaculture, introductions and transfers and transgenics, was adopted by NASCO in 2003 (and amended in 2004 and 2006). It consolidated NASCO's previous agreements into one Resolution and incorporated elements intended to ensure consistency with the Precautionary Approach (e.g. burden of proof, corrective measures, risk assessments). The Williamsburg Resolution provides guidance to NASCO's jurisdictions on a diverse array of aquaculture activities including salmon farming, ranching and stocking that is conducted for a variety of purposes. There is variety in the type and magnitude of aquaculture related activities in which NASCO's jurisdictions are engaged. In some jurisdictions, the salmon populations are dependent on stocking programmes while in others there may be no stocking of salmon at all. Some jurisdictions have an enormous production of farmed Atlantic salmon whereas other jurisdictions have none. The size and status of the wild salmon populations across the jurisdictions also varies with some jurisdictions working to restore extinct populations or to prevent the extinctions of populations (including those designated to receive special government protection) whereas others have populations that still support significant, albeit reduced, recreational and commercial fisheries. In carrying out its work, the Review Group assessed each activity against the relevant guidance in the Williamsburg Resolution and, in the case of salmon farming, the BMP Guidance which was developed to strengthen the interpretation and application of the Williamsburg Resolution in relation to sea lice and containment.
- 5.10 The Group noted that some jurisdictions (Canada, EU – Finland, EU – France, EU – Ireland, EU – UK (England and Wales), EU – UK (Northern Ireland), EU – UK (Scotland), Norway, USA) had adhered to the guidance from the Council on the structure of their FARs. This had facilitated the Review Group's work and the Group urges all jurisdictions to adhere to the agreed format in future reporting. The Group also recommends that the Council considers providing further guidance to the jurisdictions concerning the amount of detail to be included in the FARs. It had previously been suggested that a limit of no more than 20 pages be applied with the

option to provide more detailed information in annexes. While many FARs had kept to this guidance some FARs contained an enormous amount of detailed information in the annexes which was impossible for the Group to review. In future, where a jurisdiction wishes to provide supplementary information in annexes it would assist the reviewers if this could be summarised because there is very limited time to conduct the reviews. Some FARs presented a large amount of information describing the activities, policies and management structures in place rather than focusing on the outcomes of measures taken to implement the Williamsburg Resolution and to demonstrate progress towards achieving the international goals to safeguard the wild stocks. Conversely, several of the FARs comprised only the briefest of overviews that made it difficult to fully understand and, therefore, assess the measures in place.

It would be desirable that future FARs focus on outcomes and progress towards achieving the international goals so as to properly demonstrate whether or not salmon stocks in areas with salmon farming are in as healthy a state as those in areas without salmon farming.

- 5.11 Some of the FARs lacked transparency with regard to the nature of the challenges that exist in minimising impacts on the wild stocks from aquaculture and stated their own judgements about consistency of the measures in place with NASCO's agreements. It would be desirable that future FARs focus on outcomes and progress towards achieving the international goals so as to properly demonstrate whether or not salmon stocks in areas with salmon farming are in as healthy a state as those in areas without salmon farming. Some FARs referred to duplication in the reporting format. This was, perhaps, inevitable given the inclusion of the BMP Guidance elements in an existing reporting format. However, it should be noted that there were some elements that few or none of the FARs provided any information on. The comments below apply to many of the FARs reviewed so, rather than repeat them in each assessment, the Review Group has described them in paragraphs 5.12 – 5.23 below.

Action Plans on Containment

- 5.12 Under the Guidelines on Containment of Farm Salmon (Annex 3 of the Williamsburg Resolution) each jurisdiction should draw up a national action plan, or regional plans. The action plan is described as the process through which internationally agreed guidelines on containment would be implemented at the national or regional level through existing or new voluntary codes of practice, regulations, or a combination of both. The Group discussed whether an action plan would be a single document detailing all the measures in place on containment in a particular jurisdiction or region but felt that, while such documentation was desirable, this would not be necessary to be consistent with the guidelines. Each jurisdiction is, however, required to have in place measures for minimising escapes; mechanisms for reporting information on the level and causes of escapes; and mechanisms for reporting and monitoring in order to assess compliance and to verify the efficacy of the measures taken. Taken together these elements would comprise an action plan.

International cooperation to minimize adverse impacts on wild stocks

- 5.13 The Williamsburg Resolution calls for cooperation to minimise impacts of aquaculture and related activities on the wild salmon stocks. For example, salmon farming in one jurisdiction clearly has the capacity to impact both farming activities and the wild stocks in another jurisdiction. It is essential that all marine and freshwater salmon farms meet the highest possible standards and that there is international cooperation to exchange information on best practice and agree on actions to eliminate impacts on wild salmon populations. The Review Group noted that few FARs presented information relating to international cooperation between the jurisdictions on matters relating to minimising impacts of aquaculture and related activities on the wild stocks and the outcomes of such cooperation. The Group is aware of international (e.g. the ISFA/NASCO Liaison Group and the WWF Salmon Aquaculture Dialogue) and bilateral (e.g. on border rivers) initiatives that were not referenced in the FARs. Participation in these might be more clearly reported in subsequent FARs. The ISFA/NASCO Liaison Group provides an international forum for developing recommendations for action on wild salmon conservation and sustainable salmon farming practices and the Group urges all jurisdictions with salmon farming to participate in the work of that Group.

Salmon ranching

- 5.14 The Williamsburg Resolution defines salmon ranching as ‘the release of reared Atlantic salmon smolts with the intention of harvesting all that return’. Article 5 of the Resolution states that measures should be taken to minimise impacts of ranched salmon by utilizing local stocks and developing and applying appropriate release and harvest strategies. The FARs indicate that there is no ranching presently being undertaken in the North Atlantic other than on an experimental scale. There has, in the recent past, been large-scale ranching of salmon in Iceland and there is increasing ‘ranching to the rod’ in that country although how this activity would be categorised under the Williamsburg Resolution is unclear. The Review Group notes that this issue might need further consideration as it is possible that this activity could increase in future if marine survival rates improve.

Risk Assessments

- 5.15 Article 4 of the Williamsburg Resolution indicates that the Parties should develop and apply appropriate risk assessment methodologies in considering the measures to be taken to minimise the impacts on wild salmon of aquaculture and related activities. In Annex 7 of the Resolution it is indicated that there is a need to identify the appropriate factors to be included in a risk assessment in order to evaluate the potential impacts of aquaculture and related activities on wild salmon stocks. Such assessments should be an essential part of the approval process both for new farming sites or re-licensing or expansion of existing sites. The Review Group notes that while there is often a requirement to consider the impacts on the marine environment (particularly benthic impacts) or exposure of the site, little consideration appears to be given to the risks to the health, genetic diversity and status of wild salmonid stocks in the decision-making process. Thus, while the potential carrying capacity of the environment may be considered, the effects that the proposed increase in biomass would have on the wild salmon stocks in terms of the prevalence of sea lice, increased disease risk or

increased threats from escapees may not be taken into account. The outcome of all risk assessments should be reviewed in the light of changes in the status of the wild stocks and any increase in production of farmed salmon. The Review Group highlights the frequent absence of wild salmon stock considerations in risk assessments and strongly encourages all jurisdictions to incorporate these considerations into decision-making processes in future.

- 5.16 A number of the FARs refer to risk-based approaches to monitoring and inspections in which farming sites that are considered to be at lower risk of non-compliance would receive less or no monitoring. The Review Group recognises that, consistent with the Precautionary Approach, where high risk sites are identified measures should be taken to eliminate the risks posed to the wild stocks and its environment. Where low risk sites are identified, appropriate monitoring would help to confirm, or reveal changes in, their low risk status.

Transgenic salmonids

- 5.17 The NASCO Guidelines for Action on Transgenic Salmonids (Annex 5 of the Williamsburg Resolution) state *inter alia* that Parties should: take all possible steps to ensure that the use of transgenic salmonids is confined to secure, self-contained, land-based facilities; inform salmon producers of the risks to wild stocks; and take steps to improve knowledge of the potential impacts of transgenic salmonids on wild stocks and their habitat. Most FARs indicate that there is no rearing of transgenic salmonids. However, the FAR for Canada indicates that while no transgenic salmonids have been approved for commercial aquaculture, release, or consumption, research has been approved to rear transgenic salmonids in contained facilities to assess the environmental and human health risks, and the performance characteristics of the fish. The US FAR indicates that an application has been made to the Food and Drug Administration (FDA) for approval to sell transgenic salmon in the US. While most jurisdictions with salmon farming have indicated that the industry is not in favour of rearing transgenics (and at the Liaison Group meeting ISFA has confirmed that it rejects the use of transgenic salmon) few FARs described clearly if the controls exist to ensure any use in the future is consistent with the NASCO Guidelines i.e. in secure, self-contained, land-based facilities.
- 5.18 At its second meeting the Group received additional information that indicated that the FDA's assessment related to whether or not transgenic salmon are safe for human consumption. It is understood that the company making the application proposes to produce transgenic salmon eggs at its facility in eastern Canada and transport these to Panama for rearing to market size. The Review Group believes that the issues raised by the likelihood that transgenic salmon may be available for commercial production in the near future should be thoroughly discussed by the Council and, in particular, the Group believes that it will be important that the clear guidance in the 'Williamsburg Resolution' is applied throughout the North Atlantic area.

River Classification

- 5.19 Article 8 of the Williamsburg Resolution states that for the purpose of developing management measures concerning aquaculture and introductions and transfers, river classification and zoning systems should be developed, as appropriate. Both the Guidelines for Stocking Atlantic Salmon (Annex 4 of the Resolution) and the North American Commission Protocols for the Introduction and Transfer of Salmonids (Appendix 1 of the Resolution) refer to river classification or zoning. While it is clear that many jurisdictions are developing river classification, e.g. under the EU Water Framework and Habitats Directive, few FARs referred to how river classification was used for developing management measures in relation to aquaculture and related activities. This element might be more clearly reported in subsequent FARs. The Group notes that while wild salmon ‘protection areas’ and ‘aquaculture exclusion zones’ have been established in some jurisdictions there is a need to assess their effectiveness in protecting the wild stocks.

Corrective measures

- 5.20 The Williamsburg Resolution states that where significant adverse impacts on wild stocks are identified, the Parties should initiate corrective measures without delay and these should be designed and implemented to achieve their purpose promptly. This is an important aspect of the Precautionary Approach. The Guidelines on Containment of Farm Salmon refer to the need for escape contingency plans, Annex 2 of the Williamsburg Resolution refers to the establishment of gene banks to protect against loss of genetic diversity, and the ‘Road Map’ for *G.salaris*, developed by the North-East Atlantic Commission refers to the need for contingency plans to be developed. Many FARs did not report clearly on this aspect and in others little information was presented on the nature of the measures to be taken to protect the wild stocks when unforeseen impacts are detected. For future reporting, this important aspect of the Precautionary Approach should be addressed.

Socio-economic information

- 5.21 NASCO’s Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach, CNL(04)57, provide a framework for incorporating social and economic factors into decisions which may affect the wild Atlantic salmon and the environments in which it lives. Previous Review Groups have noted that most FARs did not provide a clear indication of how socio-economic factors are incorporated into management decisions. This was also the case for the aquaculture and related activities reports. While some FARs did refer to the social and economic values associated with the salmon farming industry, they did not refer to the economic values associated with the wild stocks which also need to be taken into account in management decisions. There are also instances where the value of the wild stocks has been adversely affected by impacts from aquaculture and related activities. For future reporting, it would be essential that this aspect is addressed. In the interim, the Review Group notes the Council’s intention to hold a Special Session in either 2011 or 2012 on how socio-economic factors are incorporated into management decisions and believes that it would be valuable to have examples relating to aquaculture, introductions and transfers and transgenics.

Evaluation of the effectiveness of measures taken

- 5.22 A central theme of the Precautionary Approach is the assessment of the effectiveness of management measures taken and, where necessary, adaptation of these measures so as to safeguard the wild stocks. Adaptive management is also highlighted in the BMP Guidance. Many of the FARs did not describe programmes to assess the effectiveness of their management measures. In this regard, the Review Group wishes to stress that while it may have indicated in the assessments that the measures taken are consistent with NASCO's agreements, it cannot assess if the measures are effective in safeguarding the wild stocks and achieving the international goals contained in the BMP Guidance. This BMP Guidance contains clear recommendations for reporting and tracking to support assessment of the progress made towards achievement of the international goals. For future reporting, it will be essential that there is clear presentation of the outcomes of the monitoring in support of the BMP Guidance in order to assess progress towards the international goals.

Research, Development and Data Collection

- 5.23 Consistent with the Precautionary Approach a lack of scientific information should not be used as a reason for failing to take conservation measures. The Review Group notes that the jurisdictions have, to varying degrees, developed programmes of research in support of the Williamsburg Resolution. The Group notes that the Liaison Group intends to review this information with a view to identifying research gaps and data deficiencies and wishes to highlight that the BMP Guidance makes specific recommendations on reporting and tracking. In particular, the Review Group notes that while a very low percentage of farm fish escapes, 100% containment may never be achievable and the number of escaped farmed salmon remains large relative to wild fish abundance. Further research and development on improved containment technologies, alternative approaches to the production of sterile salmon and commercial-scale trials with sterile salmon are urgently required. Similarly, in relation to sea lice there is a need for further research and development of vaccines and effective therapeutants, particularly given the evidence of resistance to existing treatments.

General Comments Relating to the Assessments

Introduction

The Review Group recognises that progress has been made by the salmon farming industry in introducing measures intended to minimise impacts on wild salmon stocks. It concluded, however, that in spite of the wealth of regulations and measures demonstrated in the FARs relating to salmon farming, many FARs failed to provide information to demonstrate progress towards achieving the international goals for sea lice and containment.

- 5.24 The Review Group's final assessments are contained in Annex 3. The Review Group recognises that progress has been made by the salmon farming industry in introducing measures intended to minimise impacts on wild salmon stocks. It concluded, however, that in spite of the wealth of regulations and measures described in the FARs relating to salmon farming, many FARs failed to provide information to demonstrate progress towards achieving the international goals for sea lice and containment. The salmon farming industry is very successful but it is its scale and continuing growth that poses real challenges to addressing impacts on the wild stocks. The level of escapes may now be an extremely small percentage of the farmed salmon production but remains high relative to the numbers of wild salmon. Similarly, the number of sea lice may be less than one per farmed fish but that may still translate to large numbers of lice in the environment because of the scale of production. Often the monitoring described is related to the situation at the farms rather than focusing on the wild fish. However, the Review Group welcomes the establishment of more quantitative international goals and the reporting and tracking that includes monitoring of wild fish as recommended in the BMP Guidance.

The level of escapes may now be an extremely small percentage of the farmed salmon production but remains high relative to the numbers of wild salmon. Similarly, the number of sea lice may be less than one per farmed fish but that may still translate to large numbers of lice in the environment because of the scale of production.

Scale of Activities

Jurisdictions with a large production of farmed salmon bear a particular responsibility to minimize the threats that their activities pose to the wild stocks domestically and internationally.

- 5.25 Over the last twenty years or so, there has been a dramatic growth of salmon farming in the North Atlantic (see Figure 1 below). There can be little doubt that the scale of the salmon farming industry (production in the North Atlantic is now around 600 times the harvest of the wild fish) means that it has the potential to do more damage than other aquaculture practices and, therefore, has a responsibility to eliminate impacts. The findings of the 2005 ICES/NASCO Bergen Symposium highlight that the major challenges in managing impacts of aquaculture on the wild stocks relate to containment and sea lice in salmon farming. It was in recognition of these threats that the Liaison Group recently agreed on the BMP Guidance to strengthen the interpretation and application of the Williamsburg Resolution. Jurisdictions with a large production of farmed salmon bear a particular responsibility to minimize the threats that their activities pose to the wild stocks domestically and internationally. These jurisdictions may wish to consider whether national and regional limits on total salmon farming production as well as on densities of facilities would be appropriate. That said, however, it should also be noted that even low levels of salmon farming and poorly planned introductions and transfers still have the potential to adversely affect wild salmon populations on a local scale. The guidance in the Williamsburg Resolution and the BMP Guidance needs to be fully implemented by all jurisdictions with stronger measures where local conditions dictate.

Even low levels of salmon farming and poorly planned introductions and transfers still have the potential to adversely affect wild salmon populations on a local scale.

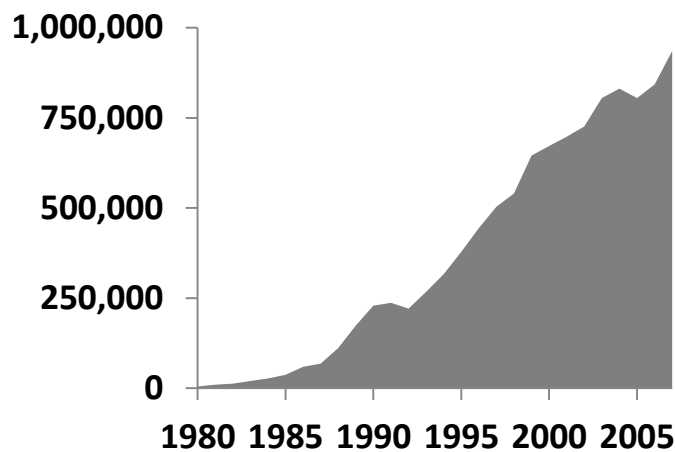


Figure 1: Production of farmed Atlantic salmon in the North Atlantic (Source: ICES)

Responsibility for setting standards

- 5.26 The Review Group considers that there is a need for caution in assigning responsibility for setting standards for containment, disease prevention and control and for compliance monitoring. In some jurisdictions, both are the responsibility of the salmon farming industry and, in the some cases, compliance is voluntary. The Review Group notes that there is an evolution from voluntary measures to legislation in a number of jurisdictions and believes that better protection of the wild stocks from adverse impacts may be achieved when government authorities set technical and environmental standards, oversee monitoring and impose strict monitoring requirements and schedules. There should also be monitoring programmes of wild salmon populations to determine impacts from salmon farming as recommended in the BMP Guidance. The Review Group believes that it is essential that measures designed to safeguard the wild salmon stocks are enforced and that any non-compliance is addressed.

Containment

- 5.27 The Review Group notes the recommendations in the BMP Guidance concerning reporting and tracking in support of the international goal on containment and wishes to stress that escaped farmed salmon should always be reported as numbers of escaped fish from farms (both marine and freshwater facilities) with the total number of farms together with monitoring for escapees in wild salmon populations (e.g. numbers and percentages in fisheries and spawning stocks). This information will enable a clearer assessment of the impacts on the wild stocks and the effects of salmon farming development. Often, contingency plans for escapes include only efforts to recapture escaped farmed salmon in the vicinity of the cages, but consideration could also be given to the opportunities to recapture escaped farmed salmon migrating into rivers where this can be achieved without damaging the wild

stocks. Evidence suggests that escaped farmed salmon disperse rapidly from the site so recapture efforts immediately following an escape event may not be successful. These recapture efforts should not be seen as an alternative to stringent measures to improve containment. The Review Group notes that the BMP Guidance identifies methods to track the origin of escaped farmed salmon as a factor that would facilitate implementation of the guidance. This is an international issue because escaped farmed salmon can, and do, migrate between jurisdictions. The Review Group considers that there should be an effective tagging or marking system that enables escaped farmed salmon from both freshwater and marine farms to be identified in the wild (e.g. a visual mark or tag) and that would allow identification of the facility from which the fish originated (e.g. genetic marking).

The Review Group considers that there should be an effective tagging or marking system that enables escaped farmed salmon from both freshwater and marine farms to be identified in the wild and that would allow identification of the facility from which the fish originated.

Sea lice

Resistance to sea lice treatments is a worrying development.

- 5.28 Sea lice larvae can survive independently in coastal waters for 20-50 days during which time they may be dispersed along the coast (as far as 180km during a 15 day period). Consequently any treatment zone for this parasite must be large in order to be effective. Other salmonids, such as sea trout, may suffer infestation rates higher than those on wild Atlantic salmon. The Review Group notes the recommendation in the BMP Guidance on reporting and tracking and wishes to stress that, from the perspective of minimizing impacts on the wild stocks, lice monitoring programmes are required not just on the farmed fish in the cages but also on wild salmonids if there is to be an assessment of progress towards the international goal. Monitoring, at appropriate times of year, of lice loads on wild salmonids in areas with and without farms as well as of lice-induced mortality of wild salmonids, that have been treated or that are held as sentinel fish in cages, are needed to better assess sea lice impacts on the wild stocks. At present this monitoring is not commonly conducted. Monitoring for the efficacy of sea lice treatments is also essential and is commonly done. Ideally monitoring would be undertaken by governments with industry support. Resistance to sea lice treatments is a worrying development. One important control mechanism is coordinated fallowing over large geographical areas along with single year-class stocking. In a defined region all farmed fish should be the same age and the focus should be on the numbers of fish (hosts) rather than biomass, which changes over time. Where possible, several treatment methods should be used to prevent resistance developing. Vaccination, if developed, against sea lice is unlikely to be 100% effective. There should be contingency plans that would apply in the event of a serious outbreak so that there is a rapid and effective response to prevent the transmission to the wild stocks and spread of the disease and parasite (including treatment methods, restrictions on movements, mass harvesting, disposal arrangements etc.).

NGO Statements

- 5.29 All of the statements in this report were unanimously agreed by the Review Group. A number of other statements were made by the NGOs which did not find unanimous support from the rest of the Review Group. These are contained in document IP(10)32 (Annex 4).

Feedback on the Group's Draft Report

- 5.30 At NASCO's 2010 Annual Meeting, the Council had agreed that each jurisdiction should be given the opportunity to provide feedback to the Review Group on the assessments contained in its draft report, CNL(10)12. Feedback had been received from Canada, the Faroe Islands, UK - Scotland, Norway and the USA and is contained in document IP(10)34 (Annex 5). Feedback had also been received from ISFA, CNL(10)33 (Annex 6) and the NGOs had provided a response to the comments from ISFA, CNL(10)37 (Annex 7). Feedback had also been provided during the 2010 Special Session, IP(10)30. The Review Group was asked to take this feedback into account in finalising its report. It has done so where it felt that this was appropriate and its final assessments are contained in Annex 3. The Review Group has responded to this feedback in paragraphs 5.33 – 5.41 below.
- 5.31 The Review Group notes that a number of comments in the feedback related to the nature of the template developed to assist jurisdictions in preparing their FARs. This template was developed by the Council, not the Review Group, and combined the elements in the Williamsburg Resolution with those in the BMP Guidance. Opinions expressed suggested that the template both led to duplication of reporting and was restrictive. It was also suggested that the reporting measures for the FAR were not understood. As the template was based exactly on the elements in the NASCO agreements, the Review Group found this concern surprising.
- 5.32 The Group also noted that there were also criticisms in the feedback from ISFA that the NGOs had been able to circulate the FARs widely before the industry had seen the reports (and presumably other jurisdictions). The Group is aware that the 'Next Steps' Review Group will be considering future reporting arrangements prior to NASCO's Twenty-Eighth Annual Meeting. The Group recommends that in the interests of transparency, consideration might be given to making all FARs available on the NASCO website prior to their review.

Response to feedback from the jurisdictions

- 5.33 The Review Group welcomed the feedback from the jurisdictions which was carefully reviewed by the Group at its second meeting. Some of this feedback indicated that new initiatives were underway to, for example, improve containment and enhance monitoring for sea lice. In the interests of fairness to other jurisdictions that had decided not to provide feedback, any new information that related to measures that had been introduced subsequent to the submission of the FARs i.e. during 2010, was not taken into account by the Group in reviewing its assessments. This information might be expected to feed into the next round of FARs. While the Group welcomes these initiatives, some of which were still under development, they did not result in a change to the assessment unless they had resulted in the implementation of new

measures or actions consistent with the agreements. Some jurisdictions provided additional information but it was not in enough detail to allow the Group to assess it.

- 5.34 In the case of the information provided by Canada and Norway, the additional information resulted in the Review Group making some changes to the assessments in its draft report.

Response to feedback from ISFA

- 5.35 The Review Group considered carefully the comments on its draft report from ISFA, CNL(10)33. The Group is aware that NASCO's accredited NGOs had also responded to these comments in document CNL(10)37. The comments from ISFA include information relating to aquaculture, introductions and transfers and transgenics that was not included in the FARs for four jurisdictions (Canada, Norway, Scotland and the USA). The FARs were submitted to the Review Group by the jurisdictions and not by the industry. Therefore, it was felt more appropriate for the jurisdictions to consider the comments from the industry about a specific FAR rather than the Review Group. ISFA also heavily criticised the process used to conduct the review, the clarity of goal statements, and what it claimed was the inclusion of opinions rather than evidence and science-based comments, and it criticised the role of the NGOs.
- 5.36 The Review Group does not accept the ISFA comment that the review was 'fundamentally flawed' or those criticisms concerning its composition, Chairman or the status of the NGOs. The process used by the Review Group was set by the Council and was the same as for all the three previous reviews. These were all internal reviews intended to assess progress in implementing NASCO's agreements and did not include industry representatives.
- 5.37 However, the Council did go to great lengths to ensure that ISFA was kept informed of the work of the Review Group and to allow it to comment on its findings (both the draft and final reports are presented to the Liaison Group before consideration by the Council. ISFA representatives also attended the 2010 Special Session when NASCO discussed the draft report). The Review Group can accept some of ISFA's suggestions regarding the format of its report and has made a number of changes to address these (including annexing the NGO statements and including brief biographical notes on the reviewers).
- 5.38 The Group also rejects the criticism that its assessments were not based on evidence but only opinions. In fact, the Review Group had an unprecedented and enormous amount of factual information before it in the FARs and it was this information that formed the basis of its assessments. The Group did, however, re-examine its report to ensure that the opinions expressed were justified.
- 5.39 The Group was disappointed by the adversarial tone of the response from ISFA. ISFA states that an environmentally sustainable industry 'should not be impeded, but rather complemented by the work undertaken by NASCO'. In fact, the Council's intention in conducting the review was to assess progress in implementing its agreements to conserve the wild salmon stocks and encourage sustainable salmon farming practices. The Review Group notes that ISFA states that its objectives include 'conserving and enhancing wild salmon stocks' and it had, therefore, been hoped that the issues raised would be taken in the spirit of genuine feedback from a

Review Group only concerned to see significant progress in implementing the NASCO agreements.

- 5.40 Of great concern to the Group are the statements in the ISFA document that the international goals in the BMP Guidance adopted in 2009 by both NASCO and ISFA are ‘inherently unachievable and unrealistic’ and that ISFA agreed to these goals with ‘serious concerns’. The Review Group believes that this statement calls into question ISFA’s commitment to cooperation with NASCO to make progress towards the international goals and to ensure that wild salmon stocks are as healthy in areas with salmon farms as in areas without farms.

- 5.41 The Review Group recognises the progress made by the Liaison Group in developing the Guidelines on Containment of Farmed Salmon (Annex 3 of the Williamsburg Resolution) and more recently the BMP Guidance, and in particular it welcomes the development through this cooperation with the industry of the international goals for sea lice and containment. However, it believes that future cooperation between NASCO and ISFA can only have meaning if there is commitment to the international goals and the agreed principle that wild salmon stocks should be as healthy in areas with farms as in areas without farms. The Review Group recommends, therefore, that the Council seek an appropriate assurance from ISFA about its commitment to this principle and the international goals.

6. Identification of common challenges and common management and scientific approaches to address them

- 6.1 The Council asked that the Review Group identify common management and scientific approaches to challenges as reported in the FARs. This overview is intended to facilitate an exchange of information among the Parties and is contained in Annex 8. It includes some recommendations on future reporting through aquaculture, introductions and transfers and transgenics FARs and other approaches for further improving the exchange of information.

7. Arrangements for the 2010 and 2011 Special Sessions

- 7.1 The Group discussed arrangements for presentation of both its draft and final reports both to the Liaison Group meetings and to the Council at the Special Sessions during the 2010 and 2011 Annual Meetings. For the Liaison Group meetings, the report would ideally be presented by members of the Review Group and this was the case for the 2010 meeting. However, if none are able to participate in the 2011 Liaison Group meeting, the Coordinator agreed to present the report.
- 7.2 For the Special Sessions, it was agreed that following a general introduction from the Coordinator describing the way the Group had approached its work, there would be a presentation of the assessments by at least one Group member from the Parties and one from the NGOs.

8. Report of the meeting

- 8.1 The Group agreed its final report.

9. **Any other business**

9.1 There was no other business.

10. **Close of the meeting**

10.1 The Coordinator thanked the members of the Review Group for their valuable contributions, very hard work on the reviews and their effort to ensure fairness, balance and consistency.

Biographies of the Members of the Review Group

Mr Torfinn Evensen

Torfinn Evensen is Managing Director of Norwegian Salmon Rivers, based in Oslo, Norway. He holds a Cand. Agric degree in natural resource management from the Norwegian University of Life Sciences. He has experience as a professional natural resource manager in the Norwegian Touring Association where he served as specialist in monitoring the effects of human activity on nature and the environment. He has led a number of programs for developing sustainable tourism. He also served as a member of a Governmental Committee with responsibility for developing the new planning act in Norway, including interaction with other acts e.g. those concerning aquaculture. In recent years, he has concentrated on the impacts of the Atlantic salmon farming industry on wild salmonids.

He is a member of the national advisory board on salmon management in Norway. He is coordinator of the NGO-group of ten Norwegian organizations, dealing with conservation and management of wild salmon.

Norwegian Salmon River is an organization for holders of fishing rights in salmon rivers. Its objectives are: 1) conservation and enhancement of salmon stocks, 2) local management by river associations and 3) development of fishing tourism, based on local ownership and sustainable fishing activities. Each river association is responsible for management of the local fishery in accordance with the Salmonid Fisheries Act including the development of management plans, adoption of fishing rules (bag limit, length of fishing season, allowed lures, etc.), catch reporting, establishing and operating stations for disinfection of fishing gear, supervision – warden/ bailiff, enhancement activities to improve the fishing (fish ladder construction, stocking programs, habitat improvements etc) and improving access.

Ms Heidi Hansen

Heidi Hansen is senior advisor in the fish management division of the Directorate for Nature Management in Norway. She is coordinating the Directorate's work in protecting wild Atlantic salmon from negative effects from salmon aquaculture. She has a Cand. scient degree in freshwater fish biology from the University of Oslo with special focus on the effects of alien invasive species/organisms. For several years, she was a fishery officer at the County Governor's office in Oestfold County with responsibility for managing wild anadromous fish and fisheries. In this period, she was responsible for coordinating the processing of applications for aquaculture licenses in freshwaters. For a period of time she served as manager and biologist at Lafjord Aqua Products (fishfarm). During 2010, she has participated in an expert committee, appointed by the Norwegian government, for effective and environmental sustainable use of the coastline for aquaculture. The committee has suggested a new geographical structure to ensure effective use of area and minimize negative impacts on the environment. This work will be important for the future development of the aquaculture industry in Norway.

Mr Tim Sheehan

Timothy Sheehan is a Research Fishery Biologist with NOAA Fisheries Services' Atlantic Salmon Research & Conservation Task based out of Woods Hole, Massachusetts USA. He has been studying Atlantic salmon since 1995. Since that time he has worked cooperatively with a variety of International, Federal and State agencies, Federal fish hatcheries and the Atlantic salmon farming industry in Maine on a number of research and restoration oriented projects. Starting in 2002, his focus shifted towards marine and international science and management issues. He has been a member of the International Council for the Exploration of the Seas' Working Group on North Atlantic Salmon since 2003, serving as its Chairman from 2006-2008. He served as the Program Coordinator for the international sampling effort at Greenland since 2002 and also serves as the Principle Investigator on a number of other marine research projects investigating Atlantic salmon marine survival issues. He is an active participant at NASCO and serves as the Scientific Advisor to the United States Delegation. He also serves on NASCO's Standing Scientific Committee and Scientific Advisory Group, serving as the Scientific Advisory Group's Chairman starting in 2010.

Mr Robert Steinbock

Robert Steinbock is the Assistant Director, Straddling and Salmon Stocks Division, International Affairs Directorate of the Department of Fisheries and Oceans in Ottawa, Canada. With the Department since 1981, he has developed extensive experience in bilateral and multilateral fisheries negotiations as well as in international market access issues and international trade development. He is currently responsible for developing Canada's policy positions to the Northwest Atlantic Fisheries Organization (NAFO), the North Pacific Anadromous Fish Commission (NPAFC) and the North Atlantic Salmon Conservation Organization (NASCO). In recent years, he has participated in negotiations aimed at reforming key regional fisheries management organizations consistent with the United Nations Fish Stocks Agreement and other recent international instruments. This work led to NAFO's adoption of amendments to its Convention, revisions to the NAFO Conservation and Enforcement Measures and the development of the terms of reference and assessment criteria for the NAFO performance review to begin in early 2011.

Ms Boyce Thorne Miller

Boyce Thorne Miller is Science and Policy Coordinator for the Northwest Atlantic Marine Alliance and is the North American NGO representative to the aquaculture review group. She has worked since 1988 as a science advisor/director for several US and international environmental NGOs, covering marine environmental issues including pollution, biodiversity and fisheries. She has represented NGOs in several international forums, including the London Convention, 1972 on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters from 1990-5; the UNEP Intergovernmental Conferences resulting in the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities from 1994-5; and GESAMP subgroup on the sea-surface microlayer, 1995. She has participated in NASCO since 1999. She was a member of working advisory committee, *US Framework for Offshore Aquaculture Development*, Chm. Biliana Cicin-Sain, University of Delaware Marine Policy Center, 2004-5. She is author of two books on marine biodiversity, peer reviewed scientific papers on marine ecology and pollution, and reports on marine environmental issues. She received her MS in Oceanography from the University of Rhode Island.

Dr Malcolm Windsor (Coordinator)

Malcolm Windsor is the Secretary of NASCO based in Edinburgh. He started NASCO from the beginning in 1984 after the NASCO Convention came into force and has served as Secretary ever since. The work involves fostering cooperation by the Parties and their jurisdictions on management of fisheries, salmon habitat and aquaculture and related activities as well as agreeing certain management measures in Greenland and the Faroe Islands all in order to conserve wild salmon stocks. He has worked to develop the cooperation with the salmon farming industry through the Liaison Group since its inception. Before that he was the Fisheries Adviser to the Chief Scientist at the, then, Ministry of Agriculture and Fisheries in London. Prior to that, he worked as a researcher at a government laboratory in Hull, Yorkshire. He has a PhD in Physical Chemistry and worked on thermodynamics of inter-molecular forces at the University of California for 2 years. Prior to that he had experience in the food industry working on product development at Cadbury Ltd. He was awarded the Order of the British Empire in 2005 for Services to International Salmon Conservation.

Note: No biography was available for Ms Marita Rasmussen

Terms of Reference and Working Methods

Terms of Reference

1. At its Twenty-Sixth Annual Meeting, the Council of NASCO had agreed on a format for the aquaculture and related activities Focus Area Reports (FARs), the composition of the Review Group, its Terms of Reference (ToRs) and a work schedule, CNL(09)15. The ToRs for the Review Group are as follows:
 1. Review and analyse the FARs on Aquaculture, Introductions and Transfers, and Transgenics.
 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 on each FAR where additional actions may be helpful to ensure implementation of the 12 commitments within the Williamsburg Resolution.
2. In 2009, the Council had considered an interim report from a Task Force established by the ISFA/NASCO Liaison Group to develop a series of best practice recommendations to address the continuing impacts of salmon farming on wild salmon stocks, CNL(09)17. The Task Force had developed 'Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks', SLG(09)5, hereinafter referred to as 'BMP Guidance' intended to assist NASCO's jurisdictions in framing the management of salmon aquaculture, in cooperation with their industries, in developing future NASCO Implementation Plans and in preparing their Focus Area Reports for the 2010 review and subsequently. The Council had adopted this BMP Guidance and agreed with the recommendation of the Task Force to incorporate this BMP Guidance in the format for the FARs. The recommended revised format for the FARs based on CNL(09)15 and including the elements from the BMP Guidance is contained in document CNL40.970 which had been circulated to the Parties to assist them in completing their FARs. The Group noted that the Council of NASCO had not amended the Group's Terms of Reference in the light of adoption of the BMP Guidance which had been adopted by both the International Salmon Farmers Association (ISFA) and NASCO. These TORs still requested the Group to compile recommended best practice although this work had been undertaken by the Task Force and used as a basis for the information to be provided in the FARs. The Group decided, therefore, that it would review the BMP Guidance and provide feedback to the Council.
3. The procedure the *Ad Hoc* Review Group was asked to use to accomplish its work is as follows:

1. Meet in February 2010 to review the FARs submitted, collaborate to highlight questions and/or issues to be sent back to the Parties/jurisdictions by March 1, 2010. 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 1 April 2010.
 2. Provide a draft report, as described in item 2 (in paragraph 1 above), by 15 May 2010 for circulation to Parties prior to the annual meeting.
 3. Present an overview of the draft report at the Special Session at the 2010 Annual Meeting, and facilitate a discussion on the four areas identified above in item 2 (in paragraph 1 above). 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 31 August 2010.
4. The Review Group discussed its working methods. Prior to the first meeting a format for assessing the FARs had been developed based closely on the elements contained in document CNL40.970 (see paragraph 8 below). An initial reviewer was assigned to each FAR from among the NASCO representatives and the NGOs also undertook initial reviews of all the FARs. These initial reviews from the NASCO representatives and the NGOs formed the basis for deliberations by the whole Group.
 5. The Review Group noted that in addition to the presentation at the Special Session, the Council had agreed that the draft report of the Review Group should be made available for consideration at the Liaison Group meeting in late April 2010, before the report is considered by NASCO. The Review Group agreed that it should, therefore, aim to complete its draft report for circulation to the Parties and the Liaison Group by the end of March 2010 at the latest.

Methodology

6. The Group agreed on a number of ‘ground rules’, based on those used by the previous three *Ad Hoc* Review Groups to guide its work in undertaking the reviews. These were as follows:
 - (a) An initial reviewer was appointed for each FAR who was asked to lead the discussion within the Group and to develop an assessment of consistency of the actions documented in the FAR with the Williamsburg Resolution and BMP Guidance;
 - (b) The initial reviewers would remain anonymous in the report and in the event that one or more members of the Review 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 Review Group expressed the dissenting views unless they wished to be identified;

- (c) The Review Group would base its reviews only on the information presented in the FARs and the final Implementation Plans;
 - (d) Because not all jurisdictions were represented on the Review Group, it was agreed that the NASCO representative on the Group from a jurisdiction whose FAR was being reviewed would not be present during the review of that report;
 - (e) Following the completion of the reviews all assessments were re-examined to ensure consistency.
7. The Review Group's TORs allowed for questions and issues to be raised with the jurisdictions before the Group completed its assessments. At its first meeting, the Review Group decided that in view of the limited time available before its draft report was to be made available to the Liaison Group, it would not seek further clarification from the jurisdictions but would base its assessments on the FARs as submitted. This would also be more transparent as any issues that either the Review Group or the jurisdictions wished to raise would be done so during the 2010 Special Session. While not required under its TORs, the Review Group decided to ask the Secretary to send the draft assessments completed at the first meeting to the jurisdictions indicating that it did not seek any feedback until the Special Session at the Twenty-Seventh Annual Meeting. Following that Special Session, the Group would carefully consider all feedback on its findings when finalising its assessments.
8. The Group developed a format to facilitate an assessment of the consistency of measures detailed in the FARs with the guidance from the Council. This 'check list', based closely on the elements in document CNL40.970, comprised the following:
- There is an overview of activities, policy and management structures;
 - Initiatives for international cooperation to minimize adverse impacts on wild stocks are described;
 - Progress towards achieving the international goals for sea lice and containment is described;
 - There is a process to demonstrate prior to approval that proposed activities will not have a significant impact on wild salmon stocks;
 - Appropriate risk assessment methodologies are being applied including in relation to site selection;
 - An Action Plan has been developed and implemented to minimise escapes including: a Code of Containment and system for verifying compliance; technical standards for equipment; and procedures for reporting losses and their causes;
 - Measures to minimise the impacts of ranched salmon have been implemented;
 - Measures to minimise interactions from salmon enhancement activities, including introductions and transfers, have been implemented;
 - Measures to minimise the risk of diseases and parasite transmission to wild stocks have been implemented e.g. area management, integrated pest management, single year class stocking and fallowing;
 - Measures to control movements into a Commission area of reproductively viable Atlantic salmon or their gametes and introductions of reproductively viable non-indigenous anadromous salmonids or their gametes exist;

- Procedures exist to ensure no introductions of non-indigenous fish into a salmon river occur that would have unacceptable risks of adverse impacts;
- The NASCO Guidelines for Action on Transgenic salmon are being applied e.g. rearing of transgenic salmonids is confined to secure, self-contained land-based facilities;
- River classification and zoning systems have been developed where appropriate;
- Procedures are in place to initiate without delay corrective measures where adverse impacts are identified. There is a description of any factors impeding implementation of the BMP Guidance;
- Research and data collection are undertaken in support of the Williamsburg Resolution including monitoring programmes related to sea lice, containment and escapes;
- Educational materials have been developed to increase awareness of the risks of introductions and transfers;
- The effectiveness of measures taken is evaluated both in terms of the extent of and timescale of the effects;
- There is a clear explanation of how socio-economic factors are applied and how this affects attainment of NASCO's objectives.

9. For each of these elements the Review Group assessed if the approach was well developed and generally in accordance with NASCO's agreements. In presenting its assessments, the Group first described the elements that it felt required additional actions to ensure implementation of the NASCO agreements and then used standard text in a series of bullets to highlight these. However, as with previous Review Groups, it did not suggest the nature of the actions as this would be a matter for the jurisdiction concerned. The elements listed in paragraph 8 above are not all of equal importance in terms of minimising impacts of aquaculture and related activities on the wild stocks.

IP(10)33***Assessments of the FARs***

The Review Group's assessments of the fourteen FARs follow. They should be read in conjunction with the general comments that apply to all of the FARs in paragraphs 5.9 to 5.23 of the Group's final report.

Canada

The Review Group is aware that the salmon farming industry in Atlantic Canada is concentrated in the province of New Brunswick, with significant activities also in Nova Scotia and Newfoundland and Labrador. Production in 2008 was 35,000 tonnes, the fourth highest production in the North Atlantic. There is also significant production of farmed Atlantic salmon on the West Coast of Canada. The FAR indicates that in order to achieve single-year class farming, six major aquaculture Bay Management Areas were established in the Bay of Fundy in 2006. Each year, one-third of all sites is left fallow while another third is receiving smolts and the remaining third is harvesting product. The fallowing practice is designed to break the cycle of sea lice before an outbreak can occur. SLICE has recently been approved for use in Canada, and is the only authorised treatment. Introductions and transfers are governed by the 2002 National Code on Introductions and Transfers of Aquatic Organisms and related regulatory procedures. The majority of the introductions and transfers are for salmon farming but there are also significant movements for wild stock enhancement purposes. Under the Code, a licence will only be issued for the release or transfer of fish if it will not adversely affect the stock size or genetic characteristics of fish stocks. Since the introduction of the Code, Canada has not approved any new introductions or transfers of non-indigenous fish into rivers containing Atlantic salmon. Initiatives are underway to address unlawful introductions. A new National Aquatic Animal Health Program has been developed and the Health of Animal Act is being amended to provide protection for farmed and wild aquatic animals against infectious diseases. Canada is the only jurisdiction to report rearing of transgenic salmon. This is for research purposes in land-based closed containment systems.

Both Federal and Provincial governments are involved in the management of aquaculture and related activities in Canada. Different regulatory approaches are being used in different provinces and in some cases only examples from specific provinces were provided in the FAR. This made it difficult to assess the FAR as a whole, although more complete information was provided in the feedback received from Canada in relation to containment and sea lice management measures.

No data were presented to describe progress towards achievement of the international goals for sea lice and containment. The FAR states that the incidence and number of escapes are declining in all provinces as a result of the measures introduced even though farmed production is increasing. However, it is also stated that the records are not yet maintained by the Provinces in a format that allows easy analysis. The Review Group notes that while Codes of Containment have been developed and implemented consistent approaches are not used across the Provinces. For example, immediate reporting of escapes is not required in Nova Scotia (where it is, however, common practice). In New Brunswick, where the industry

is located close to endangered wild salmon populations listed under the Species at Risk Act, the code is voluntary but in Newfoundland it is mandatory. There is not yet an integrated pest management system although this is being developed and the issue of inconsistent approaches across Provinces referred to above applies to measures to minimise disease and parasite transmission. Contrary to the Williamsburg Resolution and the NAC Protocols there is no general prohibition on importation of reproductively viable Atlantic salmon from outside the Commission area, although such imports are rare. There was a lack of a clear description of the procedures involved in corrective measures where adverse impacts are identified.

The following issues are not consistent with NASCO's agreements and need additional actions:

- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- procedures in place to initiate corrective measures are not adequately described.

Denmark - Faroe Islands

Atlantic salmon are not native to the Faroe Islands. However, stocking of salmon of Icelandic and Norwegian origin has resulted in the establishment of salmon runs maintained by stocking in four small rivers and an annual catch of 400 – 600 fish. Stocking of sea trout is also undertaken. It is not clear whether there is natural production of salmon in the rivers that are enhanced by stocking or if the salmon runs are entirely hatchery maintained. The Faroe Islands is the third largest producer of farmed salmon in the North Atlantic. Production has increased to approximately 50,000 tonnes in 2009 following reduction in the incidence of diseases (mainly ISA) which had resulted in a sharp fall from the peak production of 60,000 tonnes in 2003. The FAR states that NASCO's agreements are largely not relevant in the context of the Faroe Islands because there are no self-sustaining wild salmon stocks. While the Review Group recognises that the salmon populations in Faroes were introduced, it remains unclear if these should be considered wild given the length of time they have been established. Furthermore, escaped farmed salmon are an international issue so the measures taken to minimise escapes and prevent disease outbreaks are important in that context, particularly given the close proximity to marine feeding grounds for wild salmon.

Containment measures include a requirement that equipment is built and installed to an 'adequate' strength, monthly inspections of nets by certified divers and mandatory reporting of escapes. The FAR indicates that there have been few reported significant escape incidents in recent years. Fish health is monitored monthly through all stages of production, imports to the Faroe Islands are regulated in accordance with EU fish health regulations, and fallowing and single-year class stocking are used. Regulations intended to reduce the occurrence of sea lice in farmed fish and to impair the development of resistance to preventative treatment have

been developed that require regular sampling for, and reporting of, sea lice on farmed fish and sets out the required procedures for treatment, which can also require coordinated efforts between fish farming facilities. Medical treatment of sea lice is registered by date of treatment, medicine and dosages.

While there is international cooperation with other research institutes, no cooperation is described in relation to minimising impacts on the wild salmon stocks. The FAR indicates that sea lice caused serious problems for the industry in 2009 resulting in new measures to improve treatment methods and their coordination and lice monitoring. However, no data is provided to allow assessment of progress towards achieving the international goals for either sea lice or containment. While there is a requirement to report losses and there are inspections of the nets, there is no overall Code of Containment, no detailed technical standards for equipment and no system for verifying compliance with standards. The procedures to control movements into the Commission area are based solely on health status of the exporting country. There is a procedure in place for implementing corrective measures in the event of heavy metal or organic matter build-up in the sediments around farms and contingency plans are in place in the event of a large scale escape or disease outbreak, but no details on these plans were provided.

The following issues are not consistent with NASCO's agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- procedures in place to initiate corrective measures are not adequately described.

EU – Denmark

There is no salmon farming in Denmark. There are five salmon rivers, four of which have wild stocks and valuable efforts are being made to rebuild these stocks through stocking and habitat restoration work. Broodstocks for stocking are obtained from each river and the resulting progeny are only released back into that river (except in the case of rivers that have lost their salmon population). Crossing between the wild strains is not permitted and they are held separately in the hatcheries. Genetic guidance has been developed and applied regarding optimal numbers of spawners and breeding protocols. A proportion of the released hatchery fish are marked to allow evaluation of the stocking programme. The FAR indicates that the two hatcheries both use re-circulated water and high health status is maintained. Stocking is mainly of fed fry but smolts are also released particularly in the river with no wild stocks.

The FAR indicates that containment in the hatcheries is 100% but no information is presented on the containment measures in support of this statement. No information was presented concerning controls on movements of non-indigenous anadromous salmonids originating outside the Commission area. While the FAR indicates that the introduction of foreign

strains of Atlantic salmon is not allowed, no information was presented in relation to introductions of non-indigenous species or on the procedures for implementing corrective measures where adverse impacts are identified.

The following issues are not consistent with NASCO's agreements and need additional actions:

- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- the procedures to ensure that no non-indigenous fish species are introduced into a salmon river that would have unacceptable risks of adverse impacts to the wild stocks are not adequately described;
- procedures in place to initiate corrective measures are not adequately described.

EU – Finland

There are only two Atlantic salmon rivers in Finland, the rivers Teno and Naatamo, both border rivers with Norway. There is no coastline and, therefore, no marine salmon farming in Finland although there is on the Norwegian coastline. In the River Teno, fish farming is not allowed, no releases of fish of any kind are permitted within the salmon migration area and transfers from other watersheds into the Teno of live fish or eggs that have not been disinfected are prohibited. In practice, the only aquaculture activity permitted is small-scale transfers of indigenous fish between lakes or tributaries within the Teno catchment outside the salmon migration area and only under licence. In the Naatamo, transfers from other watersheds into the catchment of live fish or eggs that have not been disinfected are prohibited but there is no general prohibition on fish farming and stocking. However, in practice there is only one small hatchery that releases newly hatched fry of char, whitefish and grayling derived from eggs collected from wild broodfish in lakes outside the salmon migration area. This hatchery is subject to annual health inspections.

A monitoring programme is in place for the parasite *G.salaris*, a contingency plan is being developed, new legislation intended to prevent the possible spread of the parasite has been introduced and educational materials (roadside signs, leaflets, video tapes) to increase public awareness of the parasite, its effects on wild salmon and the measures required to prevent its spread have been developed in cooperation with Norway. The Review Group believes that such cooperation between Sweden, Norway, Finland and Russia on *G.salaris* is very important. There is monitoring to identify the origin of salmon (wild or escaped farmed) covering all fishing methods and seasons in both rivers.

These procedures are consistent with the NASCO agreements and guidelines.

EU – France

The Review Group is aware that France has some major salmon rivers but that the presence of numerous dams has resulted in the loss of habitat resulting in the loss of some stocks and severe declines in others. Restoration and rebuilding efforts are being undertaken and ten rivers have stocking programmes to restore lost wild stocks, sustain remaining stocks and

maintain fisheries. The hatcheries mainly produce eggs, unfed and fed fry but smolts are also stocked. Rearing at freshwater hatcheries is in tanks and the outlets are fitted with screens to prevent escapes. The stocking policy has evolved from being based on imported eggs to the use of native strains. Fish are now stocked at earlier life-history stages and progress is being made in developing genetic guidance for hatchery programmes. However, the limited numbers of available wild spawners and their sex ratios is a concern since the need to protect the wild stocks from which the hatchery material is sourced is recognised. There are two marine sites for commercial salmon farming located in sheltered locations with a production of 1,500 tonnes; one of these farms utilises local French stocks while the other uses Scottish strains. There are inspections of nets and all escapes must be reported and there are risk-based site inspections.

The FAR indicates that while there is some international cooperation through the Federation of European Aquaculture Producers, collaboration on the restocking programme is rare within France and internationally. No information was presented to allow assessment of progress towards the international goals for sea lice and containment and reference is made to a number of ‘black spots’ relating to aquaculture that need to be addressed. Although the FAR indicates that a comprehensive dossier of information must be provided before a licence for salmon farming is issued, it is not clear if this is the responsibility of the proponent of the activity or the authority. Freshwater hatcheries are required to screen outflows and marine sites must report escapes, but there are no technical standards for marine farms. The FAR recognises that further progress in implementing genetic protocols and in assessing the health status of spawners is required in the stocking programme. There is no reference to measures for the control of sea lice such as single year-class stocking or fallowing. While no non-native salmon stocks have been used for many years in France, there is no law prohibiting movements that originate from outside the Commission area. No procedures for initiating corrective measures have been described in relation to salmon farming although areas for improvements to hatchery practices for the stocking programmes have been identified.

The following issues are not consistent with NASCO’s agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- no information is presented to allow assessment of progress towards the international goals for sea lice and containment;
- the process to demonstrate prior to approval that proposed activities will not have a significant impact on wild salmon stocks is not adequately described;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to minimise interactions from salmon enhancement activities are not adequately described;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- procedures in place to initiate corrective measures are not adequately described.

EU – Germany

The Review Group notes that there is no salmon farming in Germany. All wild salmon stocks were extinct in Germany by the middle of the nineteenth century and valuable efforts are now being made to restore them. Restoration stocking uses eggs imported from other European countries (i.e. from within the North-East Atlantic Commission area) or increasingly derived from adults returning to the rivers or their progeny. The aim is to become independent of foreign origin ova and some material is already obtained from returning spawners, some kelts are reconditioned and there is some captive breeding. The habitats chosen for stocking are those known to have been occupied by salmon historically or that have suitable habitat today. All salmon hatcheries require authorisation and are subject to health inspections. All ova imported from abroad require a health certificate and all material is subject to a health check before stocking.

No information has been provided in the FAR in relation to initiatives for international cooperation, burden of proof, classification and zoning, policies concerning the introduction of non-indigenous fish into salmon rivers, and procedures to initiate corrective measures. While the FAR indicates that only stocks originating from countries within the North-East Atlantic Commission area have been used in the stocking programmes no information is presented on the existence of controls on movements from outside the Commission area. No information is presented relating to introductions of non-indigenous fish and there is no information on ongoing research and data collection in support of the restoration programme.

The following issues are not consistent with NASCO's agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- the process to demonstrate prior to approval that proposed activities will not have a significant impact on wild salmon stocks is not adequately described;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- the procedures to ensure that no non-indigenous fish species are introduced into a salmon river that would have unacceptable risks of adverse impacts to the wild stocks are not adequately described;
- classification and zoning systems have not been developed;
- procedures in place to initiate corrective measures are not adequately described;
- research and development and data collection are not adequately described.

EU – Ireland

Ireland is the fifth largest producer of farmed salmon in the North Atlantic with a production in 2009 of approximately 10,000 tonnes. All aquaculture facilities must be licensed and all marine farms with a production >100 tonnes are required to produce an Environmental Impact Statement that includes potential impacts on the wild stocks. Target lice levels have been set (0.3-0.5 mature female lice per salmon) above which an increase in production would not be allowed and there is a national sea lice monitoring programme with inspection

and sampling of each year class of fish at all farm sites. In 2008, a new pest Management Strategy was developed that introduced detailed fallowing requirements and a new approach to monitoring to deal with situations where target lice levels were not being achieved. This approach will identify 'breakout' site options for sites with persistent sea lice problems. An on-going project funded under the EU Seventh Framework Programme entitled 'Project Escape' is developing an audit of escapes from fish farms but it is stated that there have been no major escapes in the last three years although small-scale losses may go undetected.

There is no commercial ranching but 'experimental' ranching is carried out in two rivers (Burrishoole and Screebe) with adult returns harvested by rod and line and by in-river traps. Clear guidance has been developed on the measures required to minimise interactions between ranched fish and wild stocks. Stocking has been carried out in Irish rivers for over a century, with the largest programmes being on rivers harnessed for hydro-power and where large-scale arterial drainage required mitigation stocking. The FAR indicates that there are twelve salmon hatcheries predominantly for enhancement on a single river using indigenous stocks. Recently, there has been a move towards stocking with later life stages rather than ova and unfed fry. For stocking purposes, the classification in the NASCO guidelines is applied. The ESOPS (Enhancement Stocks – Origin, Progress and Status) Programme has monitored all stocking activities from capture of broodstock through to release of progeny to the wild. Important research into the relative fitness of wild, farmed and ranched salmon was conducted in Ireland and recent experiments suggest that more caution is required before releasing hatchery-reared progeny to the wild. Educational material is available on websites including information on *G.salaris*.

While reporting of escapes is required, little information was presented on the technical standards or on containment measures in freshwater facilities. There is no systematic monitoring for escaped farmed salmon in rivers although the proportion in fisheries is considered low. While there is a national sea lice monitoring programme on the farms and monitoring of lice on sea trout in estuaries these data are not presented in a manner that allows progress towards the international goals to be assessed. There is no information on initiatives for international cooperation other than to refer to involvement in the NASCO process. The FAR indicates that imports of salmonids have been permitted for aquaculture purposes under strict controls, including material originating from outside the North-East Atlantic Commission area.

The following issues are not consistent with NASCO's agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- procedures in place to initiate corrective measures are not adequately described.

EU – Sweden

There are major habitat issues in Swedish West Coast rivers associated with acidification and hydro-electric power (HEP) schemes but significant stock rebuilding efforts are underway including liming programmes and large-scale stocking of smolts in three rivers affected by HEP. There is no marine salmon farming although escapees originating in other countries have been detected in rivers and caused problems for the compensatory stocking programme. The parasite *G.salaris* was first detected in 1989 and now occurs in most rivers. The parasite has significant effects on the growth and condition of parr in infected rivers. There are cooperative programmes with Norway and Finland relating to this parasite and with Norway on stocking border rivers. This cooperation includes scientific cooperation related to identification of the parasite. There is only one salmon hatchery on a salmon river and ten rainbow trout farms. Stocking with salmon is restricted to local stocks from the river concerned and before any release of hatchery-reared fish a risk-benefit analysis is required. Permission for stocking with salmon is normally restricted to the ongoing national re-stocking programme, designed to compensate for lost production due to HEP generation. Any new aquaculture facilities on salmon rivers are prohibited and under a new strategy on introductions and transfers, it is recommended that habitat improvement to enhance natural regeneration of stocks should be prioritised over re-stocking.

It is not clear what protective measures relating to introductions and transfers of non-indigenous species apply in these rivers. There is no marine salmon farming in Sweden but there is no description of the containment measures employed at freshwater facilities for rearing salmon and rainbow trout. While the FAR indicates that stocking can only use material obtained from the river being stocked, no information has been provided to show that controls exist concerning the movement of salmon and non-indigenous salmonids that have originated outside the Commission area. While it is indicated that stocking with any species of salmonid is normally prohibited if the parasite *G.salaris* does not already exist in the river system, the FAR indicates that most rivers now have the parasite present. There is no description of procedures relating to the introduction of non-indigenous fish into a salmon river. The FAR indicates that the strategy to prevent the further spread of *G. salaris* is to prevent stocking of uninfected rivers and to disseminate information about the risks from the parasite but no initiatives for eradicating the parasite in infected rivers are described. Such initiatives are recommended in Annex 2 of the Williamsburg Resolution.

The following issues are not consistent with NASCO's agreements and need additional actions:

- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- the procedures to ensure that no non-indigenous fish species are introduced into a salmon river that would have unacceptable risks of adverse impacts to the wild stocks are not adequately described;
- procedures in place to initiate corrective measures are not adequately described.

EU – UK (England & Wales)

The FAR indicates that there is no saltwater farming of salmon but approximately 1.9 million salmon parr/smolts are reared annually in fresh water for on-growing in marine cages in Scotland. Rearing of juvenile salmon (~1.3 million) and small numbers of sea trout is undertaken to supply a range of mitigation, restoration and enhancement stocking programmes. There is also rearing of brown and rainbow trout, small numbers of non-indigenous species and coarse fish.

Consent is required to release fish and as part of the consenting procedure, the effects on the fisheries and the general ecology of the receiving and connected waters are considered including, fish health, fish ecology and the ecology of plants and other wildlife. Separate regulations apply if the fish are not native to the British Isles. There is a risk-based approach to authorising fish farms. All fish farm operators are required to ensure that screens are in place to prevent the entrainment of salmon or migratory trout into the farm and to prevent the egress of farmed fish from the fish farm. Compliance is assessed by regular inspections. There is a clear policy for stocking that incorporates the elements in NASCO's guidelines. Stocking of non-native species or 'kinds' of fish would very rarely be permitted in waters containing salmon and then only subject to a risk assessment demonstrating that the expected effects on the salmon stocks would be minimal. A policy of only stocking triploid (sterile) brown trout is being introduced. There are no imports of live salmon or salmon ova from other NASCO Commission areas, there is a presumption against issuing any licences to keep or release non-indigenous anadromous salmonids or to release any non-native fish in a salmon river. Research is being conducted into the impacts of intensive in-river aquaculture on wild salmonids and in developing risk assessment frameworks for non-native species. Educational materials have been developed including material related to *G. salaris* for which a contingency plan has been developed.

These procedures are consistent with the NASCO agreements and guidelines.

EU – UK (Northern Ireland)

The FAR indicates that there is only one marine salmon farm in Northern Ireland which has two sites that are ten miles apart and are stocked and harvested alternately. Production is low (138t in 2008) and because of the lack of suitable sites, it is considered unlikely that additional licences will be issued for marine salmon farms. Any new applications would be subject to an Environmental Impact Assessment and consultations. Because of the hydrodynamics of the two sites currently operated, there has been no need to carry out any treatment for sea lice. Each site is stocked with a single year-class alternately allowing a 6-week fallowing of each site. Procedures and measures have been adopted in relation to both marine sites and freshwater facilities with regard to site selection, equipment and structures, management systems and operations, and verification. With regard to introductions and transfers, movements of Atlantic salmon and non-indigenous anadromous salmonids from outside the North-East Atlantic Commission area are not permitted and stocking of salmon rivers with non-indigenous fish are prohibited. Stocking to the wild requires the use of salmon sourced from the river to be stocked except where the salmon population has been extirpated. Contingency plans have been developed for *G. salarises*, escapes and jelly fish swarms around the farms.

No initiatives for international cooperation were reported although the Review Group is aware that such initiatives exist with the Republic of Ireland and the UK. A genetic study showed that interbreeding between escaped farmed salmon and wild fish had occurred in the Glenarm River following an escape event. Changes in gene frequencies in the wild population were documented and have persisted. Data were provided on the number and percentage of farmed origin salmon in coastal fisheries (11 - 18% or 500 – 900 salmon in recent years) and in the River Bush (zero or close to zero in recent years) and lice loads on commercially caught adult salmon. However, these data are not adequate to fully evaluate progress towards the international goals. The Review Group notes the absence of information on the licensing process and that the burden of proof appears to be on the regulatory authority, not the proponent of the activity.

The following issues are not consistent with NASCO's agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- the process to demonstrate prior to approval that proposed activities will not have a significant impact on wild salmon stocks is not adequately described.

EU – UK (Scotland)

Scotland is the second largest producer of farmed salmon in the North Atlantic with a production of approximately 130,000 tonnes in 2008 from 257 active marine sites. There is also farming of rainbow trout and small scale farming of other species (char, brown/sea trout, halibut and cod). There is a presumption against any further finfish aquaculture development covering the north and east coasts of Scotland. The FAR indicates that the Scottish Salmon Producers' Organization has developed a Code of Good Practice which is currently being reviewed and updated. All salmon farmers are required to comply with this Code. Third party non-statutory audits of compliance with the Code are undertaken. Reporting of escapes is mandatory and sharing the information with wild fish interests is advised. New legislation will establish a risk-based approach to aquatic animal health surveillance. The FAR indicates that a number of controls are in place and these controls are being updated to ensure effective sea lice management, there is a process for sharing information on sea lice prevalence between fish farming companies and wild fish interests and monitoring of wild smolts is carried out by sweep netting to assess lice burdens. The Review Group welcomed the summary table indicating how each measure in the BMP Guidance is being addressed. It is an offence to introduce salmon or sea trout into waters without consent. Policy guidance has been developed to promote best practice for stocking that advocates a risk-based approach. It is an offence to introduce non-native species into the wild without a licence and there is a strong presumption against releasing non-indigenous fish into rivers containing salmon. Scotland has Additional Guarantees in relation to *G.salaris* (and BKD) and a contingency plan has been developed. Considerable efforts are being made to highlight the risks posed to the wild stocks by this parasite.

'A Fresh Start: the Renewed Strategic Framework for Scottish Aquaculture' includes six themes including healthier farmed fish and improved containment. A Containment Working Group is working to strengthen the approach to escape avoidance and it intends *inter alia* to

develop a technical standard covering production in both freshwater and marine environments and an accredited training scheme for fish farm workers. Research is ongoing into seal deterrent devices. Similarly, a Healthier Fish and Shellfish Working Group will update the current sea lice control regime by introducing a national system for publishing sea lice data, introducing threshold levels, ensuring single year-class stocking, fallowing and synchronous lice treatments and introducing statutory reporting on suspicion of sea lice resistance to therapeutants. The Review Group notes that the FAR refers to an evolution in the approach to address the impacts of salmon farming from voluntary approaches, through accredited schemes such as the Code of Good Practice to legislation and enforceable regulation.

However, the FAR does not present any data to assess if progress has been made towards achieving the international goals; this is especially true for sea lice. The current Code of Good Practice is described in the FAR as being outdated with regard to containment and it is currently being reviewed. Similarly, the Group notes that new initiatives for improved disease and parasite control are being developed but are not yet in place. The Review Group notes that imports of salmon ova from outside the Commission area occurred as recently as 2006.

The following issues are not consistent with NASCO's agreements and need additional actions:

- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented.

Norway

Norway is the largest producer of farmed Atlantic salmon in the world, with production in 2009 of approximately 846,000 tonnes and between 600 - 700 sites holding fish at any one time (~1,038 licensed sites in total in 2009). Production has quadrupled over a fifteen year period. The FAR indicates that the major concerns relate to escapees and sea lice. The Group notes some major initiatives concerning measures to minimise impacts of aquaculture, introductions and transfers. For example, 52 national salmon rivers and 29 national salmon fjords have been designated in which the establishment of new salmon farms is prohibited and existing farms have been subject to stricter regulations since 2009. In 14 fjords the existing salmon farms will be prohibited from 2011. An Action Plan on Containment, 'Vision zero escapes' was developed in 2006 with the aim of achieving its goals in two years and an extension of this plan is now being considered. The plan includes technical standards, a permanent Commission of enquiry into escape events, and education and motivation efforts. Efforts are made to recapture escapees, a method of tracing escapes to the farm of origin has been developed for use in the case of non-reporting of losses and monitoring for escapees occurs in 39 rivers. Since 2007, there has been a coast-wide (except Troms and Finnmark counties) synchronised delousing programme which becomes mandatory in 2010 and which

is intended to protect out-migrating smolts. Memoranda of Understanding concerning cooperation on sustainable aquaculture have been developed with Scotland, Canada and the US.

Norwegian wild salmon populations in 46 rivers have been severely damaged by the introduction of the parasite *G.salaris*. Treatment of *G.salaris* has been successful in 21 rivers and in 2009 an updated Action Plan was developed dealing with surveillance, prevention of spread into uninfected rivers and measures to eradicate the parasite. Gene banks (both living and cryopreserved) have been established. Stocking to the wild is restricted to the local stock and is kept to a minimum with greater emphasis on habitat protection and restoration. Salmon originating from outside the Commission area have not been introduced and it is prohibited to import and release anadromous freshwater fish.

Data were presented on the reported escapes of farmed salmon as both numbers and as a proportion of the farmed stock. Information presented in the FAR indicates that the reported number of escapees has declined, but the number remains high (175,000 in 2009). Monitoring in rivers indicates that the proportion of escaped farmed salmon in spawning populations has also declined but since 2000 it has been between 11 – 18% and shows a slightly increasing trend between 2003 - 2008. Appropriate thresholds have not been determined. A modelling study presented in the FAR predicts major changes in the composition (percentage wild origin) of the spawning run in all but two regions of Norway by 2100. Among the salmon that hatched in 1995 an estimated 75% or more came from wild parents in all regions while a century later it is predicted that < 75% will come from wild parents in all but two regions. Sea lice levels per fish were found to be three times higher in Autumn 2009 than in 2008. The data on sea lice are not adequate to assess progress towards the international goals. However, it is noted in the FAR that lice levels monitored annually on wild fish indicate that levels are significantly higher in areas with fish farms than in areas without. In response to the increased lice levels in 2009, compulsory synchronised delousing treatments are now required at new lower thresholds but a major challenge in achieving these targets to protect wild fish is the evidence of resistance to both emamectin benzoate and pyrethroid treatments, which was perhaps inevitable given the frequency of treatments.

The following issues are not consistent with NASCO's agreements and need additional actions:

- progress towards achieving the international goals for sea lice and containment was not demonstrated;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented.

Russian Federation

The FAR indicates that there are two salmon farms in the Murmansk region close to the border with Norway that use Norwegian or Scottish origin fish which are quarantined until health testing has confirmed that the material is disease-free. While production is presently a few hundred tonnes, projected production is around 23,000 tonnes. Stocking occurs in the Murmansk, Karelia and Archangelsk regions using indigenous salmon and fin clipping is used to allow evaluation of the effectiveness of the hatchery releases. There are plans to review the hatchery protocols since the effectiveness of stocking appears to be low. It is stated that there are presently no activities related to introductions and transfers and that no

non-indigenous fish are released into salmon rivers and none are planned. The hatchery releases of pink salmon, a species native to the Pacific Ocean, that started in the 1930s ceased in 2000. The parasite *G.salaris* occurs in one river in Karelia.

The FAR did not follow the format provided by the Council and the information provided was unclear in a number of places. This made it difficult for the Group to assess the FAR. No information was presented on initiatives for international cooperation, to allow progress towards achieving the international goals to be assessed, on the burden of proof or on river classification and zoning. There are no technical standards for equipment and no requirement to report escapes although farms must have a contingency plan in the event of an escape event. While interim veterinary and sanitary rules for marine farms have been developed, they have not been approved. There do not appear to be requirements for single year-class stocking or fallowing and there is no IPM. The FAR indicates that although the introductions of pink salmon have now ceased, it is not clear if controls exist to prevent future introductions. Pink salmon spawn in all rivers in the Murmansk region (supporting a fishery twice the harvest of Atlantic salmon) and the Review Group is aware the species also spawns in some Norwegian salmon rivers. The FAR does not describe any corrective measures intended to address this situation or to eradicate the parasite *G.salaris* in the infected river in Karelia.

The following issues are not consistent with NASCO's agreements and need additional actions:

- initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;
- no information is presented to allow assessment of progress towards the international goals for sea lice and containment;
- inadequate development and implementation of an Action Plan to minimise escapes;
- adequate measures to minimise the risk of disease and parasite transmission have not been implemented;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- procedures in place to initiate corrective measures are not adequately described;
- classification and zoning systems have not been developed.

USA

The remaining wild populations of Atlantic salmon in Maine have been listed under the Endangered Species Act (ESA), while rivers in which the salmon populations have been extirpated are under restoration. The salmon farming industry is located in Maine and production has increased in recent years reaching 9,500 tonnes in 2008 following a major outbreak of ISA. Management actions have been implemented through Federal, State and local measures with the most significant federal measures implemented through the ESA consultation process which has regulatory enforcement power. The FAR describes a federal agency determination that salmon farming poses the risk of adverse effects on endangered salmon populations although it is not considered likely that these will drive the species to extinction. The FAR indicates that the option to relocate the farms away from the wild

salmon rivers was considered but alternative suitable sites could not be identified. Rather the measures implemented include the use of only local North American stocks, containment measures to reduce escapes, audits and reporting requirements, prohibitions on stocking transgenic salmon and marking all salmon in marine pens. The salmon farming industry has employed a Containment Management System (CMS) at all production facilities including those in fresh water (e.g. three barrier screening at outflows). Site specific plans were developed following hazard analysis and include standard operating procedures covering, stocking and harvesting, net changes, predator control, managing unique events, record keeping, reporting of escapes and training. Monitoring of rivers for escapees is undertaken. An industry initiative, the Finfish Bay Management Agreement applies to all US companies in Cobscook Bay and certain Canadian companies and has led to better coordination of site fallowing, fewer overlapping year classes in production and reduced disease transmission between year classes. In addition an Integrated Pest Management Programme is a requirement of the ISA programme and includes monitoring of sea lice levels and evaluating treatment efficiency. Thresholds for lice treatment have been established.

With regard to stocking, in Maine only local river specific stocks are used and standard mating protocols including screening for farmed salmon are applied. A gene bank has been established but is not described.

Data is presented on the occurrence of escaped farmed salmon in five rivers which shows that few escapees have been detected in recent years. However, the data presented is not adequate to allow an assessment of progress towards achieving the international goal for containment and no information is presented in relation to assessing progress in relation to the goal for sea lice. The FAR indicates that deliberate, authorized introductions of non-indigenous anadromous salmonids into the US North American Commission area do not occur but introductions of non-indigenous salmonids with the potential to become anadromous do occur. While imports of all salmonids into the US are controlled by federal salmonid importation regulations, these seek to minimize the spread of diseases and do not address ecological interactions. The FAR indicates that prohibitions on stocking non-indigenous fish into rivers containing Atlantic salmon are not in place and procedures for evaluating the impacts on wild salmon only exist in the case of federally supported programmes. The Group recognises that a requirement to mark all farmed salmon was introduced in 2009 which will allow identification of the source of escapes so corrective measures can be taken. A permanent weir is in place on one river but it is not clear how the temporary weirs would be used to initiate corrective measures on the other rivers.

The following issues are not consistent with NASCO's agreements and need additional actions:

- no information is presented to allow assessment of progress towards the international goals for sea lice and containment;
- adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented;
- the procedures to ensure that no non-indigenous fish species are introduced into a salmon river that would have unacceptable risks of adverse impacts to the wild stocks are not adequately described;
- procedures in place to initiate corrective measures are not adequately described.

IP(10)32

NGO Statements to the Review Group

The following statements were made by the NGO Group but did not find unanimous support from the rest of the Review Group.

Application of NASCO's principles

- The NASCO Convention applies to the North Atlantic but not to other areas where Atlantic salmon are farmed in marine and freshwater habitats where they are non-native. However, when a country has agreed to the principles of NASCO, including the principles of the Williamsburg Resolution, it would be consistent and strongly advisable that they apply these principles to other areas of their respective countries that are not in the NASCO Convention Area and are not native habitat for Atlantic salmon. In particular, they should adhere to the principle discouraging the introduction of non-native salmon or salmonid species that might interfere with native salmon or salmonid species. For example, escapes from Atlantic salmon aquaculture along the Pacific coast of North America have led to such introductions.
- Companies from one NASCO country operating in another country should meet the national standards for salmon aquaculture operations in their home country as well as the country in which they are operating.
- The NGOs note that in some jurisdictions management and regulation of both salmon farming and the wild stocks are the responsibility of different government departments while in others they are the responsibility of the same department. The NGOs consider that separating the management and regulation of salmon farming from that for wild salmon could help avoid any conflicts of interest that may occur when the two sectors are managed within the same department. While this is a matter for individual jurisdictions, the NGOs observed that at NASCO the primary responsibility of the jurisdictions is the conservation of wild salmon through adherence to the Williamsburg Resolution and implementation of the BMP Guidance, rather than placing wild stocks at risk by accommodating the commercial demands of the salmon farming industry.

Need for enforcement

- The NGOs recognise the need for rigorous enforcement linked to failures highlighted by monitoring and the need for legislation to enable closure or relocation of farms failing to achieve satisfactory sea lice levels or experiencing escape events or other significant losses. Strong and enforceable standards for lice levels and escapes/losses are essential and should be established on the basis of effects on wild salmon and should be consistent with best available independent scientific advice and rapidly adaptive to changes in that advice.

Presumption against farming

- NASCO's agreements aim to minimize the possible threats from adverse impacts of salmon aquaculture, introductions and transfers and transgenics on the wild stocks. As noted by the Task Force, the general principle should be that wild salmon stocks in areas with fish farming should be as healthy as those in areas without fish farms. Salmon farming is certainly not the only threat to wild salmon stocks, but the NGOs believe the impact is threatening enough that salmon farming and wild stocks are best kept well separated if the wild stocks are to flourish. In addition, there should not be a presumption that aquaculture is compatible with healthy wild salmon populations, as there seems to be in most jurisdictions. It is, instead, recommended that there be a presumption against salmon farming in all coastal waters in the vicinity of salmon rivers, particularly where a jurisdiction has populations of salmon and specific rivers designated under conservation legislation. Exclusion zones should be established based on best available independent scientific advice (i.e. not in-house studies by paid consultants). Furthermore, the NGOs consider that there should be a presumption against any freshwater salmonid aquaculture in river catchments (including lakes) containing a wild population of migratory salmonids.

Issues not addressed in the Williamsburg Resolution

- The NGOs consider that there are issues, particularly concerning salmon farming activities that are not adequately addressed in the Williamsburg Resolution or the BMP Guidance. For example, there should be a clear recognition that assessment of the impacts of salmon farms on the wild stocks should be an essential component of the pre-approval process and for determining the continuing existence or expansion of sites. In this process, risk assessment has been identified as a key tool, but it should be clear that it is no more than that. Risk assessment, in itself, is not precautionary but it can organize information in a way that assists in making precautionary decisions. Other information is often appropriate as well. A better definition of risk assessment would provide guidance on how to apply it (e.g. using it to decide which farms don't have to be monitored is far from precautionary and far from useful in protecting wild salmon). The option of down-sizing, relocating or eliminating salmon farms should also be considered as a possible corrective measure where problems are identified or in response to changes in wild stock abundance. In general, it is important to identify in advance possible threats that may occur to the wild stocks from salmon farming and how best to avoid them or respond to them when they arise. Moving salmon farms offshore should not be viewed as a means of avoiding the need for limiting development. The need for assessment of impacts on wild stocks is just as important for offshore farms as it is for coastal farms. The increasing ratio of farmed salmon to wild salmon populations is a growing concern and must be considered in the pre-approval assessment.
- The scale and rate of growth of salmon farming development are not, but should be, addressed in the Williamsburg Resolution, with guidelines for setting limits to growth ahead of time. More emphasis is needed on the importance of monitoring that can accurately assess the impact on populations of wild salmon in both the marine and freshwater environments. Apparently guidance is needed as most jurisdictions have not succeeded in establishing reliable and thorough monitoring programmes. International guidance is also needed on what conditions should trigger decisions to

relocate, limit growth or reduce density and capacity of salmon farms in a region. This is not just an issue within national boundaries. Salmon in distant ocean waters can and may already be severely impacted by salmon farming in coastal waters. It is also essential that the potential impact of large-scale offshore farming, which looms in the future and could impact wild salmon stocks, be assessed before it is permitted to proceed. Marine spatial planning is being explored or undertaken by many jurisdictions. Mariculture, including salmon farming, should figure prominently in these deliberations, including if and where it is an appropriate activity and its compatibility or incompatibility with other maritime activities. Overall, it is essential that in applying the Precautionary Approach to aquaculture and introductions and transfers, the population status, genetic diversity, and health of the wild salmon are taken into full account. This applies whenever jurisdictions are making decisions about permitting and location of facilities.

- The NGOs, therefore, recommend that NASCO considers developing a more detailed protocol for Atlantic salmon farming to augment (not replace) the Williamsburg Resolution and provide standards for achieving the goal of negligible harm to wild salmon populations.

Issues not addressed in the FARs

- The NGOs note that several of the FARs from jurisdictions with salmon farming omitted some information or procedural knowledge that is publicly available and is known to the NGOs in those jurisdictions. With those omissions the FARs appeared to present a more favourable picture than the actual situation with regard to the impacts of salmon farming on the wild salmon stocks or on efforts to avoid such impacts.

IP(10)34

*Responses from Parties to the Review Group's Draft Report***Canada**

- Canada's Focus Area Report (FAR) on Aquaculture, Introductions and Transfers, and Transgenics provided a summary of the regulatory and management processes of Canadian aquaculture, introductions and transfers (I&T), and transgenics, and of the measures taken to minimize their impacts on wild salmon stocks. The information in the FAR clearly demonstrated a strong legislative, regulatory, and policy environment, as well as effective collaboration between government, industry, and nongovernmental groups, for conservation and management of wild Atlantic salmon.
- Canada has made clear and demonstrable progress on pest management, containment, fish health and introductions and transfers through the development and implementation of various programs, policies, regulations, and practices that are consistent with NASCO guidelines. Canada is committed to continuous improvement and to working towards international goals on issues such as sea lice management and containment.
- Canada (both the federal and provincial governments and industry) is very active internationally and works both bilaterally and as a member of various international bodies to ensure the sustainability of the aquaculture sector. This clearly shows Canada's commitment to international cooperation to minimise adverse impacts on wild stocks.
- Canada has made significant progress towards achieving the international goals for sea lice and containment as defined by the *Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks* by taking an integrated pest management approach and ensuring that all aquaculture sites in Canada have sea lice monitoring and management plans and containment protocols in place.
- While at times dealing with diseased animals, Canada's fish health management system is predicated on a proactive approach to husbandry that prevents the manifestation of disease. Extensive clinical support, on-farm visitation and local knowledge support their efforts to maintain the health of farmed salmon, as well as to preclude ecological impacts.
- Canada is currently undertaking legislative change to implement its responsibilities for aquatic animal health with the development of the National Aquatic Animal Health Program (NAAHP), which is similar to Canada's established and internationally recognized terrestrial animal health program.
- Canada has been at the forefront of developing and implementing the Bay Management Approach, which has been proven around the world to be an effective tool for fish health and parasite management by interrupt pathogen cycles through regular fallowing measures, ensuring that the risk of disease and parasite transmission is minimized. A Bay Management Approach is currently used in New Brunswick and Newfoundland, while Nova Scotia is currently looking into its viability.

- Breaches in containment are uncommon in Canada despite increasing numbers of salmon being farmed in Eastern Canada. All provinces which have net-pen farming of Atlantic salmon have Standard Operating Procedures for containment on salmon farms that specifies cage system design standards and mandatory reporting of escapes. This is consistent with NASCO's Guidelines on Containment of Farm Salmon (Annex 3 of the Williamsburg Resolution).
- Potential breaches in containment are also preemptively addressed within Canada's National Code on Introductions and Transfers from an ecological impact perspective and form part of the risk assessment based decision making process before any stock is moved to a particular site.
- Canada proactively controls movements of Atlantic Salmon and non-indigenous salmonids into Canada through its National Code on Introductions and Transfers, which was endorsed by the federal and provincial governments and implemented in 2003.
- As outlined in Canada's FAR, the Code allows us to proactively determine the potential disease, ecological and genetic risks associated with all introductions and transfers and to mitigate risks where appropriate. This internationally recognized approach ensures that the risk of disease and parasite transmission is minimized and that movements of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes are strictly controlled.
- Canada does not prescriptively classify salmon rivers as to their potential sensitivity to aquaculture escapement and introductions and transfers. Rather, every introduction and transfer is assessed within the Code's risk assessment process relative to the ecological impact of potential escapement before an introduction or transfer is permitted (whether for aquaculture purposes or other). Permits are only issued when risks are deemed acceptable (i.e. low risk) to the recipient jurisdiction.

Draft Response Document on the NASCO FAR Review Group Draft Report

List of Appendices:

1. National Aquaculture Sea Lice Pest Management Framework
2. Bay Management Plan Overview Document
3. National Aquatic Animal Health Program (NAAHP) Overview
4. Southwestern New Brunswick Code of Containment for Atlantic Salmon (separate pdf)
5. The New Brunswick Breach of Containment Governance Framework for Marine Salmon Farm Operations (separate pdf)
6. Newfoundland Salmonid Code of Containment (separate pdf)
7. National Code on Introductions and Transfers of Aquatic Organisms
8. Canada-U.S. MOU on Introductions and Transfers

Introduction

Canada's Focus Area Report (FAR) on Aquaculture, Introductions and Transfers, and Transgenics provided a summary of the regulatory and management processes of Canadian aquaculture, introductions and transfers (I&T), and transgenics, and of the measures taken to minimize their impacts on wild salmon stocks. The information in the FAR clearly demonstrated a strong legislative, regulatory, and policy environment, as well as effective

collaboration between government, industry, and nongovernmental groups, for conservation and management of wild Atlantic salmon. However, in response to the FAR Review Groups Draft Report, Canada has prepared this supplemental report to respond directly to the seven comments made on Canada's FAR. This report aims to more adequately describe how Canada meets each of the elements of the Williamsburg Resolution and to demonstrate the progress made towards the international goals for sea lice management and containment. Canada welcomes this opportunity to contribute to Council's Focus Area Review on Aquaculture, Introductions and Transfers, and Transgenics and is hopeful that this report is useful for clarification on issues that were raised. Canada has made clear and demonstrable progress on pest management, containment, fish health and introductions and transfers as shown by the descriptions of various programs, policies, regulations, and practices provided in our FAR and herein. Canada is committed to continuous improvement and to working towards international goals on issues such as sea lice management and containment. It is important to note that in Canada aquaculture is an area of shared jurisdiction between the federal, provincial and territorial governments. The federal, provincial and territorial governments work collaboratively with the Canadian aquaculture industry to ensure the sustainable development of the aquaculture sector in Canada.

1. Initiatives for international cooperation to minimize adverse impacts on wild stocks were not adequately described.

Canada (both the federal and provincial governments, and industry) is very active internationally and works both bilaterally and as a member of various international bodies to ensure the sustainability of the aquaculture sector. Specific examples of direct engagement include:

- Ongoing and direct participation in the ISFA/NASCO Liaison Group and the North American Commission (NAC) of NASCO;
- Active participation in ISO TC234 Fisheries and Aquaculture and its associated working groups;
- Ongoing and direct participation in the WWF Salmon Aquaculture Dialogues;
- Active participation in the FAO-COFI Subcommittee on Aquaculture;
- Participation in the international sea lice research workshop hosted by Norway in February 2010;
- Hosting of two international workshops on sea lice in New Brunswick in the fall and winter of 2009-2010 that brought together researchers, industry and fish health experts from around the world and helped develop the framework for an Integrated Pest Management Plan and a supporting research program; and
- Hosting of an international sea lice conference in British Columbia in May: Sea Lice 2010 that brought together experts from industry, government and science from around the world;

Bilaterally, Canada has regular dialogues with other salmon producing countries, particularly Scotland and Norway, on areas of common interest such as certification, fish health management and regulatory initiatives. These discussions, and the resulting relationships, allow for information and knowledge to be shared and joint initiatives to be undertaken to ensure continued improvement of the aquaculture sector around the world.

With respect to Introductions and Transfers (I&T), at the Council's 22nd Annual Meeting in Vichy, France, North American Commission [NAC] member nations signed a **Memorandum of Understanding on Introductions and Transfers [NAC (05)7]**. This

document outlines Canada's commitment to using its **National Code on Introductions and Transfers (The Code)**. The Code requires notification between jurisdictions in the same watershed that may be affected by a proposed introduction or transfer. Through the NAC, Canada and the U.S. are currently developing a new reporting protocol to ensure that information sharing occurs in an appropriate manner. This protocol should be formally implemented in 2011, though many of the elements are already in place through other mechanisms. In addition to NASCO reporting measures, Canada also utilizes the reporting measures specified in the Code, which includes a commitment to notify neighbouring jurisdictions of any I&T occurring in shared watersheds. These initiatives are clear examples of Canada's commitment to international cooperation to minimise adverse impacts on wild stocks.

2. Progress towards achieving the international goals for sea lice and containment was not demonstrated.

As described below, and in Canada's FAR, Canada has made significant progress towards achieving the international goals for sea lice and containment as defined by the *Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks*.

Canada takes an integrated pest management approach and all aquaculture sites in Canada have sea lice monitoring and management plans in place. Until recently, significant sea lice loads were the exception versus the rule industry-wide in Canada; management of the industry is continuously evolving to address new developments and challenges. Currently, provincial and federal governments and industry are working collaboratively to refine the **Integrated Pest Management Plans (IPMPs)** developed for salmon farms. These Plans are site specific and can incorporate site fallowing, bay management, therapeutants, and/or other measures. This proactive refinement is consistent with good farm husbandry practices while remaining sensitive to the ecology of the local area. In addition, DFO, in collaboration with the provincial governments and the aquaculture industry have developed a "**National Aquaculture Sea Lice Integrated Pest Management Framework**" which outlines the key components to be considered when developing or refining regional (provincial) Sea lice IPMPs. These advancements show obvious progress towards achieving the international goal of "100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms."

Fish health management on salmon farms in Eastern Canada is under the authority of both government (federal and provincial) and industry veterinarians. While at times dealing with diseased animals, the fish health management system is predicated on a proactive approach to husbandry that prevents the manifestation of disease. Extensive clinical support, on-farm visitation and local knowledge support their efforts to maintain the health of farmed salmon, as well as to preclude ecological impacts. Examples of this approach include a spectrum of activities ranging from recommendations on rearing density to the full scale imposition of Bay Management Plans, which interrupt pathogen cycles through regular fallowing measures. These measures help to ensure that the risk of disease and parasite transmission is minimized. Bay Management has been proven around the world to be an effective tool for fish health and parasite management; Canada has been at the forefront of developing and implementing these systems. The box below describes the Bay Management Areas Programs currently in place in New Brunswick and Newfoundland and Labrador.

Box 1: Summary of the Bay Management Area Programs in New Brunswick and Newfoundland and Labrador.

New Brunswick

The Bay Management framework in Southwest New Brunswick was developed in cooperation with industry and governments to facilitate fish health management in the region. The main components of the framework include a reduction of the management areas from 21 to 8 and extension of the production cycle at each farm from 2 to 3 years, including a mandatory fallow period.

Farms in each Aquaculture Bay Management Area are now stocked every third year which allows for true single year class farming and fallow periods. Each site has a minimum four month fallow, while the whole Aquaculture Bay Management Area has a concurrent two month fallow period before restocking occurs.

The designation of these areas was based on a three-year production cycle on the principle that, to ensure the sustainability of the industry, the marine site production system framework must provide an operational environment which enables industry to service markets on a year round basis without compromising fish health management, biosecurity requirements, or the environmental integrity of coastal waters. In addition, the number of farms active at any given time in an area is lower.

Single year class farming and fallowing breaks the pathogen-host cycle and the life-cycle of pests such as sea lice. Since the implementation of Bay Management Area Program, there have been no instances of Infectious Salmon Anemia (ISA), and the management and treatment of sea lice infestations have been greatly facilitated.

Newfoundland and Labrador

Newfoundland currently has a 3-site system with a minimum of 1 km site separation in place. This system requires that each operator have at least three sites to allow for true year class separation and a 12 month fallow period between production periods. However, due to the development of the industry in Newfoundland in recent years, the province is proactively developing a new integrated aquaculture management regime that will encompass fish health, environmental management and production management. Implementation of a Bay Management Program, similar to that in Southwest New Brunswick, is anticipated.

Nova Scotia

Nova Scotia is currently considering the development of a bay management program.

Breaches in containment are uncommon despite increasing numbers of salmon being farmed in Eastern Canada. Through regulation, condition of licence, or operating agreement, regulatory agencies are notified of a breach in containment and, dependent upon the circumstance, the application of recapture procedures may also apply. Atlantic salmon are farmed in three of five provinces in Eastern Canada - New Brunswick, Nova Scotia, and Newfoundland and Labrador – all of which have developed **Standard Operating Practices** on containment on salmon farms, including the establishment of cage system design standards that ensure containment and mandatory reporting. This is consistent with the Guidelines on Containment of Farm Salmon (Annex 3 of the Williamsburg Resolution) and the conclusion by the FAR review group that while a single document would be desirable, that would not be necessary to be consistent with the guidelines (s. 5.13). The box below describes the approach taken by each province with respect to containment:

Box 2: Summary of the containment approaches in New Brunswick, Nova Scotia and Newfoundland and Labrador.

New Brunswick - The New Brunswick Salmon Growers Association has developed the *Code of Containment for the Culture of Atlantic Salmon in Marine Net Pens in New Brunswick*, and with the federal and provincial governments, have endorsed the *Southwest New Brunswick Breach of Containment Governance Document* which details responsibilities and reporting requirements in the event of a containment breach. The Code includes a set of Standard Operating Practices (SOPs), provisions specific to the marine site location and infrastructure, and requires a documented maintenance, inspection, and auditing processes. The Code and Governance Document outlines the requirements and process for establishing a contingency plan, the process for reporting escapes and the reporting requirements which include mandatory investigation and mitigation responses. The Code of Containment and Governance Document will be supported by changes to current regulations under the New Brunswick Aquaculture Act. Prior to these documents being developed, companies complied on a voluntary basis and this will continue until the changes to regulation occur. Through the NAC, both Canada (New Brunswick) and the U.S. have agreed to inform the other when breaches of containment occur in their respective jurisdictions.

Nova Scotia - Immediate reporting of all breaches to net pens and appropriate efforts to recapture all escaped stock are requirements of licence under the Nova Scotia Fisheries and Coastal Resources Act, Aquaculture Regulation. Salmon net pen companies operating in Nova Scotia have adopted the standards and practices specified in the NBSGA Code of Containment.

Newfoundland and Labrador - Newfoundland and Labrador's Code of Containment for the Culture of Salmonids (1999) is a condition of the finfish aquaculture license. The Code describes equipment and fish handling standards, contingency measures for predator management and recapture, auditing and inspection provisions, and industry reporting requirements. The provincial government conducts bi-annual inspections of all net-cage and surface mooring components and periodic audits of cage systems. A fundamental component of the Code is an annual reporting and review process. The Code requires regulatory notification in the event of breaches, as well as contingency plans for recapture and mitigation.

Potential breaches in containment are also preemptively addressed within Canada's **Code** from an ecological impact perspective and form part of the risk assessment based decision making process **before** any stock is moved to a particular site. Biological risk from potential escapement is reviewed and must be deemed acceptable (i.e. low risk) for the introduction and transfer activity to be permitted. These examples show clear progress towards the international goal of "100% farmed fish to be retained in all production facilities".

3. Inadequate development and implementation of an action plan to minimize escapes.

Canada has made clear progress on the development and implementation of Action Plans to minimize escapes and to meet international goals for containment. Atlantic salmon are farmed in three of five provinces in Eastern Canada - New Brunswick, Nova Scotia, and Newfoundland and Labrador – all of which have developed **Standard Operating Practices** on containment on salmon farms, including the establishment of cage system design standards that seek to eliminate potential breaches of containment and mandatory reporting.

Breaches in containment are uncommon despite increasing numbers of salmon being farmed in Eastern Canada. Through regulation, condition of licence, or operating agreement, regulatory agencies are notified of a breach in containment and, dependent upon the circumstance, the application of recapture procedures may also apply. This is consistent with the Guidelines on Containment of Farm Salmon (Annex 3 of the Williamsburg Resolution) and the conclusion by the FAR review group that while a single document would be desirable, that would not be necessary to be consistent with the guidelines (s. 5.13). Please refer to **Box 2**, above, which describes the approach taken by each province with respect to containment.

Potential breaches in containment are also preemptively addressed within Canada's **Code** from an ecological impact perspective and form part of the risk assessment based decision making process **before** any stock is moved to a particular site. Biological risk from potential escapement is reviewed and must be deemed acceptable (i.e. low risk) for the introduction and transfer activity to be permitted.

4. Adequate measures to minimize the risk of disease and parasite transmission have not been implemented.

Canada has been a leader in emerging aquatic animal health issues having federal regulations enacted since 1978 to minimize the risk of disease and parasite transmission. Today, Canada uses an **Integrated Pest Management** approach to dealing with parasites common to coastal fishes, especially sea lice affecting salmon farms in Atlantic Canada.

Until recently, significant sea lice loads were the exception versus the rule industry-wide in Canada; management of the industry is continuously evolving to address new developments and challenges. Currently, provincial and federal governments and industry are working collaboratively to refine the **Integrated Pest Management Plans (IPMPs)** developed for salmon farms. These Plans are site specific and can incorporate site fallowing, bay management, therapeutants, and/or other measures. This proactive refinement is consistent with good farm husbandry practices while remaining sensitive to the ecology of the local area. In addition, DFO, in collaboration with the provinces and the aquaculture industry have developed a "**National Aquaculture Sea Lice Integrated Pest Management Framework**" which aims to outline the key components that should be considered when developing or refining regional (provincial) sea lice IPMPs. In addition, all salmon farming activity meets the stringent requirements of Canadian federal and provincial legislation (over 73 pieces of legislation, most of which is environmental protection oriented).

Fish health and pest management also form an integral part of the risk assessment decision making mechanism in the Code.

Canada is currently undertaking legislative change to implement its responsibilities for aquatic animal health with the development of the National Aquatic Animal Health Program (NAAHP), which is similar to Canada's established and internationally recognized terrestrial animal health program. That this innovation has occurred within a multiplicity of jurisdictions and interests supports the notion of common interest among all parties in Canada.

Fish health management on salmon farms in Eastern Canada is under the authority of both government (federal and provincial) and industry veterinarians. While at times dealing with

diseased animals, the fish health management system is predicated on a proactive approach to husbandry that prevents the manifestation of disease. Extensive clinical support, on-farm visitation and local knowledge support their efforts to maintain the health of farmed salmon, as well as to preclude ecological impacts. Examples of this approach include a spectrum of activities ranging from recommendations on rearing density to the full scale imposition of Bay Management Plans, which interrupt pathogen cycles through regular fallowing measures. These measures help to ensure that the risk of disease and parasite transmission is minimized. Bay Management has been proven around the world to be an effective tool for fish health and parasite management; Canada has been at the forefront of developing and implementing these systems. Please refer to **Box 1** which describes the Bay Management Areas Programs currently in place in New Brunswick and Newfoundland and Labrador.

5. Adequate measures to control movements into a Commission Area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented.

Canada proactively controls movements of Atlantic Salmon and non-indigenous salmonids into Canada through its National Code on Introductions and Transfers, which was endorsed by the federal and provincial governments and implemented in 2003.

The purpose of the Code is to provide uniform guidelines for reviewing applications for licences to introduce or transfer live aquatic organisms into or within Canada and for assessing associated disease, ecological or genetic risks. The Code incorporates sophisticated risk assessment tools and codified procedures which have been recognized internationally (e.g. International Council for the Exploration of the Sea) as being best practice.

As outlined in Canada's FAR, the Code allows us to proactively determine the potential disease, ecological and genetic risks associated with all introductions and transfers and to mitigate risks where appropriate. The Code provides a consistent approach to ensuring that only I&Ts deemed as low risk are permitted to occur. This internationally recognized approach ensures that the risk of disease and parasite transmission is minimized and that movements of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes are strictly controlled.

At the Council's 22nd Annual Meeting in Vichy, France, North American Commission [NAC] member nations signed a Memorandum of Understanding on introductions and transfers [NAC (05)7]. That document outlines Canada's commitment to using The Code. Decisions associated with the importation of "*reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes*" from outside the North American Commission area are very rare. They would involve the imposition of special containment requirements to meet the Risk Assessment mitigation requirements of the Code to reduce risk to a level acceptable to the recipient jurisdiction. Absence of recent reports may be an indication of the rarity of the action.

6. Classification and zoning systems have not been developed.

Canada does not prescriptively classify salmon rivers as to their potential sensitivity to aquaculture escapement and introductions and transfers. Rather, **every** introduction and transfer is assessed within the Code's risk assessment process relative to the ecological impact of potential escapement **before** an introduction or transfer is permitted (whether for

aquaculture purposes or other). Permits are only issued when risks are deemed acceptable (i.e. low risk) to the recipient jurisdiction.

Procedures in place to initiate corrective measures are not adequately described.

Consistent with the management of most of its fisheries, jurisdictional mandate dictates the manner in which local situations are addressed in Canada. The nature of our governance system sometimes manifests itself in jurisdictions undertaking a variety of approaches to achieve the same goal. While that diversity (i.e. the absence of a consistent approach) does create variations in methodology, it does not necessarily suggest inadequacy in dealing with the situation locally.

Experience has shown this local adaptive management has generated a more effective approach than the initially envisioned prescriptive “consistent approach”.

Canada continues to work with all parties to insure the intent of the measures is met and that we protect the ecological integrity of our aquatic environments.

Conclusion

Aquaculture, like any other industry, is constantly evolving over time. The development of new technologies, policies, regulations, procedures, etc. will all have an impact on how the industry develops. In Canada, we are working on a multitude of programs that feed into this, such as the development of sector strategies, certification programs, regulatory renewal, fish health management, and alternative technologies. Each of these, and others not mentioned, contribute to the continuing sustainable development of the aquaculture sector. From a practical perspective, work priorities are based upon the immediate needs of the sector and in the near term this requires a clear focus on the sustainability of ocean net-pen culture of Atlantic salmon.

Canada notes that the objective of NASCO is to conserve, restore, enhance and rationally manage Atlantic salmon through international cooperation taking account of the best available scientific information, and continues to be committed to the spirit of that intent. Canada applies ecologically, precautionary, and risk-based management approaches to all fishery management sectors, including aquaculture. This approach best meets our needs in the sustainable management of our fisheries resources, and although it may not seem as prescriptive as the Williamsburg Resolution, it is in-line with the spirit of Williamsburg and achieves the same objectives as demonstrated in Canada’s FAR and this supplemental report.

Faroe Islands

The Faroe Islands thanks the Review Group for their comprehensive work in preparing the Draft Report on Aquaculture, Introductions and Transfers and Transgenics Focus Area Review issued by NASCO April 9, 2010.

Since the salmon aquaculture industry can be one of the major challenges in the protection of the wild salmon this work has generally been a fruitful process in order to ensure transparency in the Contracting Parties’ fulfilment of the NASCO aquaculture measures.

However the process could have been simplified and streamlined if the Contracting Parties had been provided with a form which listed the areas that were expected to be included in the FARs.

This would have helped both the Contracting Parties as well as the Review Group.

In the assessment of the Focus Area Reports the process would have benefitted from a better understanding in the review group of the very different situation in the member countries regarding the distribution and condition of wild salmon as well as the size and importance of the aquaculture industry.

More specifically the Faroe Islands have the following comments regarding the assessment of the Faroese Focus Area Report:

Protection of the wild salmon is an international responsibility. Since the salmon aquaculture industry is seen as one of the major challenges to the wild salmon stocks it is the responsibility of all nations with an aquaculture industry to minimize the negative impacts of the aquaculture industry on the wild salmon stocks.

Due to the fact that there are no self-supporting wild salmon stocks in Faroese rivers, incorporating the elements in the Guidance on Best Management Practices and the Williamsburg Resolution in many cases is not relevant in the context of Faroese aquaculture control, monitoring and risk management.

However the Faroese waters are important feeding grounds for wild salmon. Therefore, the most important measure in the Faroese aquaculture industry in the protection of the wild salmon is to prevent disease outbreaks and minimise escapes. The international goal in the Best Management Practices states that 100% of the farmed fish should be retained in all production facilities. This is an unrealistic goal, since accidents will inevitably occur to some extent.

The Faroe Islands is the third largest producer of farmed salmon in the North Atlantic. The value of farmed fish exports corresponds to around 35% of the total value of Faroese exports. Therefore it is of immense importance to the Faroese government that the regulation and control of fish farming ensures a healthy and competitive aquaculture industry in the Faroe Islands. In addition, it is central to have in mind that it is very much in the interest of the aquaculture industry to minimize the amount of escapes as well as preventing outbreak of diseases since these are risks that threaten the revenue base of the companies.

The following areas, highlighted in the assessment of the Faroese FAR, need further elaboration:

Equipment:

All fish farming equipment and facilities must be built and installed with the adequate strength and other properties necessary to ensure responsible operations in accordance with the legislation and they should be used with the necessary care and precaution. (Act of Parliament No. 83 from 2009 on fish farming)

All fish farming facilities must be approved by the Food and Veterinary Agency (Executive order no. 134 from 2009 on disease prevention procedures in fish farms).

Contingency Plans:

All fish farms must have a contingency plan which describes potential risks and preparedness e.g. escapes and outbreak of diseases. The contingency plans must be approved by the Food and Veterinary Agency (Executive order no. 134 from 2009).

Monitoring:

The Fish and Animal Disease Department in the Food and Veterinary Agency monitors health status through all stages of production, from broodstock, egg, fry, smolt to the ready-to-harvest fish, based both on monthly health status and biomass reports, as well as on-site inspections.

Every month all fish farmers must register a range of information in a common governmental electronic system e.g. number of sea lice and number and reasons for escapes (Executive order no. 134 from 2009).

Corrective measures:

A licence issued by the Food and Veterinary Agency is required in order to build, prepare, restructure, expand, buy or operate a farm intended for the rearing of fish. An overview of fish farming sites can be seen [here](#).

The consequence of repeated or grave violations of the provisions in the regulatory framework may lead to withdrawal of the licence, a fine or imprisonment (Act of Parliament No. 83 from 2009 on fish farming).

EU - UK(Scotland)

Thank you for the opportunity to comment on the draft report of the Focus Area Review Group on Aquaculture, Introductions and Transfers and Transgenics. This letter represents the Scottish Government's consolidated response.

Taking in turn the issues raised by the group:

Progress towards achieving the international goals for (i) sea-lice and (ii) containment was not demonstrated

- (i) The FAR explained that Scotland is moving toward a national system for the publication of sea-lice data (aggregated over 6 areas), providing publicly available information on prevalence for the first time. Site specific data will continue to be available locally, and the aquaculture industry has established a sophisticated system for the sharing of sea-lice and treatment data amongst the industry in order to improve coordination area-wide treatments. We expect that will support better control and so even lower levels of sea-lice than have been seen hitherto.

The Scottish Government also intends to introduce a system of reporting to Marine Scotland of sea-lice resistance to treatments, and of mortality events above defined thresholds.

- (ii) The aquaculture industry in Scotland is on course to achieving the lowest levels of escapes since public reporting began in 2002, with a precipitous decline in salmon

escapes. This will be a great achievement assuming no significant escapes in the next two months, reflecting well on the efforts of the industry, and of our Containment Working Group, established in 2009. See the table below for the relevant statistics.

Inadequate development and implementation of an Action Plan to minimise escapes

This is perhaps the most difficult of the group's comments for us to understand. The Scottish Government's Containment Working Group is:

- Developing a statutory engineering standard for fish-farms, covering marine and freshwater;
- Developing accredited training for fish-farm workers to minimise human error, for example covering net handling;
- Supporting a "road-show" involving the relevant Scottish equipment suppliers (nets, cages, moorings) to better explain to farmers in the main production areas how to use kit in the correct combinations;
- Commissioning an assessment of freshwater smolt production and its impacts; and
- Investing in research into deterrent devices for seals and into seal behaviour in the vicinity of fish farms.

The escapes statistics for 2010 appear to show that this concerted effort is now paying dividends.

Adequate measures to minimise the risk of disease and parasite transmission have not been implemented

This comment suggests that the group has taken no account of the Healthier Fish Working Group and its request to Scottish Ministers that the current regulatory system be strengthened through the creation of a statutory obligation to enter into Farm Management Agreements (FMAs) to ensure synchronised approaches to farming across marine areas. We believe that this major development should be recognised by the group in light of the benefits it will certainly bring.

Adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented.

All imports must meet the minimum health certification requirements as laid out in the legislation. In 2006 third country imports were not harmonised within the EU and to import into the UK a health certificate and licence was required. Now that 2006/88/EC has been fully implemented a licence is no longer required, but the consignment must be accompanied by a health certificate as per Annex IV of regulation 1251/2008 and from a country listed in Annex III of that legislation. We do not believe we have the right to refuse entry to consignments that have been appropriately health certified unless we have reason to believe that there may be an undeclared disease issue.

I trust that this response will be of use to you and the group. We believe that it is important to the credibility of this process that progress be recognised where it has occurred or where government commitment to specific changes has been made.

SCOTLAND CONFIRMED FARMED FISH ESCAPES 2002-2010

Number of Fish/ Number of Incidents

NOT INCLUDING ESCAPE INCIDENTS WHERE NO FISH WERE LOST

	TOTAL	TOTAL	TOTAL	TOTAL
Year	Atlantic salmon	Rainbow trout	Other **	All Species
2002	309,996 (8)	80,000 (1)	0 (0)	389,996 (9)
2003	151,853 (13)	1,560 (1)	8,025 (2)	161,438 (16)
2004	90,593 (10)	0 (0)	10,000 (1)	100,593 (11)
2005	877,883 (19)	7,970 (3)	15,800 (1)	901,653 (23)
2006	155,653 (20)	36,866 (4)	12,230 (1)	204,749 (25)
2007	154,466 (12)	56,151 (7)	26 (2)	210,643 (21)
2008	58,641(8)	10,690 (7)	3,700 (1)	73,031 (16)
2009	131,971(9)	8,591 (6)	0(0)	140,562 (15)
2010*	11,185(4)	19,976(3)	0(0)	31,161(7)

Points to note:

- 1 Statutory reporting introduced May 2002
- 2 Major winter storm in January 2005.
- 3 Code of Good Practice operational from January 2006.
- 4 **Other inclusive of Brown/Sea trout, Cod, Arctic char and Halibut

5* *as at 29 October 2010*

Norway

Background

During the annual meeting of NASCO, held in June 2010 in Quebec City, Canada, the Draft Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group was examined.

NASCO Guidance on Best Practice has the following aim for sea lice management and escapees:

The international goal for sea lice is ‘100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms’. The international goal for containment is ‘100% farmed fish to be retained in all production facilities’.

As an attachment to the draft report there is a review of the performance of each country done by the Focus Area Review Group.

The conclusions of the Focus Area Review Group on issues towards Norway’s performance are:

The following issues are not consistent with NASCO’s agreements and need additional actions:

- 1. Initiatives for international cooperation to minimise adverse impacts on wild stocks were not adequately described;*
- 2. Progress towards achieving the international goals for sea lice and containment was not demonstrated;*
- 3. Adequate measures to minimise the risk of disease and parasite transmission have not been implemented.*

Introduction

In Norway six potentially existential threats towards the wild salmon stocks are identified: acidification, hydropower regulation, other habitat alterations, the introduced parasite *Gyrodactylus salaris*, salmon lice and escaped farmed salmon. Acidification, hydropower regulation and habitat alterations appear as stabilized and the probability of further losses is regarded as low. The threat caused by *G.salaris* is currently regarded as relatively stabilized. However, the negative effect of these four factors on production makes the populations vulnerable to other threats. Sea lice and interbreeding between wild and escaped farmed salmon are categorized as the only threats to wild salmon populations in Norway that are clearly not stabilized. As a consequence Norway over the years significantly has increased its efforts to reduce impacts of salmon aquaculture on wild stocks.

Norway wants to give the following comments to the draft report from the Focus Area Review group.

Remarks from Norway

Issue 1

Norway has implemented several actions to preserve the Atlantic salmon, both in an environmental and fisheries perspective, and therefore find the work consistent with the

agreement. In our view, the report seems not to have taken this sufficiently into account and consequently some of the conclusions should be amended.

In the following, references are made to the report sent to NASCO in connection with the annual meeting this year.

First, we would like to draw the attention to Annex 5 in the Norwegian report, part 7 of the “Vision zero escapes” (Standardize), Norway participate (and chair) the international standardization work under the ISO – the International Standardization Organisation – in the ISO/TC 234. One of the main achievements will hopefully be to develop a common international technical standard for floating aquaculture installations, based on the content of and experience with the national Norwegian standard which have been in force since 2003 and was revised last year. Norway encourages all parties to support the ISO process.

Furthermore, in 2009 The Ministry of Fisheries and Coastal Affairs signed a memorandum of understanding (MOU) with Scotland concerning an environmentally sustainable aquaculture industry. An environmentally sustainable aquaculture industry is also a subject covered by the MOUs signed between our Ministry of Fisheries and Coastal Affairs, Canada and US. Norway hosts roughly one third of the remaining Atlantic salmon stocks and is farming more Atlantic salmon than any other country. Naturally our main focus is to deal with our own challenges in these areas, but international cooperation is important in order to learn from each other and gain experience.

Issue 2

Sea lice

One of the goals in the Norwegian Government’s Strategy for an environmentally sustainable aquaculture industry goal is: *“Disease in fish farming will not have a regulating effect on stocks of wild fish, and as many farmed fish as possible will grow to slaughter age with minimal use of medicines.”*. We believe this corresponds well to the NASCO’s aim, *“100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms”*,

Due to the serious sea-lice situation during autumn 2009, the Government placed on hold, the further expansion of Norwegian salmon farming. In November 2010 the Government allowed 5% increase in the production capacity in Troms and Finnmark counties.

Measures in accordance with NASCO’s Guidance on Best Practice have been taken. These measures include implementation of a new regulation handling sea lice in all fish farms.

Systems for monitoring sea lice in fish farms have been implemented. The number of sea lice per fish is reported to the Norwegian Food Safety Authority every month.

Sea lice on wild salmonids have been monitored since the 1990’s. Due to the serious situation last year, the Norwegian Food Safety Authority (Mattilsynet) allocated more resources, and increased the sea-lice surveillance programme on wild salmonids. In 2010 the both the Ministry of Fisheries and Coastal Affairs and Ministry of Environment provided extra budgetary funding for sea-lice research and monitoring, to the Directorate of nature conservation, Institute of Marine Research and National Veterinary institute. Similar funding – provided approval from the Parliament – be available also for the fiscal year 2011.

The Ministry of Fisheries and Coastal Affairs has also made a Strategy for an environmentally sustainable aquaculture industry. The challenges in the area of fish health and sea lice have been particularly described in this strategy.

The Norwegian Food Safety Authority (NFSA) describes its work against sea lice in three steps:

- The first aim was to implement a new national legislation and to increase the supervision from the NFSA (completed). Legislation is dynamic in order to meet any change in the sea lice situation.
- The second aim is to develop and implement regional legislation. This legislation makes it possible to coordinate and synchronize both preventive measures and treatment in larger areas, in contrast to one farm. A typical preventive measure is coordinated fallowing. Regional legislation is completed in the Hardanger area and public hearing is finalized for the counties of Trøndelag. Further areas are under consideration.
- The third aim is to contribute to a Committee on Area utilisation in the coastal zone, set up by The Ministry of Fisheries and Coastal Affairs. More on this topic below.

For the last two years, before the smolt migrates out to sea, the NFSA has organized a coordinated winter and spring sea lice delousing scheme, where delousing was compulsory if sea-lice infestations exceeding a treatment threshold of 0,1 sea-lice per fish. This campaign will be repeated in winter/spring 2011. Preliminary results from the annual surveillance program on sea lice on out-migrating smolt indicates that the 2010 year class – as the 2009 year class –migrated out to the sea without negative impact on the stocks due to sea lice infections. Consequently, the conclusions of the report should be amended.

Containment

In the Norwegian Government's Strategy for an environmentally sustainable aquaculture industry the following aim has been described: *"Aquaculture will not contribute to permanent changes in the genetic characteristics of wild fish stocks."*

We believe this corresponds well with the NASCO goals of *"100 % of farmed fish is to be retained in all production facilities"*. ,

Compared to the situation 20 years ago, Norway has demonstrated significant progress towards these highly desired goals.

In order to achieve NASCO's international goals for containment, Norwegian fisheries authorities have implemented new regulations in order to reduce the risk of smolt escaping from production plants. The regulation demands a double set of independent devices hindering fish to escape from land based operations.

Norway has also launched an exercise for developing a new national technical standard for all land based fish farming, including smolt production units.

The numbers of escaped Atlantic salmon from Norwegian fish farms, reported by fish farmers, have decreased since “the top year” 2006 and is now on the low end of the numbers from the last 15 years - despite a significant increase in production. However, the number of reported escaped fish is not an optimum metric for escapees and since escaped farmed fish do not have identical behavioral patterns, and escape figures are probably inaccurate. Accordingly, the most adequate indicator of potential harmful effect is the number of farmed fish found in salmon watercourses. The various stocks may have different levels of tolerance and robustness, and work is done to find suitable indicators/parameters to measure the influence of escaped salmon. Registrations of farmed salmon in numerous salmon watercourses since the 1980s, have documented that the number of escapees have been high in many watercourses. The number of farmed fish in salmon water courses decreased rapidly during the late 1990s, and has since continued to decrease – all though at much slower rate. The total reduction over the past 20 years is approximately 60%. Despite this reduction the levels of farmed salmon in several wild spawning populations remained above what is regarded as sustainable levels.

We anticipate therefore a further reduction in the percentage of farmed salmon observed on natural salmon spawning grounds in the following years as a result of increased effort in the last and coming years.

Consequently, the conclusions of the report should be amended.

Issue 3

In respect that Norway has extensive regulation in the fish health area, and the inspection performed by EFTA’s Surveillance Authority during spring 2010 showed few derogations regarding Norway’s management and implementation of EU’s fish health directive; EC 2006/88, the claims stated in this report is consequently questionable.

USA

The United States (U.S.) would like to take this opportunity to thank the members of the Focus Area Review (FAR) Group for Aquaculture and related activities. The Review Group and the NASCO Secretariat have clearly put forward considerable effort in conducting the reviews of each of the countries’ FAR reports. These efforts have yielded considerable benefits as evidenced by the Review Group’s draft report issued in advance of the ISFA/NASCO Liaison Group meeting and this year’s special session at the annual NASCO meeting. The work of the review group has greatly increased NASCO’s effectiveness and efficiency through increased transparency, a primary goal of NASCO’s ‘Next Steps’ process. While we believe the Review Group’s report was quite thorough, we would like to offer the following information and points of clarification for the Review Group to consider as it develops its final report.

The Review Group stated that it would be desirable for future FARs to focus on outcomes and progress towards achieving the international goals so as to properly demonstrate whether or not salmon stocks in areas with salmon farming are in as healthy a state as those in areas without salmon farming. We agree that the first round of FARs focused more on what Parties are doing to implement the NASCO agreements and that perhaps future rounds of reporting could focus on outcomes. We suggest that the ‘Next Steps’ review process, as agreed at the 2010 Annual NASCO Meeting, evaluate the FAR process and consider if it achieved what

was intended and if it should be continued or altered in future years to focus more on outcomes and deliverables.

The Review Group highlighted the frequent absence of wild salmon stock considerations in risk assessments and strongly encouraged all jurisdictions to incorporate these considerations into decision-making processes in the future. Permitting programs within the U.S. place the burden on the applicant to demonstrate that what they propose will not have adverse effects on the environment and the highest priority for protection is placed on endangered species, including the Gulf of Maine Distinct Population Segment of Atlantic salmon.

The Review Group recognized that progress has been made by the salmon farming industry in addressing impacts on wild salmon stocks but concluded that no jurisdiction was able to show that it had reached a situation where it had achieved the international goal. This is very unfortunate. In the coming years, the U.S. will be working to ensure that subsequent Aquaculture FARs will be able to clearly show that the goal has been met. Further, we support the work of the Liaison Group to identify an appropriate reporting format to ensure that there is a clear and transparent way to track progress toward the international goal and to facilitate information exchange among parties to facilitate achievement of the goal.

We acknowledge that there was limited information presented in the U.S. FAR to allow assessment of progress towards the international goals for sea lice and containment. As noted previously, our report focused more on identification and description of the programs and processes within the U.S. to implement the Williamsburg Resolution and less on the outcome of those programs. We have experienced a significant reduction in reported losses from commercial aquaculture facilities and detection of escapees in the wild in recent years which we believe can be attributed in part to the implementation of improved inventory tracking and containment management systems (including audits). We expect that future reporting through the Liaison Group will more directly address tracking progress toward achievement of the international sea lice and containment goals.

The Review Group stated that adequate measures to control movements into a Commission area of reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes have not been implemented. The Review Group also stated that the procedures to ensure that no non-indigenous fish species are introduced into a salmon river that would have unacceptable risks of adverse impacts to the wild stocks are not adequately described. The Review Group appropriately highlighted these issues. In the U.S., legal and illegal stocking of non-indigenous anadromous salmonids and other non-indigenous fish species does occasionally occur, although less frequently than in the past. As such, the U.S. will take the Review Group's report into consideration as we develop the Recovery Plan for the GOM DPS. We believe this is the appropriate venue to address these outstanding issues raised by the Review Group.

The Review Group stated that the US FAR did not adequately describe the procedures in place to initiate corrective measures. We agree this could have been clearer. We do, however, believe the procedures in place are consistent with the Williamsburg Resolution. Subsequent Aquaculture FARs will be clearer on this point.

Finally The Review Group stated that the ESA consultation process does not have regulatory enforcement power. We wish to clarify that the ESA consultation does, in fact, have

regulatory enforcement power and that regulatory power can and has been used for the conservation of endangered salmon in Maine.

The US notes that there were comments from the NGOs that were not unanimously agreed to by all members of the Review Group. The NGOs expressed concern that the principles of NASCO Conventions, such as the Williamsburg Resolution, should apply throughout a jurisdiction as well as several other issues such as the need for enforcement, a presumption against farming, issues not addressed in the Williamsburg Resolution, and issues not addressed in the FARs. The U.S. thanks the NGOs for their thoughtful and thorough critique.

CNL(10)33

ISFA Comments on the Draft Report of Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group



INTERNATIONAL **SALMON** FARMERS ASSOCIATION

May 15, 2010

Malcolm Windsor, Secretary
NASCO
11 Rutland Square
Edinburgh EH1 2AS UK

Dear Malcom:

As promised at the April 29 and 30, 2010 Liaison meeting in London, we have compiled industry comments on the *Draft Report of Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group Report issued by the North Atlantic Salmon Conservation Organization on April 9, 2010*. After the London meeting, each of the industry associations, which are all members of ISFA, provided me with their country's comments on the Report. I have structured this response to reflect the diversity of our industry and the different perspectives and experiences of the North Atlantic countries but it still a response on ISFA's behalf. As I hope you can appreciate, we all share a common goal of conserving wild salmon, but we also have jurisdictional and operational differences that inform this collective response to the FAR.

Our general comments were provided by ISFA to the Liaison Group in the April 30 document: "ISFA Comments on the "Draft Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group" which has been revised slightly and is attached. The following document contains comments specific to each region.

We trust these will be taken with the seriousness and care with which they have been prepared and look forward to further discussions.

Yours truly,
by email correspondence
Nell Halse, President
International Salmon Farmers Association

EAST COAST CANADA

(prepared by the New Brunswick Salmon Growers Association / NBSGA on behalf of the industry on the East coast of Canada)

Canada has a very extensive eastern region that is governed by both the federal government and four provincial governments. In fact, this region includes three zones that are designated for implementation of the protocols within the Williamsburg Resolution. All regulators and the industry in these areas are committed to protecting wild salmon and to supporting a sustainable aquaculture sector. Regulations are risk-based and are based on each unique ecosystem.

The reporting measures for the FAR report were not well understood and the reporting template proved to be restrictive and did not allow for enough information to be presented in a way that could demonstrate how progress was being made or to reflect the differences among the various jurisdictions in Canada. Because this was also the first report of its kind, the information should form the basis from which progress can be measured in the future.

There were several issues that were raised by the Review Committee about Canada's report that require further clarification. Initiatives for international cooperation not adequately described Because this area was not specifically identified in the template and because space was restricted, this area was not fully explored in the Canadian FAR submission. Canada has many agreements and initiatives in place that support international and interprovincial cooperation to minimize adverse impacts on wild salmon. These activities address the following areas:

- Introductions and transfers of aquatic organisms;
- Incorporation of sophisticated risk assessments tools and codified procedures;
- Fish health and sea lice management.

Examples of direct engagement by industry include:

- Ongoing and direct participation in the ISFA/NASCO Liaison Group;
- Ongoing and direct participation in the WWF Salmon Aquaculture Dialogue;
- Participation in an international sea lice research workshop hosted by Norway in February 2010;
- Hosting of two international workshops on sea lice in New Brunswick in the fall and winter of 2009-2010 that brought together researchers, industry and fish health experts from around the world and helped develop the framework for an Integrated Pest Management Plan and a supporting research program;
- Canada hosted and provided industry, government and science leadership at an international sea lice conference in British Columbia in May: Sea Lice 2010 In addition several east coast salmon farming companies are certified to internationally accredited third party quality and eco label programs.

Progress toward international goals for sea lice

Canada has implemented most of the best management practices and reporting and tracking mechanisms that are recommended within the Guidance On Best Management Practices SLG(09)5. Heavy sea lice loads have been the exception rather than the rule in Canada's salmon farming industry. The absence of a formal sea lice reporting program does not equate to an unaddressed problem; rather, it is indicative of the infrequency of the issue, the success of fish health management programs in the past and the affects of severe winters.

In addition, the east coast salmon farming industry, independent of regulators, is implementing an integrated pest management strategy for sea lice that involves the reporting of sea lice numbers to a third party data system with every company and farm following a standardized monitoring program. The industry is also supporting the development of a third party monitoring system that will ensure that sea lice reporting by companies is independently verified.

Monitoring sea lice numbers on wild salmon should not be the responsibility of salmon farms but rather the responsibility of federal and/or provincial authorities in some index rivers.

Action plan to minimize escapes

The potential for farm escapes is addressed within Canada's Code on Introductions and Transfers whereby a risk assessment forms part of the decision making process *before* smolts are moved from hatcheries to ocean farms. Biological risk from potential escapement is reviewed and must be deemed an acceptable risk before the introductions and transfers activity will be permitted (i.e. the salmon moved to the farm).

Escapement events are rare and fall within provincial jurisdiction. Each authority's approach may be different; however, they remain consistent with the intent of the Code and the Williamsburg Resolution. Most provinces have a Code of Containment under which salmon farms operate. Even before governance systems were implemented in regulation, the industry has followed a voluntary reporting practice. Examples of voluntary reports can be provided.

Measures to minimize the risk of disease and parasite transmission

Minimizing the risk of disease and parasite transmission begins with the *Code on the Introduction and Transfer of Aquatic Organisms* where fish health and pest management form an integral part of the risk assessment decision-making process. In addition, Canada is in the midst of legislative change that amalgamates this aquatic responsibility into its established terrestrial animal health agencies and provincial veterinarian systems. Canada looks forward to reporting on this progressive initiative once completed.

That this legacy of innovation has occurred within a multiplicity of jurisdictions and interests supports the notion of common interest among all parties to implement a Canadian approach to a Best Practice.

In Canada, fish health is generally under the jurisdiction of provincial governments who may take a somewhat different approach unique to each region. However, they achieve the same goal. Experience has shown that local adaptive management has generated more effective results than the initially envisioned consistent "one size fits all" approach.

Control reproductively viable Atlantic salmon and non-indigenous anadromous Salmonids

Canada's Code has been ratified by the federal government, the governments of its ten provinces and two territories and it incorporates sophisticated risk assessment tools and codified procedures, which have been recognized internationally [e.g. ICES] as being a Best

Practice. NAC(05)7 does not specify what decision making tool is used by the United States.

Canada continues to use its Code to assess introductions and transfers applications. Decisions associated with the importation of “*reproductively viable Atlantic salmon and non-indigenous anadromous salmonids or their gametes*” from outside the Commission area are very rare. They would likely involve the imposition of special containment requirements to meet the risk assessment mitigation requirements of the Code to reduce risk to a level acceptable to the recipient jurisdiction. Such decisions are reported annually as required under NAC (05) 7 and are thus in compliance with established NASCO procedures. Absence of recent reports only indicates the rarity of the action.

Classification/zoning system development

Canada does not classify its rivers with respect to introductions and transfers nor aquaculture activity. However, Canada’s Code assesses every introduction and transfer within its risk assessment process for the ecological impact of potential escapement.

Permits are issued when risks are deemed acceptable (i.e. low risk) to the recipient jurisdiction.

As well, all Canadian jurisdictions undertake extensive cross-agency consultation in regards to the licensing of aquaculture activities. These reviews include the risks associated with this concern. While Canada protects its salmon resources in the area of introductions and transfers and the licensing of salmon aquaculture activity, the remaining 95% of Canadian rivers and 98% of Canada’s salmon resource are remote from either activity and are thus not impacted (i.e. low risk).

Procedures to initiate corrective measures not adequately described

In Canada, jurisdictional mandates dictate the manner in which local situations are addressed. This often results in a variety of approaches being taken to achieve the same goal. While that diversity (i.e. the absence of a consistent approach) does create variations in methodologies, it does not necessarily mean that we are not dealing with the local situation. Experience shows that local adaptive management will generate a more effective approach than the initially envisioned prescriptive “consistent approach”.

Canada continues to work with all parties to ensure the intent of the measures is met and that we protect the ecological integrity of our aquatic environments. Although Canada’s diverse geography and systems can create problems for reporting, it will continue to report in as complete and comprehensive manner as resources permit. In addition, all Provincial and Federal Acts and Regulations noted in the FAR enable the Minister to take various forms of action if operators fail to comply with regulations, terms and conditions of license etc., which can include the revoking of licenses.

The NBSGA had the opportunity to participate in the 29-30 April 2010 meeting of the ISFA-NASCO Liaison Group and contributed to general comments in that report. However we feel the following points should be reinforced:

Process – the process for the development of any FAR report should allow time for all countries to have the opportunity to respond and for that response to be considered prior to the release and circulation of any draft report. We also note that it was inappropriate for NGOs to circulate the country reports among their members when the Parties and the Industry did not have the same opportunity.

Report Structure – the Draft Report was full of opinions by reviewers that were not grounded in either science or in material submitted for review – these opinions went beyond providing recommendations and/or feedback on where additional actions may be helpful and have no place in this report. Examples include: “resistance to sea lice treatment is a worrying development” statement on page 16; section 5.26 regarding responsibility for setting standards; section 5.28 “sea lice larvae can survive independently for 20-50 days” and page 14 Box entitled “Scale of Activities.” We ask that such unsubstantiated comments be removed from subsequent reports.

Reviewers – It would be beneficial to include biographies of the reviewers of the various country reports. There also needs to be a clear recognition that the NGOs were not engaged as reviewers and that they are, in fact, a special interest group, albeit recognized by NASCO. The NBSGSA is by definition a non-government organization and yet we were not part of this body. The NGO statements (page 17) should be included only as an appended Minority Report.

In closing the Canadian east coast salmon farming sector is committed to environmentally sustainable and economically viable operations that are focused on continuous improvement, innovation and collaboration. Our products help to eliminate pressure on wild Atlantic salmon stocks and our companies work with local salmon conservation organizations to help to rehabilitate and preserve wild salmon.

Indeed, NASCO’s role is not to regulate industries but to provide a forum where all parties can work together to ensure wild salmon stocks are protected.

NORWAY

(prepared by the Norwegian Seafood Federation / FHL)

- a) The international goals for sea lice and containment written as: *100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farm and 100% farmed fish to be retained in all production facilities* are to be looked upon as visions that we as industry are striving to reach more than exact goals. Based on this, NASCO should focus on the parties’ progress.
- b) The NASCO Council Report of 2009 reads: *He (the president of NASCO) noted that there had been some discussions about the involvement of the salmon farming industry, but noted that they have already been involved in the work of the Task Force and he anticipated that they would be appropriately involved in the preparation of the FARs within each jurisdiction.* This has been poorly followed up by most of the parties in the preparation of the FARs.

- c) In point 5 the Review Group underlines that some jurisdictions have not submitted FARs to NASCO. It should be mentioned in the report that NASCO has no mandatory role and it is up to each jurisdiction if and how it wants to respond. In this process, NASCO's main role is to facilitate and encourage international cooperation.
- d) Under Methodology, point d) it should be pointed out that this did not apply to the NGO-members of the Review Group.
- e) In point 5.16 the Review Group says that: "*little consideration appears to be given to the risks to the health, genetic diversity and status of wild salmonids*" when sites are applied for. This opinion of the Review Group cannot be substantiated as many, if not all, jurisdictions in NASCO have regulations and site approval processes that do take these risks into account.
- f) In point 5.25 the Review Group expresses opinions on the size of the salmon aquaculture industry and makes direct links between industry size to risks on wild populations. There is no automatic linkage between the two. Rather, it is more important to consider the regulations and enforcement of the industry and the industry's efforts towards sustainability.
- g) It is not always clear why some of the text in the Report is highlighted in bold and placed in separate text boxes.
- h) Point 5.38 is an assumption made by the NGO members of the Review Committee that is not substantiated and should either be taken out or made part of an NGO-appendix.
- i) There is a question about the time-consuming work that is required by the jurisdictions to report to NASCO. Is this the right use of resources? The main thing is the national regulations and policies and the manner in which the authorities and the industry are striving to meet common goals. There are probably better ways for the Parties to report to NASCO as part of a process for NASCO to better reach their objectives, but that is for the Parties to decide.

When it comes to the summing up on each FAR, the following comments are relevant to Norway:

- 1) There is a lack of connection between the comments and the three bullet points
- 2) More than one third of the comments deal about *G.salaris*. There is no connection between salmon farming and the spread of *G.salaris*. The risk of spreading *G.salaris* is mainly connected to sports fishing and enhancement activities.
- 3) Of all the papers that have been published on salmon biology, possible interaction between salmon farming and wild salmon and related topics, the Review Group mentions only one model study, a model that, to our knowledge, has never been verified. This brings into question the validity of these comments made by the Review Group.

UNITED STATES

(Prepared by the Maine Aquaculture Association / MAA)

The MAA supports the initial comments provided by ISFA to the Liaison Group on the 30 April but would like to make the following points.

Jurisdictions' ability to demonstrate progress.

Throughout the document the Review Group repeatedly refers to the various jurisdictions' inability to demonstrate progress towards achievement of the Williamsburg Resolution and the subsequent guidance on BMPs. We would like to highlight two concerns.

- 1) Over the years ISFA has often indicated that the establishment of absolute measures, goals or action levels that may not be achievable in the real world will lead to false expectations, frustration and disappointment in both the parties and stakeholder groups associated with the NASCO treaty. Most recently, during the formation of the Guidance on BMPs ISFA members repeatedly expressed concerns about establishing goals on containment and sea lice management that were inherently unachievable and unrealistic. While ISFA agreed to those goals it did so with serious concerns that they would result in, and indeed guarantee, the continual criticism of the parties even if they were making determined efforts to achieve the goals. The FAR Review Group report appears to justify this concern. We respectfully suggest that the Parties re-examine what they have agreed to and determine whether they are prepared to be eternally criticised for falling short of these goals.
- 2) Aside from an inherent inability to achieve absolute goals, we are additionally concerned that two factors are inhibiting the Parties' ability to demonstrate progress towards those goals: first, the timing of implementation of management measures relative to when an assessment of progress is being made and second, the lack of data with respect to wild salmon populations.

In regards to the first factor, the Review Group acknowledges in several instances that the parties and the industry have enacted significant measures that are designed to address impacts on wild salmon stocks. The report references the "wealth of regulations and measures" but notes the FARs do not contain data adequate to assess a jurisdiction's "progress." The term "progress" denotes a change in position over time. Indeed the draft review directly acknowledges this change over time concept in its report.

"4.4 The Review Group recognised that while the BMP Guidance was only agreed in 2009, NASCO's agreements relating to aquaculture, introductions and transfers and transgenics date from the early 1990s and many elements were subsequently included (my emphasis) in the Williamsburg Resolution together with the Liaison Group's 2001 Guidelines on Containment of Farm Salmon. The BMP Guidance was developed to assist in strengthening the application and interpretation of the Williamsburg Resolution. The Review Group, therefore, felt that all jurisdictions with salmon farming should be able to demonstrate clear progress towards achieving the international goals but in most cases data to demonstrate progress was not provided."

Given the FAR reporting format that focuses on reporting of the current state of affairs and the fact that many of the measures designed to address potential aquaculture impacts on wild salmon stocks have been in place for some time it is inherently difficult for the parties to demonstrate “progress.” We respectfully suggest that future FAR reporting requirements include a historical summary of the regulations and measures that have already been enacted along with the time they were first put into place. We believe that this will assist the Parties in documenting the extent and speed of their progress towards achieving the international goals. ISFA believes that significant progress has been made and that the Parties and the industry are not being given credit for this because of the current reporting format and focus on achievement of absolute goals.

In regards to the second factor that the lack of data on levels of hybridisation between farmed and wild stocks and levels of sea lice in wild stocks makes any assessment of the efficacy of management measures virtually impossible, ISFA concurs with this finding and commends the Review Group for recognising that the lack of historical data makes it virtually impossible for the parties to demonstrate progress. Indeed the Review Group acknowledges this in section 5.22. of their report. Within the last twenty years significant measures that were designed to address potential impacts on wild salmon stocks have been enacted. Many of these actions were enacted some time ago and the lack of data on wild stocks before their enactment makes it virtually impossible to determine the efficacy of these measures. The industry has spent millions of dollars in complying with regulations, improving operations and developing new techniques that were designed to address the potential impacts on wild stocks. The parties have spent millions of dollars in developing and enforcing regulations and coordinating these efforts through NASCO.

To have imposed these costs on endangered working waterfronts in coastal communities and to have spent large amounts of public funds without any ability or effort to assess the efficacy of these investments is not responsible or effective management. Indeed the lack of retrospective data makes any Review Group’s ability to assess the party’s progress virtually null and void. Until NASCO and its parties address this issue, further reviews will result in the same findings as the current one and will serve no purpose except to engender further criticism of the parties and a clear documentation of NASCOs ineffectiveness. This will serve neither NASCO, the Parties nor the salmon well.

5.14 International cooperation to minimize adverse impacts on wild stocks.

The Review Group acknowledges the existence of a number of forums for international cooperation and the coordination of efforts to minimise potential adverse impacts on wild stocks but misses several important ones.

For example the Review Group’s report does not reference a number of important and well developed third party certification programs such as Global Gap, the Aquaculture Certification Council, Seafood Trust, Friends of the Sea, and a number of organic certification programs. The Report does not reference the overarching initiative undertaken by the United Nations Food and Agriculture (FAO) on Guidelines for certification programs. Additionally the Report does not reference the International Standards Organisation’s (ISO) aquaculture initiatives on the development of technical standards for equipment that is designed to reduce the risk of equipment failures. All of these initiatives are ongoing and will result in significant standards, certification programs and BMPs that will directly address many of the concerns expressed by the NASCO Parties.

ISFA has repeatedly expressed its concern that NASCO's focus on the development of BMPs and regulations intended to reduce potential adverse impacts on wild stocks simply duplicates these other initiatives. The fact that these efforts are not acknowledged in the FARs or in the Review Group's report heightens our concern that NASCO may be disconnected from these other important initiatives. ISFA respectfully suggests that NASCO invest the time and effort required to familiarize itself with these initiatives to make sure that its efforts are not duplicative and create unnecessary costs to the Parties.

This effort would be consistent with the Terms of Reference for the FAR Review Group and should be included as part of the final version of the FAR Review Group report.

Risk Assessments

The draft Review Group report suggests that existing risk assessment methods employed by the parties in the various NASCO jurisdictions are inadequate. Specifically in Section 5.16 of the report the review committee states:

"The Review Group notes that while there is often a requirement to consider the impacts on the marine environment (particularly benthic impacts) or exposure of the site, little consideration appears to be given to the risks to the health, genetic diversity and status of wild salmonid stocks in the decision-making process."

We disagree strongly with this statement and are astounded that either the Parties have not more effectively communicated their risk assessment methodologies to NASCO as part of their FAR responses or that the Review Group has not understood those methodologies that were communicated by the Parties.

ISFA members must apply, through a number of methods, for the license to operate a farm in public waters in all NASCO party jurisdictions. As applicants who go through these comprehensive, extensive, costly and complicated processes, it is our experience that the potential risks to the health, genetic diversity and status of wild stocks are routinely considered during the decision making process. Indeed these standards and their consideration are explicitly articulated in all NASCO Parties' statutes and regulations in one form or another.

ISFA respectfully suggests that it is in the Parties' best interest to require the Review Group to specifically review each Party's statutes and regulations and document how they do not meet the risk management goal. If this statement cannot be substantiated, the Review Group should strike it from the record.

SCOTLAND

(prepared by the Scottish Salmon Producers Organization / SSPO)

The SSPO supports the initial comments provided by ISFA to the Liaison Group on the 30 April. Additionally we would make the following points.

General Comments

The SSPO has been generally supportive of the NASCO Focus Area Review (FAR) initiative. It has believed that the FAR process might serve to facilitate progress towards the strategic objectives of the NASCO Parties and the Atlantic salmon 'community of interest',

of which SSPO members are a significant part.

On the basis of the *Aquaculture, Introductions and Transfer and Transgenics* FAR, SSPO continues to feel that the sharing of information contained in the FAR submissions across jurisdictional areas, national farming industries and fisheries could have benefits in promoting greater mutual understanding. However, the NASCO Reporting process on the FAR has not been a useful or forward looking exercise and we find it difficult to identify where it has added value to the information provided in the FAR reports.

The Scottish Salmon industry has a range of clearly identifiable sectors: sports and leisure angling; net-fisheries; and Salmon aquaculture for food production (farming) and river stocking. Each of these sectors ultimately relies on the ‘king of fish’, but only aquaculture is not directly dependent on the harvesting of wild fish.

It is important to state that:

- SSPO shares NASCO’s objectives *to manage salmon fisheries to promote and protect the diversity and abundance of salmon stocks*; these stocks are not only important as a basis for maintaining natural fisheries they represent the ultimate genetic resource on which the aquaculture industry is based;
- SSPO members have played a major role in the conservation of Scottish wild salmon; without the development of salmon farming the demand on Scotland’s natural fisheries may well have led to their terminal decline;
- SSPO members grow salmon in some of Scotland’s most remote, economically fragile and environmentally-valued areas of the country; they are a key part of local communities and are focused on sustainable aquaculture, supported by continuous improvement and technological innovation.

Comments on Review and Draft Report Process

Our expectation was that the NASCO review process would potentially add value to the FAR reports, possibly bringing new insights or drawing attention to features that would have benefits to the whole process. However, this has not been the case. Rather, we have an underlying concern that the investment in time and resources represented by the review was disproportionate to any discernable benefits we can identify. We believe this reflects an underlying problem in the NASCO processes. As specific points we have concluded:

The review process would have been more effective and would have commanded a greater respect if it had been specified more in accord with a conventional international scientific or project evaluation. A better and more uniform engagement of all sides of the Atlantic salmon community, including aquaculture producers, in the Review Group would have resulted in a more insightful and productive process.

- The review report fell short of the standards and a level of detail that would normally be expected of an international evaluation. It lacked any indication of the background or basis of selection of the review team, and the way in which the review process was undertaken was not specified;
- Whilst it is a reasonable assumption that NASCO will provide the Secretariat for the review process, the Review Group should have been led by an independent Chairman, who was not associated with any of the relevant governmental bodies or agencies or

non-governmental bodies aligned with NASCO. If the review reports are to be transparent and command confidence we believe this is an essential requirement;

- The review process was fundamentally flawed in that there was no in-jurisdiction visits, to allow review members to clarify points or ask question or understand the different approaches that are adopted. As a consequent, the review report suffers from misunderstandings and misinterpretations, which do little to commend it to those who had contributed to the FAR.

Points on EU-UK (Scotland)

The pen-picture summary (page 29 *et seq* of the Review Groups draft report) indicates that the Review Group has substantially failed to understand either the underlying philosophy or the practical details of the approach that has been adopted in Scotland. As a small country with a history of working collaboratively, we are proud to say there is a considerable record of a coordinated collaborative approach between the Scottish Government and its agencies and the finfish farming industries (including salmon and other species).

This approach has led to the publication of two Strategic Framework documents for Scottish Aquaculture, the first published in 2003 and the second in 2009. As a strategic action arising from the first of these documents, a comprehensive Code of Good Practice for Scottish Finfish Aquaculture was developed involving wide consultation, not only with the Aquaculture industry but with a very wide range of stakeholders.

This process is now being repeated not because the present Code is ‘outdated in regard to containment’ (as stated in the review) but because the proposals of the second Strategic Framework, and the recommendations of Working Groups and Sub-groups, which have been established to take forward its implementation, need to be incorporated in the Code.

Likewise the report states that ‘new initiatives for improved disease and parasite control are being developed but are not yet in place’ as if this were a criticism. However, to the contrary, this situation will, and should always be the case because the situation reflects the constant introduction of new developments and innovations. As with the repeated revision of the Code of Good Practice, it reflects the commitment of the Scottish salmon industry to continuous technological and professional development – something of which the industry is justifiably proud.

The ISFA comments on 30 April have highlighted the fact that the Review Group has in places expressed opinions rather than evidence-based comments, including paragraph 5.26 on standard setting. Reflecting this we would similarly draw attention to the statement forming the last sentence of the penultimate paragraph on page 29. This suggests that in Scotland there has been an ‘evolution in approach’ --- ‘from voluntary approaches, through accreditation schemes, such as the Code of Good Practice, to legislation and enforceable regulation’. This is simply an incorrect understanding and is misleading in its implications. Moreover, it seems to reflect the same lack of evidence-based analysis highlighted elsewhere and the Review Group’s unsupported opinion. Finally, since the ‘conclusions’ of the review at the end of the Scotland section are not referenced to the supporting evidence, it is difficult to make comment on them. However, we particularly reject the statement that ‘adequate measures to minimise the risk of disease and parasite transmission have not been implemented’.

ISFA Comments on the “Draft Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group”

April 30, 2010

London

These comments represent ISFA’s initial feedback to the Report. It is ISFA’s intent to submit a more detailed report in time for NASCO’s next mailing.

General Comments:

The International Salmon Farming Industry shares the objective of conserving and enhancing wild salmon stocks.

- ISFA members help to preserve wild salmon by filling the consumer demand for high quality, nutritious salmon thereby reducing pressure on wild Atlantic Salmon.
- ISFA promotes an environmentally sustainable and economically viable salmon farming sector that is focused on continuous improvement, innovation and collaboration.
- Significant milestones have been reached in the areas of containment and fish health and the industry welcomes NASCO’s support for access to a full suite of tools for fish health management.

An environmentally sustainable, socially responsible and economically viable international salmon farming industry should not be impeded, but rather complemented by the work undertaken by NASCO.

Specific Comments on the Draft Report and Review Process

1. Process

A better engagement of ISFA members within the review process, both in the drafting of the FAR reports and in the Review Group itself would have led to a more effective, constructive and productive process.

The Review Process and the Report submission process is not clearly defined. The Report would be more complete if accurate assessment of the cost were included. ISFA requests that the Liaison Group be given the opportunity for comment and input into the final report of the Review Group after the Special Session in 2010 and before NASCO 2011.

2. Clarity on Goal statements

While the Task Force affirmed the common goals of 100% of farms having effective sea lice management and the containment of 100% farmed fish in all production facilities, the Review Committee should have looked for progress towards these goals, rather than achievement. (see page 14 – box under Introduction: “...no jurisdiction was able to show that it had reached a situation where it had achieved the international goals.”) If the Review Committee only looks for achievement of the international goal, the report will always be negative and progress will not be recognized.

3. Opinions rather than evidence and science-based comments

The Draft Report contains a number of opinions and beliefs that are not evidence---based. Such comments should be referenced to link them to the appropriate scientific background. Some examples are:

- “resistance to sea lice treatment is a worrying development” statement on page 16
- section 5.26 regarding responsibility for setting standards
- section 5.28 “sea lice larvae can survive independently for 20---50 days”
- page 14 Box entitled “Scale of Activities”
- section 5.21 “There are also instances where the value of the wild stocks has been adversely affected by impacts from aquaculture and related activities.”

4. Role of Special Interest Groups on the Review Group

There needs to be a clear recognition that the NGOs are special interest groups, albeit recognized by NASCO, not independent reviewers. The NGO statements (page 17) should be included only as an appended Minority Report.

Our understanding was that this was to be focused, tightly controlled professional Review undertaken by selected members of the review committee. However, the NGO / special interest group members of the Review Committee treated it as a public consultation and circulated the documents widely.

Unlike the NGO community, ISFA was not only excluded from the Review committee; its members were not given access to other countries’ reports.

It is our understanding that members of the Review Committee did not review their own country’s reports. (page 7 – 5.6 d) However, this apparently did not apply to the NGO / Special Interest representatives. ISFA views this as a clear conflict of interest.

We are very concerned with the tone and implication of Section 5.38 in the report which states:

*“The NGOs note that several of the FARs from jurisdictions with salmon farming omitted some information or procedural knowledge that is publicly available and is known to the NGOs in those jurisdictions. **With those omissions the FARs appeared to present a more favourable picture than the actual situation** (ISFA emphasis) with regard to the impacts of salmon farming on the wild salmon stocks or on efforts to avoid such impacts.”*

Is it the report’s intention to suggest that some of the parties intentionally misrepresented and mislead the Review Group? This would seem speculative at best and inflammatory at worst. ISFA believes that the parties responded to the FAR requests with all sincerity and request that this statement be stricken from the report.

5. Annex 1 – CV of Reviewers should be attached

It is normal practice for a Report of this nature to include an Annex with the CV of each of the reviewers and an identified Chairman. In keeping with NASCO's commitment to transparency, this should be added to the Report.

In summary, the science for management practices is changing quickly and we need to be able to bring new science to the table at all times. The reporting measures were not well understood and the reporting template proved to be restrictive and did not allow for enough information in a way that demonstrates how progress has been made.

CNL(10)37

***NGO Response to ISFA Comments
on the NASCO Draft Aquaculture Focus Area Review Report***

The NASCO process

1. The ISFA response demonstrates a complete lack of understanding of the role of NASCO as an organisation, the Next Steps process and the role of the NGOs accredited to NASCO in that process.
2. The objectives of NASCO are the conservation, restoration and rational management of wild Atlantic salmon. The NGOs accredited to NASCO have to demonstrate that their objectives are consistent with those of NASCO.
3. While ISFA maintains that they support those objectives, ISFA is essentially a trade association and the principal objective of a trade association is to protect and promote the interests of its members whose activity is the commercial farming of Atlantic salmon. This activity has been found to be in conflict with the management and survival of wild salmon wherever the two resources co-exist.
4. NASCO is an inter-governmental treaty organisation to which there are currently six signatories (Iceland having resigned). NASCO operates on the basis of consensus, so no agreement can be reached without the full agreement of all the Parties.
5. In 1994, NASCO agreed the Oslo Resolution, with the aim of minimising the impacts of salmon aquaculture on wild salmon; this was superseded in 2003 by the Williamsburg Resolution, with the same over-arching objectives.
6. In 2004, as part of a 20 year Review, NASCO agreed to introduce its 'Next Steps' process. This process included the production, by each jurisdiction within the Parties, of an Implementation Plan, describing in detail how they were managing, and planned to manage, their wild Atlantic salmon stocks in line with and to implement NASCO agreements on habitat, fisheries management and impacts of aquaculture. As part of this process, the Parties agreed a three year cycle to examine in detail the implementation of NASCO agreements on fisheries management (year one) habitat (year two) and aquaculture and introductions (year three). This is the Focus Area Review process in which we are currently engaged.
7. A further agreement by the Parties enabled full participation by the NGOs accredited to NASCO, not just in the 'Next Steps' process, but in the annual meeting and any intercessional meetings that take place. The aim of all this is to make NASCO a fully transparent organisation, and through its accredited NGOs, more publicly accountable.
8. **So, in the context of the Aquaculture FAR, NGOs are not “special interest groups” as has been alleged; they are an integral part of the NASCO process, a process which has been fully ratified by the Parties at NASCO.**

9. The NGOs at NASCO (34) represent more than 5 million members across the North Atlantic dedicated to the objectives of the organisation. It is worth reinforcing here, that like salmon farming, wild fish represent a hugely valuable resource, both in terms of their sporting and commercial exploitation, often benefiting remote rural communities.

Response to ISFA comments

10. The Aquaculture FAR is not an independent report; that was not the objective. The FAR is an internal report for NASCO, examining how jurisdictions are implementing the Williamsburg resolution and managing the impacts of aquaculture on wild Atlantic salmon.

The draft report will be discussed at NASCO Council in June 2010. The fact that ISFA has been given an opportunity to comment on the draft report, ahead of the Parties, is of some concern to NGOs as it perhaps indicates undue influence by the Industry on the NASCO process. This could be regarded as a testament to the transparency of the organisation, **but the NGOs remind the Parties at NASCO that in this forum they are representing wild Atlantic salmon, and not the salmon farming industry.**

11. **The idea that the process would have been more effective if IFSA had been part of the Review Group is rejected.**

The whole point of this exercise is that it is a review of how jurisdictions are implementing (or not) the Williamsburg Resolution, and this review had to be carried out by individuals, nominated by the Parties and the accredited NGO Group, on behalf of wild salmon interests, independent of the aquaculture industry. **Self-assessment, like self-regulation, clearly does not work.**

12. **Criticism of the competence of the reviewers is unacceptable.**

The representatives of the Parties and NGOs were selected by the Parties (Canada, USA, Norway and Faroes) and NGOs (US and Norway) for their knowledge and experience of impacts of aquaculture on wild salmon. The addition of CVs might be helpful when the report is finally published.

13. **Criticism of the science involved in these assessments is also unhelpful.**

The scientific advisor to the Review Group is a former Chairman of the ICES Advisory Group to NASCO, and an eminent wild salmon scientist. Moreover, there is a wealth of scientific evidence to demonstrate the various impacts of salmonid aquaculture on wild stocks, much of it summarised in the NASCO/ICES Bergen symposium of 2005. A more recent summary of this research across the N. Atlantic has been compiled and published by the UK Salmon & Trout Association.

14. **While it would be premature to claim that all this research was definitive, there is certainly more than enough evidence to justify taking action to protect wild fish on the basis of the precautionary approach, an approach to which all the NASCO Parties have agreed.**

15. ISFA challenges many statements of the Review Group as “opinions”, yet their own document is full of their own opinions, such as:

“ISFA promote an environmentally sustainable salmon farming sector...”

“ISFA help to preserve wild salmon by filling the consumer demand etc.”

The country comments are also littered with criticism of these “opinions” which are actually based on the science referred to in para 13.

16. Acceptance by ISFA that salmonid aquaculture can and does impact wild salmon is an essential precursor to taking action to minimise those impacts.

The targets set out in the Best Management Practice recently agreed by the Task Force were a good step forward. **Challenging peer-reviewed science on the subject now, is not helpful.**

17. ISFA has also challenged the phraseology of the Review Group conclusions. Broadly, these were that no jurisdiction had demonstrated full compliance with NASCO guidelines on minimising the impacts of aquaculture on wild Atlantic salmon. ISFA suggested that this approach did not allow for measurement of progress towards those objectives.

18. **The NGOs have some sympathy with this complaint, and suggest that a “scorecard” approach would enable comparison both within and between individual jurisdictions.**

NGO Conclusions

19. The NASCO/ISFA Task Force has produced appropriate goals on escapes and sea lice control which the Industry, Parties and NGOs have all endorsed as Best Management Practice (BMP).

NGOs were extremely concerned to read the statement from ISFA that these BMP goals were “unachievable” and “unrealistic”. **Backsliding on only recently agreed goals by the Industry makes the value of dialogue with the Industry questionable, and reinforces NGO concerns that dialogue is being used as a cloak of respectability and a vehicle for postponing the firm regulatory action that is required from governments to protect wild Atlantic salmon from the impacts of salmonid aquaculture.**

The NGO conclusion is that the salmon aquaculture industry should concentrate on delivering real, measurable and visible progress towards those targets, which is an essential step by NASCO governments in measuring that progress, rather than attempt to undermine and discredit the Focus Aquaculture Review.

20. **The accredited NGOs at NASCO fully support the Aquaculture FAR Group report, and call on the Parties at NASCO to endorse it, with minor modifications as suggested.**
21. **Anything less than full endorsement will expose the organisation and its governments to public ridicule in the wider community of wild Atlantic salmon conservation interests.**

IP(10)36

Comparative overview of approaches used to address challenges in minimising the adverse impacts of salmon aquaculture, introductions and transfers and transgenics on wild salmon stocks

1. Introduction

Salmon aquaculture is defined as the culture or husbandry of Atlantic salmon, including salmon farming, salmon ranching and salmon enhancement activities. Since the early 1980s, farming of Atlantic salmon has become a major industry in the North Atlantic and other parts of the world. Production of farmed salmon in the North Atlantic has increased from around 5,000 tonnes in 1980 to more than 1,000,000 tonnes in 2009. The 2009 production is approximately 1,000 times the declared harvest of salmon in fisheries in the North Atlantic region. The Review Group believes that the scale of the salmon farming industry means that it has the potential to be more damaging than other aquaculture practices although poorly planned stocking practices and other forms of introductions and transfers also pose significant genetic and other risks to the wild stocks, as highlighted by recent research. The damage caused by the introduction of the parasite *Gyrodactylus salaris* to Norway highlights these risks.

There is variety in the type and magnitude of aquaculture related activities in which NASCO's jurisdictions are engaged. In some jurisdictions, the salmon populations are dependent on stocking programmes while in others there may be no stocking of salmon at all. Some jurisdictions have an enormous production of farmed Atlantic salmon whereas other jurisdictions have none. The size and status of the wild salmon populations across the jurisdictions also varies with some jurisdictions working to restore extinct populations or to prevent the extinctions of populations (including those designated to receive special government protection) whereas others have populations that still support significant, albeit reduced, fisheries.

Since 1990, NASCO has co-convened three major international symposia to ensure that it had the best available information on interactions between wild and reared salmon to guide its decisions. The most recent NASCO/ICES symposium held in Bergen in 2005 highlighted that while much progress had been made in addressing impacts of aquaculture and in better understanding the nature of these impacts, sea lice and escaped farmed salmon were identified as continuing challenges both for the salmon farming industry and the wild stocks and on which further progress was urgently needed. In response to these concerns, NASCO 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, CNL(06)48, (hereinafter referred to as the 'Williamsburg Resolution'). This Resolution consolidated NASCO's previous agreements, that dated back to 1991, and included new elements (e.g. on the burden of proof, mitigation and corrective measures, and risk assessment) to ensure consistency with the Precautionary Approach. More recently, the Liaison Group established by NASCO and the International Salmon Farmers' Association (ISFA) has developed Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks, SLG(09)5, (hereinafter referred to as the 'BMP Guidance'). This Guidance, which was adopted by both NASCO and ISFA in 2009, is intended to supplement the

Williamsburg Resolution. It sets new international goals in relation to sea lice and escaped farmed salmon with the basic principle that ‘salmon stocks in areas with salmon farming should be in as healthy a state as those in areas without salmon farming’ (see document ATF(09)8).

The *Ad Hoc* Review Group (hereinafter referred to as ‘the Review Group’) has reviewed the aquaculture, introductions and transfers and transgenics FARs submitted to NASCO and has commented on the progress made by each jurisdiction in implementing the Williamsburg Resolution and the BMP Guidance. As part of its review, the Council also asked the Review Group to undertake a comparative overview of these FARs, highlighting common challenges and common management and scientific approaches to minimising adverse impacts on the wild salmon stocks so as to facilitate the exchange of information and transfer of knowledge on aquaculture issues envisaged in the Strategic Approach. This overview follows the format for the development of the aquaculture FARs agreed by the Council, CNL40.970. As this format combines reporting on both the Williamsburg Resolution, which deals with aquaculture, introductions and transfers and transgenics, and the BMP Guidance, which deals only with salmon farming, there is inevitably greater focus on salmon farming. However, as indicated above the scale of the salmon farming industry and the most recent scientific advice presented at the Bergen Symposium suggest that it poses a significant threat to the viability of wild salmon populations.

2. Overview of activities, policy and management structures

Generally, most FARs provided a good overview of the activities, policy and management structures in place. However, in some FARs while a large amount of this information was presented there was little focus on the outcomes of measures taken to implement the Williamsburg Resolution and to demonstrate progress towards achieving the international goals to safeguard the wild stocks. While many FARs provided details of the legislation in place, few provided a clear evaluation of the effectiveness of the measures actually implemented. Conversely, several of the FARs comprised only the briefest of overviews that made it difficult to fully understand and, therefore, assess the measures in place.

The Review Group believes that it would be desirable that future FARs focus on outcomes and progress towards achieving the international goals so as to properly demonstrate whether or not salmon stocks in areas with salmon farming are in as healthy a state as those in areas without salmon farming.

3. Initiatives for international cooperation

The Williamsburg Resolution calls for cooperation among NASCO Parties in order to minimise the adverse effects to the wild salmon stocks from aquaculture, introductions and transfers and transgenics. Some FARs provided no information on these initiatives while others referred only to examples of cooperation within the jurisdiction. However, there are also some examples of both bilateral and multilateral international cooperation.

- The Scottish and Norwegian FARs indicate that a Memorandum of Understanding on Aquaculture Cooperation has been agreed that includes commitments to cooperate on fish health and welfare issues and on containment. There is also close cooperation in relation to the parasite *G.salaris*.
- The FAR for Sweden refers to cooperation with Norway and Finland in relation to *G.salaris* and on stocking of border rivers.

- The US FAR refers to close cooperation with Canada in developing the 1992 NAC Protocols for the Introduction and Transfer of Salmonids. Subsequently, in 2008, escape notification procedures were developed jointly. More generally, the US cooperates internationally through participation in scientific symposia, including the ICES/NASCO Bergen Symposium, and involvement in the NASCO/ISFA Liaison Group and its Task Force.

The Review Group noted that few FARs presented information relating to international cooperation between the jurisdictions on matters relating to minimising the impacts of aquaculture and related activities on the wild stocks and the outcomes of such cooperation. This aspect might be more clearly reported in subsequent FARs. The Review Group urges all jurisdictions with salmon farming to participate in the work of the NASCO/ISFA Liaison Group. It considers it vital that this Group has representation not only of the salmon farming industry and administrators and managers involved with salmon aquaculture but also of those responsible for the management and conservation of the wild salmon stocks.

4. Progress towards achieving the international goals for sea lice and containment

The BMP Guidance was developed to assist in strengthening the application and interpretation of the Williamsburg Resolution. The BMP measures in this guidance reflect those contained in the Williamsburg Resolution, and its predecessor the Oslo Resolution which was adopted in 1994. However, the BMP Guidance contains new international goals and sections on reporting and tracking and factors facilitating implementation as well as the BMPs. Under this Guidance the internationally agreed goals are: 100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms; and 100% farmed fish to be retained in all production facilities. For sea lice, the recommendations on reporting and tracking include the use of monitoring programmes to characterise the lice loads in the farms and wild salmonid populations; monitoring of lice loads on wild salmonids in areas with salmon farms compared to areas with no salmon farms; assessment of lice-induced mortality of wild salmonids (e.g. as monitored using sentinel fish, fish-lift trawling, using batches of treated smolts); and monitoring to check the efficacy of lice treatments. In relation to containment, the Guidance recommends reporting of the number of incidents of escape events and standardised descriptions of the factors giving rise to escape events; reporting of the number and life-stage of escaped salmon; and monitoring for the number of escaped salmon in both rivers and fisheries and the relationship to reported incidents.

The Review Group recognises that, as noted at the NASCO/ICES Bergen Symposium, progress has clearly been made in addressing the impacts of aquaculture on the wild stocks. However, the continuing growth of the industry poses significant challenges in protecting the wild stocks and a number of FARs recognise the need for further progress to address the impacts from sea lice and escapees. For example, under the Norwegian policy for the preservation of wild salmon, despite the progress made, sea lice and escapees from farms are still considered to be serious threats to wild salmon stocks. In most cases, data to demonstrate progress towards achievement of the international goals was not presented in the FARs. While many FARs provided information derived from monitoring programmes for sea lice on farms and on reported numbers of escapees, little information was presented from monitoring of wild salmon stocks that would enable the effectiveness of measures designed to protect them to be properly assessed.

- The FAR for Ireland indicates that the current national sea lice monitoring programme involves the inspection and sampling of each year class of fish at all fish farm sites fourteen times a year and target lice levels have been set for farms. These data are made available to all stakeholders. A number of approaches have been used to monitor lice levels on wild salmonids (see section 18 below). A new pest management strategy was introduced in 2008 to deal with incidences where target lice levels were not being met at farms. This strategy recognises that recently it has been more difficult to achieve the very low levels of infestation required by the national control programme, *inter alia*, because of a succession of warm winter sea temperatures, resistance of sea lice to treatments, limited access to ‘fallowing sites’ for temporal and spatial separation of stocks and other complicating fish health problems.
- The FAR for Northern Ireland indicates that there has been no necessity for treatment of lice at either of the two farmed sites over the last 20 years, as the sites have strong currents with consequent strong flushing of the cages. However, no information is presented on lice levels on wild smolts (only on returning adult fish).
- The Norwegian FAR indicates that while the reported number of escaped farmed salmon has decreased in recent years to approximately 175,000, in 2009 monitoring of spawning populations in 39 salmon rivers indicates that proportions of escaped farmed salmon remain high (around 15% in autumn samples with a slight increasing trend in recent years). The sea lice infestation levels in the industry were three times higher in September 2009 compared to the same period in 2008. During the winter of 2010, compulsory synchronised de-lousing was enforced at a threshold of 0.5 adult female lice per fish in January and of 0.1 for all stages in March/April, in order to ensure the lowest possible lice levels on farms when wild salmon smolts leave the rivers. However, resistance to emamectin benzoate and pyrethroids has been discovered along the Norwegian coast. It is also stated that the move to larger cage units, some capable of holding up to 500,000 farmed salmon poses challenges in controlling sea lice and preventing escapes. With regard to progress in eliminating the parasite *G.salaris*, a total of 35 rivers have been treated; in 21 the parasite has been successfully eradicated, five rivers are being monitored and in 9 rivers the treatments have been unsuccessful.
- The US FAR presents information from in-river traps showing that the number of farmed origin salmon entering US salmon rivers has decreased significantly since the implementation of containment management systems in farms.

The Review Group recognises that progress has been made by the salmon farming industry in introducing measures intended to minimise the impacts on wild salmon stocks. It concluded, however, that in spite of the wealth of regulations and measures demonstrated in the FARs relating to salmon farming, many FARs failed to provide information to demonstrate progress towards achieving the international goals for sea lice and escapees.

5. Process to demonstrate prior to approval that proposed activities will not have a significant impact on wild salmon stocks

With regard to the burden of proof, the Williamsburg Resolution states that each Party, in accordance with the Precautionary Approach, should require the proponent of a proposed activity to provide all the information necessary to demonstrate that it will not have a significant adverse impact on wild salmon stocks or lead to irreversible change. In all jurisdictions, an application to conduct salmon farming (or to expand production) is required and a range of information is required to support these applications. (It should be noted that any new aquaculture facilities are prohibited in salmon rivers in Sweden and in National Salmon Fjords in Norway). The following are examples of the information required to support applications to conduct aquaculture and introductions and transfers in various jurisdictions:

- The Irish FAR indicates that applicants for a salmon farming license are required to provide sufficient information to demonstrate that the proposed activity will not have a significant adverse impact on wild salmonid stocks. In practice all offshore finfish farming operations over 100 tonnes capacity are required to submit a comprehensive Environmental Impact Statement. Similarly, proponents wishing to release hatchery-reared salmon must also provide relevant information to facilitate a full evaluation of the impacts of stocking on the wild salmon stocks.
- The Norwegian FAR states that information is required, *inter alia*, on: the distance to other aquaculture facilities and rivers; the maximum standing biomass to be reared; arrangements for treatment of sea lice; contingency plans for handling high mortality and serious diseases; the disease situation in the area around the site; and the risk of spreading disease to wild fish.
- The FAR for Scotland indicates that applicants are required to submit sufficient information to allow consultees to advise on whether the proposed development is likely to have a significant effect on the environment including wild salmonids. Authorisation is granted where the operation of the farm is not considered to pose an unacceptable risk of spreading disease to other farms or to wild fish stocks.
- The US FAR indicates that proponents are required to identify the work they propose to conduct, describe how it is to be carried out, and to follow the sequence of identifying impacts, avoiding impacts, minimizing unavoidable impacts, and mitigating any remaining impact. For activities occurring in the GOM DPS, there is an even higher burden on project proponents to avoid impacts to the ESA listed species and/or designated critical habitat. Monitoring is required to ensure the level of the effects is not greater than anticipated at the outset of the project.

The Review Group has highlighted the frequent absence of wild salmon stock considerations in risk assessments (see section 6 below). This appears to be particularly the case with regard to the impacts of escapees on the wild stocks. Furthermore, risks assessments based on the ability to control lice levels on farmed fish may under-estimate the risks to the wild stocks.

6. Application of appropriate risk assessment methodologies including in relation to site selection

Risk assessment is integral to the implementation of the Precautionary Approach and serves to promote transparency in the decision-making process. The Williamsburg Resolution states that risk assessment should include identification of options and consideration of mitigation measures and that the Parties should develop and apply appropriate risk assessment methodologies in considering the measures to be taken in accordance with the Resolution. It is clear from many of the FARs that jurisdictions are applying risk-based assessment methodologies although the extent to which wild salmon stock considerations are included in these assessments varies. A number of the FARs also refer to risk-based approaches to monitoring and inspections in which farm sites that are considered to be at lower risk of non-compliance would receive less or no monitoring.

- Several FARs indicate that risk assessments are required prior to stocking hatchery fish. In England and Wales, both ecological and genetic risks must be assessed and considered acceptable before stocking with salmon will be permitted. The FAR for Ireland indicates that in assessing applications the licensing authority must consider, *inter alia*, the ecological impacts on wild fisheries, natural habitats, flora and fauna. This FAR also refers to recent experiments indicating that hatchery releases are likely to depress rather than enhance the productivity of natural populations suggesting that more caution and planning is required before hatchery reared progeny are released into the wild. The current supportive breeding programmes in Ireland are to be reviewed in the light of this scientific information.
- The FAR for Canada indicates that any proposed intentional introduction would require a risk assessment to evaluate the ecological and other impacts of introductions and transfers.
- The FAR for Scotland indicates that a series of computer modelling packages driven by local tidal, bathymetric and meteorological data are used in assessing risks from a proposed farm site. This modelling allows site-specific limiting conditions to be specified in authorisations to ensure that the impacts arising are within the carrying capacity of the local environment.
- The US FAR indicates that at the time of the ESA consultation, the option to relocate farm sites away from wild salmon rivers was considered, but alternative suitable sites could not be identified. Therefore, other risk reduction measures including compatibility of the equipment to the site conditions, a containment management system (using a Hazard Analysis Critical Control Point approach), audits, inventory control, a prohibition on the use of non-North American strain salmon and marking were all required.
- The Norwegian FAR indicates that the farm monitoring program is risk based (AkvaRisk) with all marine aquaculture sites categorized in three groups (low, medium and high risk). The control focus has been on the high-risk group except that all farms in National Salmon Fjords are monitored annually. Similarly, risk-based approaches to monitoring are referred to in the FARs for Scotland and Northern Ireland.

The Review Group highlights the frequent absence of wild salmon stock considerations, in risk assessments and strongly encourages all jurisdictions to incorporate these considerations into decision-making processes in future. Furthermore, the outcome of all risk assessments should be reviewed in the light of changes in the status of the wild stocks and any increase in production of farmed salmon. With regard to risk-based monitoring, the Review Group recognises that consistent with the Precautionary Approach, where high risk sites are identified measures should be taken to eliminate the risks posed to the wild stocks and their environment. Where low risk sites are identified, appropriate monitoring would help to confirm, or reveal changes in, their low risk status.

7. Development and Implementation of Action Plans to minimise escapes

Under the Williamsburg Resolution it is stated that each Party shall take measures to minimise escapes of farmed salmon to a level that is as close as practicable to zero through the development and implementation of Action Plans as envisaged under the Guidelines on Containment of Farm Salmon (Annex 3 of the Resolution). These Guidelines recommend that each jurisdiction has in place measures for minimising escapes; mechanisms for reporting information on the level and causes of escapes; and mechanisms for reporting and monitoring in order to assess compliance and to verify the efficacy of the measures taken. The Review Group considers that together these elements comprise an Action Plan. The guidelines are intended to prevent escapes of farmed salmon in both the freshwater and marine environments. They include elements on site selection, design of equipment and structures, management systems operation, verification, and development of action plans and reporting. Under the BMP Guidance, the international goal is that 100% of farmed fish are to be retained in all production facilities.

- A number of FARs refer to measures to prevent escapes from freshwater hatcheries. In Denmark the two hatcheries used in the stock rebuilding programme use recirculating water and it is stated that no escapes occur from these facilities. Several FARs refer to the use of grills on the outlets to prevent escapes. In the US commercial freshwater hatchery facilities located on rivers with endangered salmon populations are required to eliminate losses of juvenile salmon by screening discharges from the hatchery using a three barrier system. In Norway, commercial smolt hatcheries are not permitted in salmon rivers.
- The FAR for Northern Ireland indicates that sites are selected following a hydrodynamic study, the equipment deployed is designed to withstand the conditions at the sites, which are appropriately marked and depicted on Admiralty charts. Each net and cage has an identification number and maintenance records are compiled and inspected each month together with a physical inspection of the structures by remotely operated underwater vehicles. Predator deterrence equipment is required. Staff are trained, training records are maintained and containment measures are adopted during stocking, counting, grading, transport and harvesting of fish, net changes and cleaning. There is regular preventative maintenance including cleaning of cages and inspection by divers. No cages are towed with the nets assembled or containing fish. Records exist for each cage detailing all handling of fish and there is a requirement to report escapes and their causes. A contingency plan exists to permit the deployment of drift nets in the immediate vicinity and removal of farmed salmon from adjacent rivers by electrofishing.

- The FAR for Norway indicates that an Action Plan ‘Vision Zero Escapes’ was developed in 2006 with the aim of achieving its goal in two years but the timescale has been extended. Among the most important measures it contains are: strict technical requirements for equipment (NYTEK) which have been recently revised; a permanent commission of enquiry to investigate all escape episodes and give advice on prevention of further escapes; and verification by public inspectors and heavy fines for violation of regulations including failure to report escapes. Education and motivation are also elements. There is mandatory reporting of escapes and investigation of causes of loss. In 2009 a process to develop a new standard for land-based aquaculture installations, including commercial hatcheries, was initiated.
- The Review Group noted that while reporting of escape events appears to be a mandatory requirement in all jurisdictions, it is not clear if the small-scale ‘trickle losses’ are included in such reporting or if efforts are made to assess them at the end of the production cycle. It is also clear from the Norwegian FAR that there may be unreported escape events and obtaining complete data on escapes is a challenge.

8. Implementation of measures to minimise the impacts of ranched salmon

Salmon ranching is defined in the Williamsburg Resolution as the release of reared Atlantic salmon smolts with the intention of harvesting all that return. The Resolution states that the impacts of ranched salmon should be minimised by utilizing local stocks and developing and applying appropriate release and harvest strategies. Currently, there is no ranching being undertaken in the North Atlantic other than on an experimental scale. There has, in the recent past, been commercial ranching of salmon in Iceland; production peaked at approximately 500 tonnes in 1993 but commercial production has since ceased although there is increasing ‘ranching to the rod’, in which hatchery-reared smolts are released in rivers, e.g. the Ranga, to enhance angling. In 2009 the harvest by rods in Iceland of ‘ranched’ salmon was 42 tonnes. It is not clear how this activity would be categorised under the Williamsburg Resolution.

- The FAR for Ireland indicates that there has been experimental ranching in the Burrishoole system since the mid 1970’s in which returns have been captured either by rod and line or by an in-river trap. A similar operation has taken place on the River Screebe since the 1990s with returns intercepted by rods or by an in-stream trap. The Precautionary Approach is applied to ranching specifically to increase angling returns with, *inter alia*, the following recommendations applying: site location distant from rivers with wild populations; no harvests permitted outside of the river; location of the harvest station in the lower reaches of the river to give better access to fish during the season; in-river trap to remove all returning hatchery fish; all fish to be tagged and genetically typed; all stock to be disease free on transfer and release; and all stock to be vaccinated.

The Review Group notes that the issue of how ‘ranching to the rod’ would be categorised under the Williamsburg Resolution might need further consideration as it is possible that this activity could increase in future if marine survival rates improve.

9. Measures to minimise interactions from salmon enhancement activities

The Williamsburg Resolution states that each Party shall take measures to minimise the adverse genetic and other biological interactions from salmon enhancement activities, including introductions and transfers. Salmon enhancement is defined in the Resolution as the augmentation of wild stocks in individual river systems by the release of Atlantic salmon at different stages in their lifecycles. Under the Guidelines for Stocking Atlantic Salmon (Annex 4 of the Williamsburg Resolution), three types of river (Classes I, II and III) are defined on the basis of the extent to which salmon and their habitats have been affected by human activities. In addition to general guidelines applying to all classes of river, there are specific recommendations relating to stocking, ranching and other forms of aquaculture for each class.

- The FARs for several jurisdictions indicate that stocking of salmon rivers must use material sourced from the same river, although there may be exceptions where the salmon population has been lost. In England and Wales, as salmon brood stock are usually obtained from the wild, the impacts on the donor stock must also be considered. In France, the stocking policy has evolved from originally being based on imported eggs to using native strains but a significant challenge is the low number of returning spawners and their sex ratio. In Swedish West Coast rivers that are free of the parasite *G.salaris*, stocking of any salmonid is not normally permitted to reduce the risk of spreading the parasite. Similarly, stocking of salmonids in the River Teno in Finland is not permitted. In Norway, when stocking is conducted local stocks are used but, additionally, a plan is drawn up in each case to minimize possible adverse genetic and other biological effects.
- The FARs for Norway and Sweden indicate that salmon stocking is being replaced by habitat protection and restoration for stock rebuilding purposes.
- The US FAR states that standard mating protocols have been established using genetic information and evaluation for each individual brood fish collected from the wild. The protocols also include screening for aquaculture origin salmon prior to spawning. In addition, gene banking is employed at one federal hatchery for rivers in danger of extinction or at risk of genetic introgression from aquaculture origin escapes.

10. Implementation of measures to minimise the risk of diseases and parasite transmission to wild stocks e.g. area management, integrated pest management, single year class stocking and fallowing

Under the Williamsburg Resolution it is stated that measures should be taken to minimise the risk of disease and parasite transmission between all aquaculture activities, introductions and transfers, and wild salmon stocks. The BMP Guidance indicates that with regard to sea lice, best management practices should include: area management, risk-based, integrated pest management (IPM) programmes that meet jurisdictional targets for lice loads at the most vulnerable life-history stage of wild salmonids; single year-class stocking; fallowing; risk-based site selection; trigger levels appropriate to effective sea lice control; and strategic timing, methods and levels of treatment to achieve the international goal and avoid lice resistance to treatment.

- The Canadian FAR refers to the establishment of six major aquaculture Bay Management Areas in the Bay of Fundy in 2006. Under this 3-year site rotational system, each year one-third of all sites are left fallow while another third is receiving

smolts and the remaining third is harvesting fish. Within each area, salmon farmers coordinate health management activities of all farms. For example, only farmed salmon born in the same year may be raised within the same management area with the aim of preventing parasites or pathogens from being transmitted to disease-free incoming smolts.

- The FAR for Northern Ireland indicates that the two salmon farming sites are approximately ten miles apart and are operated independently and stocked and harvested on an alternate basis allowing a six week fallow period of each site between final harvesting and restocking.
- The Norwegian FAR reports that a synchronized winter delousing treatment program has been in place since 2007 (see section 4 above). While this had been deemed successful, as assessed by lice levels on out-migrating smolts, resistance to treatments has developed and less efficacious compounds are now being used. There is increasing interest in the use of wrasse but current knowledge suggests that use of these cleaner fish alone will not be adequate to protect wild fish. Wild stocks of wrasse are not adequate to supply the industry but commercial rearing is showing promising results although it will not be able to meet demand until 2013. There is mandatory reporting of all suspected or confirmed cases of reduced sensitivity or resistance of sea lice to any of the available treatment drugs.
- The US FAR states that integrated pest management protocols include monitoring of sea lice levels and evaluating treatment efficacy. The guidelines include BMPs that seek to reduce the need for use of chemicals or medications. Routine monitoring of sea lice populations occur at least bi-weekly when water temperatures are greater than 8°C, and monthly when water temperatures are between 6°C and 8°C. A maximum treatment threshold for sea lice counts is presently 1 gravid female and 5 pre-adult, on average, with a minimum of two samples. At the discretion of the licensed veterinarian, treatment may be initiated before such a count is reached. If appropriate, coordinated bay-wide therapeutic treatments are used to reduce initial infection.

11. Control of movements into a Commission area of reproductively viable Atlantic salmon or their gametes and of introductions into a Commission area of reproductively viable non-indigenous anadromous salmonids or their gametes

The Williamsburg Resolution states that movements into a Commission area of reproductively viable Atlantic salmon or their gametes and of introductions into a Commission area of reproductively viable non-indigenous anadromous salmonids or their gametes should not be permitted. It should be noted that in the case of the Faroe Islands and Germany there were either no native salmon stocks or the native salmon stocks have been lost, so the establishment or re-establishment of stocks required the use of non-indigenous salmon. In both cases, the material used had originated in the North-East Atlantic Commission area.

- A number of FARs confirm that these movements and introductions are either not permitted or do not occur. However, in some jurisdictions these movements and introductions into a Commission area have occurred under licence (e.g. Scotland, and Ireland). Some FARs refer to reproductively viable non-indigenous salmon, particularly rainbow trout, that were introduced historically for aquaculture purposes and that are now considered indigenous (e.g. in Canada) or where there is concern about escapes from farming but uncertainty about whether self-sustaining stocks have

been established (e.g. Norway). In Canada, the current rainbow trout policies authorize the use of rainbow trout only within the historical range of introductions and a similar situation exists for brown trout, though the geographic range of introduction and establishment is much less.

- The FAR for the Russian Federation indicates that the introductions of pink salmon from the Russian Far East during the 1930s and 1960-1990s have now ceased, although self-sustaining populations are present in all rivers in the Murmansk region. Furthermore, pink salmon adult fish are regularly observed in northern Norwegian rivers and spawning fish and fry have been observed in one Norwegian river.

12. Procedures to prevent introductions of non-indigenous fish into salmon rivers

The Williamsburg Resolution recommends that no non-indigenous fish should be introduced into a river containing Atlantic salmon without a thorough evaluation of the potential adverse impacts on the Atlantic salmon population(s) which indicates that there is no unacceptable risk of adverse ecological interactions. Non-indigenous is defined in the Resolution as not originating or occurring naturally in a particular environment; introduced outside its native or natural range. The information provided in the FARs refers to measures relating to both salmon and other species.

- Several FARs confirm that introductions of non-indigenous fish species into rivers containing salmon are not permitted while others indicate that there would be a strong presumption against releasing any non-native fish into rivers containing salmon.
- The FAR for Canada states that no new introductions or transfers of non-indigenous fish into the rivers in Atlantic Canada or Quebec containing Atlantic salmon have been approved since 2002. However, unlawful introductions have occurred e.g. of smallmouth bass, largemouth bass, chain pickerel and brown bullhead, and it is thought that these illegal introductions have negatively impacted a number of freshwater ecosystems in the region. Detection of such activities relies to a large degree on information from the public but actions have been taken in relation to violations (see also section 16 below).
- The FAR for France indicates that while an authorisation is required to introduce any fish not present in French watercourses, the list of species that do not need authorisation is based on fish present in France in 1985 and includes alien species including rainbow trout.
- The US FAR indicates that stocking of non-indigenous species into waters containing anadromous Atlantic salmon are widespread and authorized by the appropriate state agency having jurisdiction over these actions. Prohibitions on introducing non-indigenous fish (e.g. smallmouth bass, brown and rainbow trout) into rivers containing wild Atlantic salmon are not in place. In the case of ESA listed salmon populations, state managed programs receiving federal support would require a thorough analysis of any proposed introductions including identifying, evaluating and mitigating potential adverse impacts to the salmon population.

13. Application of the NASCO Guidelines for Action on Transgenic salmon

The NASCO Guidelines for Action on Transgenic Salmonids (Annex 5 of the Williamsburg Resolution) state, *inter alia*, that Parties should: take all possible steps to ensure that the use of transgenic salmonids is confined to secure, self-contained, land-based facilities; inform

salmon producers of the risks to wild stocks; and take steps to improve knowledge of the potential impacts of transgenic salmonids on wild stocks and their habitat. Most FARs indicate that there is no rearing of transgenic salmonids. While most jurisdictions with salmon farming have indicated that the industry is not in favour of rearing transgenics, and at the Liaison Group meeting ISFA has confirmed that it rejects the use of transgenic salmon, few FARs described clearly if the controls exist to ensure that use in the future is consistent with the NASCO Guidelines i.e. in secure, self-contained, land-based facilities.

- The FAR for Canada indicates that while no transgenic salmonids have been approved for commercial aquaculture, release, or consumption, research has been approved to rear transgenic salmonids in contained facilities to assess the environmental and human health risks, and the performance characteristics of the fish.
- The US FAR indicates that permits for the commercial culture of Atlantic salmon in net pens and freshwater hatcheries in the US prohibit the use of transgenic salmon. However, an application has been made to the Food and Drug Administration (FDA) for approval to sell transgenic salmon in the US. As part of the review process an Environmental Assessment will be required and a consultation is required under the Endangered Species Act to determine the potential impacts on endangered Atlantic salmon. The scope and complexity of the analyses will depend on the type of approval ultimately sought from the FDA – rearing in freshwater facilities in the US, rearing in marine waters in the US, or only sale of the fillets and whole fish in the US.

While the Review Group recognises that rearing of sterile, transgenic salmon in land-based facilities might reduce the risks of adverse impacts from sea lice and escapes compared to current practice, the availability of these fish raises issues that the Group believes should be thoroughly discussed by the Council. The Review Group is concerned about the additional risks that transgenic salmon could pose to the wild stocks if reared in sea cages. There will, therefore, be a need to ensure, as the Council intended, that any rearing in the North Atlantic area is restricted to secure, self-contained land-based facilities. However, it is not clear from the FARs if each jurisdiction has the legislation in place to require this. The Review Group considers that this element should be more clearly reported in subsequent FARs, particularly as approval may be given by the US FDA to market transgenic salmon. It might also be further discussed at the Special Session scheduled for the 2011 Annual Meeting. The Group understands that the consultations referred to in the US FAR have not yet taken place and the Group is aware of concerns that have been expressed that the FDA environmental assessment would not adequately address impacts on wild salmon stocks.

14. Development of river classification and zoning systems

Article 8 of the Williamsburg Resolution states that for the purpose of developing management measures concerning aquaculture and introductions and transfers, river classification and zoning systems should be developed as appropriate. Both the Guidelines for Stocking Atlantic Salmon (Annex 4 of the Resolution) and the North American Commission Protocols for the Introduction and Transfer of Salmonids (Appendix 1 of the Williamsburg Resolution) refer to river classification or zoning.

- The FAR for Northern Ireland states that all 27 salmon rivers have been designated as ‘salmonid’ rivers under the EU Freshwater Fish Directive and activities likely to have an impact on their native salmon populations would be restricted.

- The Irish FAR indicates that all rivers have been classified in accordance with the NASCO Guidelines for Stocking Salmon and that given the poor returns from extensive restocking programmes over the past decades and new evidence of the potential negative effects of using hatchery progeny for some restocking programmes, all restocking programmes are being reviewed.
- The Norwegian FAR indicates that all salmon rivers are classified on the basis of the extent to which they have been impacted by human activities, ranging from rivers that have lost their salmon stock to those that are only moderately or lightly affected by human activities and which do not require special attention. Norway has also designated 52 National Salmon Rivers and 29 National Salmon Fjords in which the salmon stocks are given special protection including a prohibition on the establishment of new aquaculture facilities or increase in the production of farmed anadromous or marine fish in existing facilities.
- The US FAR states that all salmon rivers have been classified in accordance with the NAC Protocols i.e. into three types: Class 1 (Pristine), Class II (Habitat alterations, non-indigenous wild or hatchery-reared Atlantic salmon populations), and Class III (Habitat alterations, non-indigenous fish species). In Maine both Class II and III rivers occur, but only Class III rivers occur elsewhere in New England.

The Review Group notes that while it is clear that many jurisdictions are developing river classification, e.g. under the EU Water Framework and Habitats Directives, few FARs referred to how river classification was used for developing management measures in relation to aquaculture and related activities. This element might be more clearly reported in subsequent FARs. The Group notes that where wild salmon 'protection areas' and 'aquaculture exclusion zones' have been established, there is a need to assess their effectiveness in protecting the wild stocks.

15. Procedures to initiate corrective measures where adverse impacts are identified and description of factors impeding implementation of the BMP Guidance

Where significant adverse impacts on wild salmon stocks are identified, the Williamsburg Resolution states that Parties should initiate corrective measures without delay and that these should be designed to achieve their purpose promptly. Mitigation measures can include activities to safeguard against potential future impacts (e.g. contingency planning, gene banks). For example, the Guidelines on Containment of Farm Salmon refer to the need for escape contingency plans, Annex 2 of the Williamsburg Resolution refers to the establishment of gene banks to protect against loss of genetic diversity and the 'Road Map' for *G.salaris* developed by the North-East Atlantic Commission refers to the need for contingency plans to be developed.

- The Canadian FAR indicates that a gene-banking program for Inner Bay of Fundy salmon populations was established in 1998 and a program has been developed to maximize the genetic diversity of the populations held. Several key populations are also being harboured and protected in DFO Biodiversity Centres in New Brunswick and Nova Scotia.
- The FAR for the Faroe Islands states that when heavy metal concentrations or organic matter in the sediments below salmon farms exceed prescribed levels operations may continue only when the seabed has recovered.

- Several FARs refer to the development of contingency plans in relation to *G.salaris* and escapes from salmon farms, including recapture efforts.
- The Norwegian FAR states that reporting of any reduced sensitivity to sea lice treatments is required and there are powers for the authorities to require reduction in biomass or slaughtering if the lice cannot be controlled; to extend fallowing; to prevent new smolt stocking; to ban the use of substances if resistance is detected; and ultimately to withdraw the licence to farm.
- The US FAR indicates that salmon farming facilities failing to meet permit conditions are required to initiate corrective measures to bring the facility into compliance before smolts can be transferred.

The Review Group considered that many FARs did not report clearly on this aspect and in others little information was presented on the nature of the measures to be taken to protect the wild stocks when unforeseen impacts are detected. It was also unclear if contingency plans had been tested in practice or their efficacy assessed. For future reporting, this important aspect of the Precautionary Approach should be addressed.

16. Research and data collection including monitoring programmes

The Williamsburg Resolution states that each Party should encourage research and data collection in support of the Resolution and take steps to improve the effectiveness of the measures contained in the Resolution. Annex 7 of the Resolution details the areas for research and pilot testing.

Sterile fish:

- The FARs for Norway and Scotland indicate that research is being undertaken into the development of triploid strains. The Liaison Group has been made aware of the *Salmotrip* project, a three year (2008 – 2010) feasibility study into triploid Atlantic salmon production. The project is funded through the EU Seventh Framework Programme and will provide new knowledge to support decisions on the potential implementation of triploid salmon within the salmon industry as a measure to minimise genetic impacts while improving fish welfare and food standards by maintaining a year-round high quality product that is acceptable to the consumer (see SLG(10)4).

Genetic methods:

- The FAR for Northern Ireland refers to an earlier study which showed that inter-breeding between wild and farmed salmon following an escape event had resulted in persistent genetic changes in the wild stocks although the significance of the changes was unknown.
- The FARs for Scotland and Norway state that studies are underway to better understand genetic structuring of wild stocks. In Norway, research is ongoing into the development of genetic markers to distinguish farm and wild salmon and to assess how much the genetic composition of wild salmon has been changed by escapees.

Intermingling:

- The FARs for several jurisdictions refer to monitoring programmes in fisheries, rivers or both to detect the occurrence of fish farm escapees. In the US, temporary weirs can be installed within 24 hours of any reported aquaculture escape.
- The Irish FAR indicates that investigations and industry surveys are being undertaken as part of an EU funded (FP7) project, 'Prevent Escape', which is examining the

extent and causes of potential and actual failures in containment at marine finfish farming operations in Ireland and the results will be used to advise on improvements.

Risk assessment:

- The FAR for England and Wales states that risk assessment protocols and management practices for the introduction of non-native fish species are under development.

Diseases and parasites:

- The FAR for Scotland states that a biophysical model of planktonic sea lice dispersal has been developed and is being validated. Geographical variations in sea lice burden on sea trout and the link to production on farms are being investigated.

Biological interactions:

- The FAR for England and Wales indicates that research into the impacts of intensive in-river aquaculture on wild salmonids is being conducted. An initial study, completed in 2007, investigated the effects of trout farms on both reproduction and smoltification in Atlantic salmon. A further study will be completed in 2014.

Production methods:

- The Canadian FAR refers to an industry-driven program funds research into best performance in fish production, optimal fish health, and industry environmental performance. The US FAR states that the efficacy of using Emamectin Benzoate (Slice®) for treating sea lice infestations has been evaluated. Additional new animal drug studies for alternative treatments are ongoing. Since 2006, the State of Maine DMR has been collecting data on the source and causes of losses from marine net pens and freshwater hatcheries.

Tagging and marking:

- The US FAR indicates that, since 2009, all farmed fish have required to be genetically marked.
- The Norwegian FAR states that DNA profiles are used to identify sources of unreported escapes (TRACES)
- The FAR for Scotland states that a tagging study was conducted to assess dispersal of escaped farmed salmon that showed a net easterly long-range dispersal.

The Review Group believes that further research and development on improved containment technologies (particularly closed containment systems), alternative approaches to the production of sterile salmon and commercial-scale trials with sterile salmon are urgently required. Similarly, in relation to sea lice there is a need for further research and development of vaccines and effective therapeutants, particularly given the evidence of resistance to existing treatments.

17. Development of educational materials to increase awareness of the risks of introductions and transfers

Article 12 of the Williamsburg Resolution recommends that educational materials should be developed and distributed to increase awareness of the risks that introductions and transfers of aquatic species may pose to wild salmon stocks and the need for measures that control these activities.

- The FAR for Canada indicates that programmes are run to educate anglers of the dangers of introducing non-native aquatic animals and plants. Materials have been developed to assist the public in identifying aquatic invasive species and warning of the dangers they pose to aquatic habitats and native species.

- The FARs for a number of EU jurisdictions refer to initiatives to increase awareness of the threats posed by the parasite *G.salaris* and the need to prevent its further spread. These include the use of roadside signs, videos/DVDs, webinars, press releases, establishment of disinfection stations, presentations at meetings and leaflets. In England and Wales, a website ‘efishbusiness’ has been established providing information on the regulations, guidance, news and the mechanism for applications to move fish.
- The Norwegian FAR refers to training courses that have been developed for fish farm personnel on escape prevention, and to guidelines that have been disseminated on effective sea lice treatment on farms and on the spread of *G.salaris*.

18. Evaluation of the effectiveness of the measures taken

A central theme of the Precautionary Approach is the assessment of the effectiveness of management measures taken and, where necessary, adaptation of these measures so as to safeguard the wild stocks. The need for adaptive management is also highlighted in the BMP Guidance in relation to salmon farming. While it is clear that various monitoring programmes are in place e.g. in relation to the distribution of *G.salaris* most FARs failed to describe programmes to assess the effectiveness of management measures and how the information derived is used in the management process. In this regard, the Review Group wishes to stress that while it may have indicated in the assessments that the measures taken are consistent with NASCO’s agreements, it cannot assess if the measures are effective in safeguarding the wild stocks. The BMP Guidance contains recommendations for reporting and tracking to support assessment of the progress made towards achievement of the international goals for salmon farming. The Review Group welcomes these recommendations which include monitoring of lice loads on wild salmonids in areas with and without farms; lice-induced mortality of wild salmonids and the efficacy of lice treatments, and the incidence of farmed salmon in the wild.

- The FARs for Denmark and the Russian Federation indicate that all or a proportion of stocked hatchery reared salmon are marked or tagged before release in order to assess return rate, mortality and contribution of stocked fish to the spawning stock. The FARs for England and Wales and the US indicate that monitoring is an integral part of stocking programmes.
- The FAR for Ireland indicates that in addition to monitoring for sea lice on farms, there is netting in estuaries to determine the sea lice infestation on prematurely returning sea trout and both live fish-lift trawling and surface gill-netting have been used to investigate sea lice levels on migrating post-smolts. Mortality of wild smolts due to sea lice has been investigated through releases of batches of fish treated with SLICE® and untreated controls.
- The Norwegian FAR refers to monitoring programmes for escaped farmed salmon in 39 watercourses. There is mandatory counting and reporting on a regular basis of sea lice burdens on farmed salmon, monitoring of lice levels on migrating smolts, and in 2010 a programme to monitor for resistance to sea lice treatment was scheduled to commence. A surveillance programme is in place to confirm the absence of *G.salaris* from areas with parasite-free status. The effectiveness of the National Salmon Rivers and Salmon Fjords will be assessed ten years after their establishment.

The Review Group believes that for future reporting, it will be essential that there is clear presentation of the outcomes of the monitoring in support of the BMP Guidance in order to assess progress towards the international goals.

19. Application of socio-economic factors in relation to attainment of NASCO's objectives

NASCO's Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach, CNL(04)57, provide a framework for incorporating social and economic factors into decisions which may affect the wild Atlantic salmon and the environments in which it lives. They state that the means by which social and economic factors may be incorporated in decisions under the Precautionary Approach is through socio-economic impact assessments, and that in the guidelines, the purpose of such assessments is to support and inform decision-making, rather than providing a mechanism for making the decision. The objective of the Williamsburg Resolution is to minimise the possible adverse impacts of aquaculture, introductions and transfers and transgenics on the wild stocks, while recognising the benefits, including the socio-economic benefits, which have resulted from the development of salmon aquaculture. Thus, the NASCO Resolution and Guidelines do not make it clear how decisions relating to aquaculture, introductions and transfers, and transgenics are to be taken when there are conflicting socio-economic and conservation issues to be considered. While some FARs referred to the social and economic values associated with the salmon farming industry, they did not refer to the economic values associated with the wild stocks which also need to be taken into account in management decisions and most FARs failed to indicate how socio-economic factors are incorporated into management decisions.

- The FAR for England and Wales indicates that the majority of stocking of either native or non-native species is to maintain, improve or create fisheries, which will have both social and economic values. However, regardless of the purpose, stocking and transfers will only be permitted if the ecological and fish health conditions are met, and there is a presumption that requirements for stocking should not override the maintenance of good ecological conditions.
- The FAR for Scotland indicates that stocking of non-natives can support the maintenance and development of fisheries for socio-economic purposes. However, to balance these needs against the risks, nearly all stocking of non-native species is normally restricted to enclosed, artificial or highly managed fisheries, and there is a presumption against permitting any stocking that would compromise the maintenance of good ecological conditions in natural waters.
- The US FAR states that when determining whether or not a species qualifies for protection under the Endangered Species Act, the Services are to make their determinations based solely on the best scientific and commercial data available; consideration of economic impacts is not permitted. Further, if a project is determined to jeopardize the continued existence of a species listed under the ESA, the Services cannot authorize any take and instead must identify an alternative project that would not result in jeopardy.

The Review Group noted that most FARs did not provide a clear indication of how socio-economic factors are incorporated into management decisions (this was also noted by earlier Review Groups in relation to the management of salmon fisheries and habitat protection and restoration). For future reporting this aspect should be addressed.

20. Conclusions

This overview highlights the wide range of approaches that are being used by jurisdictions in attempting to minimise impacts of aquaculture, introductions and transfers and transgenics on the wild salmon stocks. In its report, the Review Group recognises the progress that has been made in this regard. However, it is clear that significant challenges remain not least given the statements made in the FARs about the detection of resistance of sea lice to SLICE® and pyrethroids, the apparent increased abundance of lice related to warmer water temperatures, the increasing size of cage units etc., and the continuing high levels of escaped farmed salmon in rivers and fisheries in some jurisdictions. The possible approval of transgenic salmon in the US may pose new challenges and possibly opportunities to address impacts of salmon farming. There are also significant challenges related to stocking and introductions and transfers, not least those in ensuring that *G.salaris* is not spread to areas currently free of the parasite.

One of the purposes of the 'Next Steps' process is to facilitate information exchange among the jurisdictions. The Review Group has made recommendations that should facilitate improved information exchange the next time the Council focuses on aquaculture and related issues. In this regard, the Group believes that it would be desirable that future FARs focus on outcomes and progress towards achieving the international goals.

CNL(11)12

Report of the 'Next Steps' for NASCO Review Group

1. Commencing in 2004, NASCO undertook a comprehensive and critical review of its work which resulted in the adoption of a Strategic Approach for NASCO's 'Next Steps', CNL(05)49. This Strategic Approach contained recommendations for actions relating to three main challenges: implementation, commitment and accountability; transparency and inclusivity; and raising NASCO's profile. The Council moved rapidly to address these challenges. Last year, the Council agreed to review the 'Next Steps' process to highlight what it had delivered, where it had worked well and to recommend any actions required to ensure that the Strategic Approach had been implemented. Accordingly, a 'Next Steps' for NASCO Review Group was established and the report of its meeting is attached.
2. The Group first reviewed progress in implementing the Strategic Approach under each of the seven challenges it identifies. The Group recognised that while NASCO has moved quickly in implementing the measures in the Strategic Approach these relate mainly to process. The Group made some recommendations for further actions relating to these challenges and has proposed that additional feedback be sought during the Special Session at the 2011 Annual Meeting with a view to updating the Strategic Approach.
3. For the next cycle of reporting, the Group suggests some streamlining and in the next round of Implementation Plans it recommends that greater emphasis should be placed on the activities and actions each jurisdiction plans to take over a period of five years. There should be greater emphasis on monitoring and evaluation of activities with clearly describe identifiable, measurable outcomes and timescales. It is recommended that, in future, Focus Area Reports should be developed around specific themes and that progress on Implementation Plans could be assessed through the Annual Reports, which would be reviewed. The establishment of a Working Group to develop a framework for future reporting and evaluation is proposed, which would report back to the 2012 Annual Meeting.
4. The Review Group considered the response from ISFA regarding the evolution of the Liaison Group and believes that the Council should resolve the future role it envisages for NASCO with regard to aquaculture, introductions and transfers and transgenics before responding to ISFA. An initial discussion document on this topic will be tabled at the Annual Meeting. The Review Group also asked the Secretariat to prepare a paper looking at the costs and benefits of different meeting options and possible changes to the agendas for future Annual Meetings. Further, the Group asked the President and Secretary to develop draft Terms of Reference for the external performance review to be conducted in 2012.
5. The Council is asked to consider the report of the 'Next Steps' Review Group and decide on appropriate action. This is an important issue for NASCO, charting as it will its future approach to addressing the challenges in the Strategic Approach with the aim of restoring abundant Atlantic salmon stocks throughout the species' range so as to provide the greatest possible benefits to society and individuals.

Secretary
Edinburgh
7 April 2011

Report of the Meeting of the 'Next Steps' for NASCO Review Group

Nine Zero Hotel, Boston, USA

21 - 22 March 2011

1. Opening of the Meeting

- 1.1 The President of NASCO and Chair of the Working Group, Ms Mary Colligan, opened the meeting and welcomed participants to Boston. She noted that the important task before the Group was to evaluate the changes that have been made in the light of NASCO's very thoughtful and in-depth 'Next Steps' review of its Convention, mandate, structure and activities to ensure its continued fitness for the current and anticipated future challenges of Atlantic salmon conservation and management. She indicated that through a process of self-examination and stakeholder engagement that started approximately seven years ago, three areas of NASCO's work were identified for improvement: implementation, commitment and accountability; transparency and inclusivity; and raising NASCO's profile. NASCO had adopted a Strategic Approach to implement significant changes in order to advance these three goals. She noted that while the review may have resulted in change, the Review Group would need to question whether those changes have been effective. Effectiveness can be measured in multiple ways. The Group could question whether NASCO has furthered the three main objectives. However, even if NASCO can positively answer these questions, the ultimate metric must be the status of wild Atlantic salmon. She noted that the emphasis over the past reporting cycle was on demonstrating compliance with NASCO agreements and guidelines and perhaps the next cycle should be focused on outcomes. She thanked the members of the Review Group for taking time out of their busy schedules to participate in the review.
- 1.2 Ms Patricia Kurkul (USA) noted that the 'Next Steps' process was intended to be iterative; changing over time on the basis of experience gained. Overall, it represented a major step forward for NASCO and moving forward the process could be improved if there was greater focus on outcomes and effectiveness of the measures taken.
- 1.3 Mr Alan Gray (European Union) agreed with the sentiments expressed by the Chair and noted that while much has been achieved, further work is needed to build on the foundation laid. He indicated that in addition to planning how to take the process forward through this internal review, there would also be an external assessment in 2012 of NASCO's work to date.
- 1.4 Mr Richard Nadeau (Canada) indicated that he was pleased to be joining the work of NASCO at such an interesting time in its development.
- 1.5 Mr Steinar Hermansen (Norway) indicated that he was looking forward to strategic discussions rather than focusing on detail and, in this regard, he believed that consideration of the recommendations on future reporting and evaluation were the

most important. He noted that the recommendations from this Group would need to be carefully considered at the Annual Meeting in Greenland.

- 1.6 Mr Chris Poupard (NGOs) indicated that in 2004 the NGOs had played a central role in initiating the 'Next Steps' process. He thanked the Parties for their willingness to embrace the changes to NASCO's working methods and the Secretariat for its assistance. However, the NGOs felt that the agenda for the meeting could have been radical. While there have been some significant achievements as a result of the 'Next Steps' process, particularly with regard to transparency and inclusivity, there now needed to be much greater focus on outcomes. The principal conclusion, looking at the results of the 'Next Steps' process, is that there have been no material improvements in salmon conservation. The NGOs believe that there is a need to strengthen the Convention to improve implementation of NASCO's agreements and achievement of NASCO's objectives.
- 1.7 The Secretary reported that apologies had been received from both the Russian Federation and Denmark (in respect of the Faroe Islands and Greenland).
- 1.8 A list of the members of the Review Group is contained in Annex 1.

2. Adoption of the Agenda

- 2.1 The Review Group adopted its agenda, NS(11)5 (Annex 2) after agreeing to include three new items on 'Consideration of the need to amend the NASCO Convention' (item 9) and 'NASCO's meeting schedule and structure' (item 11) and 'Response from ISFA on future Liaison with NASCO' (item 12).

3. Consideration of the Terms of Reference

- 3.1 The Review Group's Terms of Reference are contained in document CNL(10)48. The Group had been asked to:
 - (a) review the 'Next Steps' process, highlighting what this process had delivered, where it had worked well and making recommendations for any actions required to ensure that all the recommendations in the Strategic Approach for NASCO's 'Next Steps' have been implemented;
 - (b) review the process used for reporting and evaluation of these reports and advise on any changes for the next reporting cycle;
 - (c) identify any additional areas that might need to be addressed to ensure that NASCO can meet the challenges it faces in managing and conserving Atlantic salmon;
 - (d) review the consistency of the 'Next Steps' review with UN General Assembly Resolution 61/105, and identify any further actions that might be required in accordance with the relevant provisions of this Resolution relating to RFMOs; and
 - (e) develop proposals for consideration by the Council on TORs, criteria and a budget for the external review. The attached annex could provide the basis for the development of such criteria and the Group could also consider TORs used by other RFMOs.

- 3.2 The Review Group was asked to complete its work no later than 1 April 2011 so that its report could be circulated to the Parties and accredited NGOs prior to the Twenty-Eighth Annual Meeting. The Review Group was also asked to present an overview of its findings during a Special Session at the Twenty-Eighth Annual Meeting to allow for an open debate and feedback from all delegates.

4. Overview of NASCO's work to date and the 'Next Steps' Process

- 4.1 The Secretary presented an overview of the work of NASCO since the Convention entered into force in 1983, NS(11)6. He indicated that prior to 1984, there was no international forum for cooperation on Atlantic salmon conservation and management and highlighted the following achievements:

- The NASCO Convention established a vast protection zone, resulting in the closure of the Northern Norwegian Sea salmon fishery which at its peak took around 1,000 tonnes of salmon.
- Diplomatic and other action by NASCO and its Parties successfully addressed the problem of fishing for salmon in international waters that developed in the late 1980s.
- Regulatory measures developed in NASCO have resulted in major reductions in the harvests in distant water fisheries which today only harvest around 25 tonnes (2% of the total catch).
- There have also been enormous reductions in fishing effort all around the North Atlantic because the Convention requires that States of Origin 'put their own house in order' before expecting other States to make sacrifices.
- There has been a marked change in recreational fisheries with the transition to 'catch and release' angling which NASCO has supported.
- The existence of NASCO has given a major boost to the development of scientific advice on salmon developed through ICES. This advice has informed management decisions in NASCO.
- There has been greatly increased exchange of information, for example, on social and economic data and on unreported catches.
- NASCO was one of the first international fishery organizations to introduce the Precautionary Approach to its work and agreements and guidelines have been developed on management of salmon fisheries; habitat protection and restoration; aquaculture and related activities and other topics.
- A process for Liaison with the Salmon Farming Industry was established and then led to jointly agreed BMP Guidance relating to sea lice and containment.
- There has been much work in the Commissions of NASCO on issues such as *G.salaris*, acidification etc.

- A major, multi-million pound, innovative research programme on salmon at sea has been implemented, with only ‘pump priming’ funds from NASCO.
- 4.2 He concluded that NASCO has a record of which it can be proud but changes in the marine environment have been a challenge to stock re-building initiatives. The situation would, however, have been considerably worse without the progress made. He noted that the challenge ahead for the Review Group is to plan out what additional steps may be needed to ensure the future of this iconic and valuable resource.
- 5. Implementation of the Strategic Approach and recommendations for future actions**
- 5.1 The Review Group considered document NS(11)2 (Annex 3) which provided an assessment of the progress in implementing each Decision and Key Issue in the Strategic Approach, CNL(05)49. This paper concluded that the ‘Next Steps’ process had resulted in major changes to the nature of NASCO’s work which is now conducted in a more transparent and inclusive manner. The majority of the decisions in the Strategic Approach have either been implemented or significant progress is being made. In particular, there is now far more transparency and greater accountability of the measures taken by jurisdictions in accordance with NASCO’s agreements, and progress is also being made in raising NASCO’s profile. While the first phase of implementation had focused on describing the actions being taken to comply with NASCO’s agreements, future reports could focus more on the effectiveness of these measures. There are only two decisions which have not been implemented; arranging a Ministerial Conference and holding follow-up stakeholder meetings. With regard to the Ministerial Conference, it had been recognized that this might only be required if a specific need arose and in this case it would be important to have clear objectives. With regard to stakeholder consultation meetings, the greater involvement of NGOs in NASCO and the enhancement of the websites may reduce the need for further consultation meetings. Progress is being made on most of the key issues although there has been limited progress on initiatives for endangered salmon populations.
- 5.2 The Review Group recognised that NASCO had moved quickly in adopting the Strategic Approach and implementing the measures it contains, although some different views were expressed about the extent of implementation of some of the decisions and key issues as reported in NS(11)2. The Group noted that many of the key issues identified for each challenge related to the process and not to outcomes which the Group agreed should be the ultimate objective. The Group recognised that while there had been major improvements in transparency and inclusivity and commitment to NASCO’s agreements the focus of reporting to date had been on measures taken and not their effectiveness. However, in other areas such as socio-economics, while there had been progress, further work is needed. The Review Group agreed that it would consider progress on each of the seven challenges identified in the Strategic Approach with a view to highlighting where further action was required to ensure the Strategic Approach was fully implemented. The view was expressed that it was important to focus on those aspects of the Strategic Approach where international cooperation through NASCO could make a significant contribution in supporting the conservation effort of the jurisdictions. It was noted

that in Norway, the NASCO Guidelines relating to management of fisheries had been very useful and SALSEA had been a great success whereas NASCO's work relating to socio-economic aspects had been less valuable.

Challenge 1: Management of salmon fisheries

- 5.3 The Review Group recognised that there had been substantial progress in the management of salmon fisheries and in improving 'fairness and balance' but the assessment of the FARs had indicated the need for additional actions in 11 of the 12 jurisdictions whose FARs were reviewed. While the 5 key issues relating to management of salmon fisheries remain valid, the Group recognised the need for further progress to address the additional actions highlighted by the FAR Review Group. The fisheries management guidelines adopted in 2009 should assist jurisdictions in making further progress in implementing NASCO's agreements and with future reporting.

Challenge 2: Social and economic aspects of the Atlantic salmon

- 5.4 It was noted that work is on-going in order to compile social and economic information relating to Atlantic salmon for inclusion on the NASCO website. The Review Group recognised that while some information on the economic value of salmon had been provided in the FARs very limited information had been included on how jurisdictions incorporate social and economic factors in management decisions. It was agreed that NASCO could provide a useful forum for exchange of information on how different jurisdictions are incorporating social and economic factors in managing their salmon resource and the Council has agreed to hold a Special Session on this topic at its 2012 Annual Meeting. Proposals for this Special Session are being developed by a Sub-Group of the Socio-Economics Working Group. The Review Group suggested that it would be valuable to consider not only case studies on how social and economic factors are included in decisions relating to each of the three focus areas but to have discussions on the value of NASCO's social and economic guidelines and what NASCO's future role on this topic might be.

Challenge 3: Research on salmon at sea

- 5.5 The Review Group considered that the key issues in the Strategic Approach relating to research on salmon at sea had been implemented and that the SALSEA Programme has been a highly successful public/private initiative that had allowed important research on salmon at sea to be conducted. The findings will be presented at the Salmon Summit in October 2011 and the management implications of this research reported back to NASCO in 2012. The Council will then need to consider if further actions are required. The Review Group believes that the research inventory relating to mortality of salmon at sea that is maintained by the IASRB is a very useful initiative and that the Board might consider if NASCO might play a broader role in providing a forum for coordination of research of relevance to NASCO's work.

Challenge 4: Protection and restoration of Atlantic salmon habitat

- 5.6 The Review Group recognised that there had been some significant gains through restoration of degraded habitat and that these might be highlighted to serve as models for initiatives on other rivers. However, the assessment of the FARs had indicated the need for additional actions in 9 of the 13 jurisdictions whose FARs were reviewed. It was recognised that NASCO's Habitat Plan of Action is vague and that most habitat issues are a matter for the jurisdictions. It was felt that the habitat guidelines adopted in 2010 may assist jurisdictions in making further progress in implementing NASCO's agreements and with future reporting.

Challenge 5: Aquaculture, introductions and transfers and transgenics

- 5.7 The assessment of the FARs had indicated the need for additional actions in 9 of the 13 jurisdictions whose FARs were reviewed. The Group considered that the BMP Guidance on sea lice and containment adopted by NASCO and ISFA in 2009 may assist jurisdictions in making further progress in implementing NASCO's agreements and with future reporting but there might also be improved guidance on other aspects of reporting e.g. in relation to transgenic salmon. The Group considered that key issue 7 ('Consider the consequences of aquaculture of Atlantic salmon in countries that are not parties to NASCO') may not be required if the Strategic Approach was revised in future.

Challenge 6: Gyrodactylus salaris

- 5.8 The Review Group noted that there had been limited reporting in the FARs on progress in implementing the North-East Atlantic Commission's 'Road Map' that contains recommendations on enhancing cooperation on monitoring, research and exchange of information and for strengthened national and regional legislation and measures to prevent the further spread of the parasite. It was, however, noted that the additional guarantees relating to *G.salaris* under the EU Fish Health Directive would continue to apply and this was an important development. While there is an item on the Commission's agenda relating to *G.salaris*, limited information had been presented. The Review Group agreed that given the risks posed by the spread of this parasite, further exchange of information among the jurisdictions is important and that future reporting under the Implementation Plans may be the most appropriate way to facilitate this exchange. It was recognised that *G.salaris* is a specific issue, that was highlighted in the Strategic Approach, but in the event that the Strategic Approach is revised in the future, the Group recommends that the goal and key issue relating to *G.salaris* be incorporated in Challenge 5 (Aquaculture, introductions and transfers and transgenics).

Challenge 7: Initiatives for endangered salmon populations

- 5.9 The Review Group discussed the merit of having separate key issues in the Strategic Approach relating to initiatives for endangered salmon populations and believed that the exchange of information sought by NASCO might be achieved by developing guidance on reporting on this aspect under each of the three focus areas: management of fisheries; habitat protection and restoration; and aquaculture and related activities. The Group did consider that the stock categories used in the NASCO rivers database

were now out-dated and that consideration should be given to reviewing these in the future. The Review Group felt that consideration might be given to including the goals and key issues relating to initiatives for endangered salmon populations under the other challenges if the Strategic Approach is revised in the future.

- 5.10 The Review Group recommends that the Council seek additional feedback on these challenges at the Special Session to be held at the 2011 Annual Meeting with a view to updating the Strategic Approach.

6. Reporting and Evaluation of Reports and recommendations for the next reporting cycle

- 6.1 The Review Group considered document NS(11)3 (Annex 4) which provided a review of the process used for reporting and evaluation of the reports. This had probably been the most comprehensive review of Atlantic salmon conservation efforts of all Parties ever conducted. The Parties should be congratulated for their willingness to put their conservation work before an international jury which had been a brave step. This document concluded that, with some adjustments, the Focus Area Review process should serve NASCO well in the future, but it would benefit from more consistency in reporting and a much greater focus on outcomes. Some streamlining should make the work of submission less onerous and the development of Guidelines on all three focus areas (fisheries management, habitat and aquaculture) in the first cycle should assist in the preparation of future Implementation Plans and FARs and their evaluation. The issues raised in document NS(11)3 would need to be addressed in any future reporting cycle.
- 6.2 The Review Group considers that the first cycle of reporting under the ‘Next Steps’ process had created a sound basis for assessing the measures being taken in accordance with NASCO’s agreements and had highlighted where additional actions are needed. It had led to a valuable exchange of information among the jurisdictions. While the first cycle of reporting had focused on the process, the Review Group agreed that the next cycle should build on the strong foundation that has been laid and focus on: changes since the last reporting; measurable progress towards agreed objectives; and furthering information exchange.
- 6.3 In the next cycle of reporting, the Group recommends streamlining the process so as to reduce the reporting burden, avoid duplication and focus the reports and reviews on information and analysis to further NASCO’s objectives of conserving, restoring, enhancing and rationally managing salmon stocks in the North Atlantic. The Group believes that it would assist the streamlining of future reporting if templates were developed to facilitate the development of consistent plans and reports and the possibility of electronic reporting should be considered. This work could be conducted by the Working Group recommended in paragraph 6.5 below. The Group considers that the Implementation Plans are the key document in the next reporting cycle in which each jurisdiction should describe the activities and actions it intends to undertake over a five year period. The second round of Implementation Plans should place greater emphasis on monitoring and evaluation of activities and describe clearly identifiable measurable outcomes and timescales. In developing updated Implementation Plans it is envisaged that jurisdictions will use their existing plans as a starting point and involvement of NGOs and other stakeholders is encouraged. The

findings from the first round of reviews should be taken into account in developing updated Implementation Plans. The Review Group recommends that these updated Implementation Plans should be subjected to a critical review since these plans will set the stage for activities and reporting for a five year period. The Group recommends that any plan that is not sufficiently specific should be returned to the jurisdiction for further drafting. It is proposed that each year the jurisdictions should provide a report identifying the status of actions within their plan as well as available data on monitoring the effectiveness of those actions. A review of the Annual Reports should be conducted to assess if the commitments in the plan have been fulfilled and whether progress has been made towards achievement of the stated objectives. The Council may wish to consider if presentation of these reports should be made in Special Sessions or during the Council sessions. Consideration should be given as to whether these annual reports should be reviewed by a Review Group and, if so, how frequently.

- 6.4 The Review Group also recommends that there should be a new cycle of Focus Area Reports but that these should be developed around specific themes e.g. during the year when the focus area is habitat protection and restoration the theme might be an exchange of information on fish passage issues. Reports may be solicited from jurisdictions and could be presented during the Special Session.
- 6.5 While the Review Group considers that the suggestions made in paragraphs 6.3 and 6.4 above provide a framework for future reporting there is a need to further develop these concepts and it recommends that the Council establish a Working Group to undertake this task and report back to the 2012 Annual Meeting. The Review Group recommends that, in the light of the experience from the first reporting cycle, the Terms of Reference for this Working Group should be as follows:
 - (a) Develop new guidelines for the preparation of Implementation Plans, drawing on document NSTF(06)10 but with greater emphasis on monitoring and evaluation and including criteria for acceptability, and guidelines for the preparation of Annual Reports. These guidelines should describe the content and format of these reports, the timing for submission of these reports, and the timing and process for distribution of these reports;
 - (b) Develop a process for the review of Implementation Plans and Annual Reports including the criteria to be used for the reviews, the timing of the reviews, the composition of the Review Groups, and arrangements for reporting on the reviews;
 - (c) Develop a schedule for the development and review of Implementation Plans, submission and review of the Annual Reports, and planning for and conduct of theme-based FAR Special Sessions.
- 6.6 The Review Group should report its findings to the Council at the 2012 Annual Meeting. At this meeting the findings of the external performance review will also be presented and the Council should then agree on arrangements for future reporting which could commence with the development and review of Implementation Plans in 2012/2013.

7. Identification of any additional areas to be addressed in meeting NASCO's challenges

- 7.1 The Review Group noted that in accordance with the Strategic Approach the Council had included an item entitled 'New or emerging opportunities for, or threats to, salmon conservation and management' to allow for feedback from the Parties, the NGOs and ICES. The Review Group recognised that climate change poses real challenges for salmon management that may require management approaches to be more flexible and adaptive to changes that may be difficult to predict. The Group was advised that, in Norway, the scientific committee has been requested to review the challenges for salmon management posed by climate change and there will be contributions at the 'Salmon Summit' in October on this topic. The Review Group recommends that the Council might, in the first instance, consider holding a Special Session on this topic in the future to allow for information exchange.
- 7.2 The Review Group noted that following the withdrawal of Iceland in response to the severe economic situation in that country, valuable information on the scientific and management issues was no longer available to NASCO. The Review Group recognised that the loss of Iceland from NASCO is a challenge as important information is no longer available to the Organization. The Review Group recommends that the Council ask that the President and Secretary engage in discussions with the former Head of Delegation for Iceland to keep him informed of the work of NASCO.

8. Consistency of the 'Next Steps' process with UN General Assembly Resolution 61/105

- 8.1 The Review Group's Terms of Reference note that during implementation of the recommendations in the Strategic Approach for NASCO's 'Next Steps', the United Nations' General Assembly had adopted Resolution 61/105 entitled 'Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments'. This Resolution, (hereinafter referred to as UNGA Resolution 61/105), includes recommendations concerning the performance of regional and sub-regional fisheries management organizations and arrangements and the Council, therefore, agreed that the Review Group should review the consistency of the 'Next Steps' process with UNGA Resolution 61/105, and identify any further actions that might be required in accordance with the relevant provisions of this Resolution relating to RFMOs.
- 8.2 The Review Group considered document, NS(11)4, which noted that NASCO has also already undertaken a very open performance review of its work and will be conducting a further external review after reviewing the 'Next Steps' process. Through the 'Next Steps' process, NASCO has rapidly implemented major changes to further increase its transparency and inclusivity, consistent with UNGA Resolution 61/105. Furthermore, NASCO has adopted the Precautionary Approach, and has either adapted its existing resolutions and agreements, or developed new ones, and has taken actions that are consistent with an Ecosystem Approach. The Group noted that while NASCO appears to have taken actions consistent with those described for

RFMOs in UNGA Resolution 61/105, the Terms of Reference for the external performance review include an assessment of the performance of NASCO against the objectives set out in its Convention and other relevant international instruments addressing the conservation and management of aquatic living resources including UNGA Resolution 61/105.

9. Consideration of the need to amend the NASCO Convention

9.1 Mr Poupard (NGOs) indicated that he had been requested by the NGO Group to raise the issue of possible amendments to the Convention. He advised the Group that all the accredited NGOs to NASCO supported the views he would express with the exception of the Salmon Net Fishing Association of Scotland, which felt that NASCO had successfully achieved its objectives and there was no longer a need for international cooperation on salmon matters. However, all the other accredited NGOs strongly supported NASCO and the need for enhanced international cooperation in future. He indicated that in 2004, the NGOs had proposed amending the Convention but this approach was not supported by the Parties. The NGOs are, however, aware that other RFMOs have done so with a view to meeting their obligations under UN and other international instruments. The reason for amending the NASCO Convention would be to improve salmon conservation. For example, he suggested that the ICES advice is clear with regard to mixed stock fisheries and yet these fisheries still exist in a number of homewater jurisdictions and it is recognised that there are difficult socio-economic issues related to these fisheries. If there was a mechanism to enforce NASCO's guidelines this might assist jurisdictions in achieving NASCO's goals. He referred to EU Directives and it was indicated that while these are binding it is a matter for the Member States to decide the means to implement them. He suggested this model might work with regard to NASCO's agreements.

9.2 The NGOs tabled a draft NGO position paper, NS(11)7 (Annex 5) which contained a range of possible changes that might be made to the Convention. The major issue concerned how to make NASCO's agreements more enforceable. Mr Poupard indicated that informal consultations suggested that some of these proposed changes may not be needed as they are already covered by the Convention. It was agreed that the Chairman of the NGOs will liaise with the NASCO Secretariat before finalising any proposals for changes to the Convention which could then be presented at the Council meeting in June. It was noted that the TORs for the external review would include consideration of the 'Next Steps' review so the NGOs' views would be available to the external review panel.

10. Proposals for TORs, criteria and budget for an external performance review

10.1 At its 2010 Annual Meeting the Council had agreed TORs, CNL(10)48, for an external performance review of NASCO that would assess the performance of NASCO since 1983 against the objectives set out in its Convention and other relevant international instruments addressing the conservation and management of aquatic living resources, taking into account *inter alia* the NASCO 'Next Steps' process and the criteria associated with UN Resolution 61/105. The TORs propose that the Review Panel should comprise three internationally recognized external experts and any additional individuals to facilitate the work of the Panel will be agreed at the 2011

Annual Meeting. The NASCO Secretariat will provide logistical support to the Review Panel.

- 10.2 With regard to a budget for external review, the Secretary advised the Group that the projected costs would need to be included in the proposed 2012 budget, which is likely to show a significant increase due to the need to include sums for recruitment of a new Secretary and his own retirement from NASCO.
- 10.3 The Review Group discussed possible composition of the external review Panel and asked that the Secretary contact organizations such as FAO and the UN Division of Ocean Affairs and the Law of the Sea (DOALOS) with regard to seeking nominees to serve on the panel. The Group recommends that the third expert should be a fisheries scientist, with management experience, and having no previous involvement with NASCO. It was agreed that the Secretary contact a scientific organization such as PICES to seek a third nominee. The Group considers that as this is an external review it is not appropriate for representatives of the NASCO Parties or NGOs to serve on the panel. The Review Group noted that the TORs contain an annex with criteria that might be used by the external Review Panel. However, it was noted that these had been developed for use by the tuna RFMOs and included elements that were not relevant to NASCO including those relating to the special requirements of developing States. There were also elements that related to human and financial resources that are already addressed annually by the Finance and Administration Committee. The Review Group, therefore, recommends that the President and Secretary develop draft TORs for the external review, taking into account document CNL(10)48 and drawing on those used by other RFMOs as appropriate, and including criteria appropriate to NASCO. The Council will review and agree TORs at the 2011 Annual Meeting.

11. NASCO's meeting schedule and structure

- 11.1 The Review Group discussed a number of options for changes to the structure, frequency and location of NASCO's Annual Meetings so as to achieve efficiency gains. It was recognised that this is a complex matter and the Secretariat was asked to prepare a paper looking at the costs and benefits of different meeting options and changes to the agenda for consideration by the Council.

12. Response from ISFA on future Liaison with NASCO

- 12.1 The Chair indicated that at the NASCO/ISFA Liaison Group meeting on 18 and 19 March there had been discussions about the evolution of the Liaison Group and a number of options had been considered for the future role of NASCO in relation to salmon farming. ISFA had agreed to consider these options further and report back to the Review Group. The Liaison Group had also suggested that the NGOs and industry should be involved in the development of any subsequent FARs on aquaculture and related activities. At that meeting ISFA had also stated its commitment to the BMP Guidance. The Secretary advised the Group that ISFA had responded and he read out the response which included the following statements:

- The International Salmon Farmers Association (ISFA) values the liaison that the Salmon Farming industry has maintained with the Parties of NASCO since 1999.
- ISFA remains committed to the Guiding Principles for Cooperation between NASCO and its Contracting Parties and the North Atlantic Salmon Farming Industry SLG(01)11.
- ISFA looks forward to the outcome of the NASCO ‘Next Steps’ process and welcomes recommendations from and direct discussions with the Parties regarding the future scope and structure of the Liaison Group.
- ISFA members share a vested interest in and contribute to the conservation of wild salmon.
- ISFA expects the Parties to engage their respective ISFA members in the development of their Delegation policies and positions regarding salmon.
- ISFA welcomes the offer to engage directly with the Parties through a seat at the NASCO Annual Meeting consistent with that afforded to the NGOs.

12.2 The Review Group was aware that the discussions at the Liaison Group meeting had concerned possible options for the evolution of the Liaison Group and not a formal offer to ISFA. The Review Group noted that following consideration of the aquaculture FAR Review Group’s report, the Liaison Group had proposed that NASCO Parties should carefully consider the extent of NASCO’s role with respect to aquaculture, introductions and transfers and transgenics. The Review Group had lengthy discussions about this role and various views were expressed. It agreed that before responding to ISFA on the matter of future liaison, which it welcomes, the Council should resolve the future role envisaged for NASCO on this issue, as soon as possible, with initial exchange and discussion at the 2011 Annual Meeting. The final decision would need to take into account the findings from the external performance review. An initial discussion document on this topic will be prepared for consideration at the Annual Meeting.

13. Arrangements for the Special Session

13.1 The Review Group agreed that it would finalise, by correspondence, the arrangements for the presentation at the Special Session to be held during the Twenty-Eighth Annual Meeting.

14. Any other business

14.1 There was no other business.

15. Report of the Meeting

15.1 The Review Group agreed a report of its meeting.

16. Close of the meeting

- 16.1 The Chair thanked the members of the Review Group for their contributions and closed the meeting.

List of Participants

Mary Colligan (Chair)	NOAA Fisheries, Gloucester, Massachusetts, US
Marco D'Ambrosio	European Commission, Brussels, Belgium
Arne Eggereide	Directorate for Nature Management, Trondheim, Norway
Alan Gray	European Commission, Brussels, Belgium
Steinar Hermansen	Ministry of Environment, Oslo, Norway
Peter Hutchinson	NASCO, Edinburgh, UK
Patricia Kurkul	NOAA Fisheries, Gloucester, Massachusetts, US
Richard Nadeau	Fisheries and Oceans Canada, Quebec, Canada
Brett Norton	Fisheries and Oceans Canada, Ottawa, Ontario, Canada
Ted Potter	CEFAS, Lowestoft, UK
Chris Poupard	Chairman of NASCO's NGOs, Truro, Cornwall, UK
Nicole Ricci	US Department of State, Washington DC, US
Rory Saunders	NOAA Fisheries, Orono, Maine, US
Sue Scott	Atlantic Salmon Federation, St Andrews, New Brunswick, Canada
Boyce Thorne-Miller	Northwest Atlantic Marine Alliance, Maryland, US
Malcolm Windsor	NASCO, Edinburgh, UK

NS(11)5

Agenda

1. Opening of the Meeting
2. Adoption of the Agenda
3. Consideration of the Terms of Reference
4. Overview of NASCO's work to date and the 'Next Steps' Process
5. Implementation of the Strategic Approach and recommendations for future actions
6. Reporting and Evaluation of Reports and recommendations for the next reporting cycle
7. Identification of any additional areas to be addressed in meeting NASCO's challenges
8. Consistency of the 'Next Steps' process with UN General Assembly Resolution 61/105
9. Consideration of the need to amend the NASCO Convention
10. Proposals for TORs, criteria and budget for an external performance review
11. NASCO's meeting schedule and structure
12. Response from ISFA on future Liaison with NASCO
13. Arrangements for the Special Session
14. Any other business
15. Report of the Meeting
16. Close of the meeting

NS(11)2

*Progress in Implementing the Strategic Approach for NASCO's 'Next Steps'***1. Introduction**

Commencing in 2004, NASCO undertook a comprehensive and critical review of its work. This review, called the 'Next Steps' for NASCO, identified the challenges facing NASCO in the management and conservation of wild Atlantic salmon and ways to address these; reviewed the management and organizational structure of NASCO; and considered the procedural aspects of NASCO and the relationship between the Organization, its Parties and stakeholders. This work was conducted by a Working Group comprising representatives of the Parties and the NGOs and involved open consultation meetings with stakeholders in Europe and North America. It resulted in the adoption, in 2005, of a Strategic Approach for NASCO's 'Next Steps', CNL(05)49, (hereinafter referred to as the 'Strategic Approach').

The stated vision in this Strategic Approach is that ***'NASCO will pursue the restoration of abundant Atlantic salmon stocks throughout the species' range with the aim of providing the greatest possible benefits to society and individuals'***. To achieve this vision, the Strategic Approach indicates that NASCO will: be committed to the measures and agreements it develops and actively review progress with implementation plans; increase its effectiveness and efficiency by ensuring that it uses the best available knowledge to inform its actions and by actively seeking to identify and respond to new opportunities and threats; ensure transparency in its operations and enhance the use of NGO and stakeholder knowledge and experience; and increase its visibility and raise its profile in international, national and local communities by developing its communications and public relations activities.

The Strategic Approach contains **decisions** in relation to three main areas:

- implementation, commitment and accountability;
- transparency and inclusivity; and
- raising NASCO's profile.

Many of the decisions in the Strategic Approach were identified for immediate implementation while others, requiring further consideration, were referred to a Task Force and decisions in relation to these elements were adopted by the Council in 2006.

The Strategic Approach also identifies the **challenges** facing NASCO in the management and conservation of wild Atlantic salmon, highlighting areas which would benefit from international cooperation. For each challenge, the Strategic Approach identifies the goal and key issues. The primary challenges identified are:

- managing salmon fisheries;
- social and economic aspects of Atlantic salmon;
- research on salmon at sea (including by-catch of salmon);
- habitat protection and restoration;
- aquaculture, introductions and transfers and transgenics (including *Gyrodactylus salaris*);

- initiatives for endangered species.

The ‘Next Steps’ Review Group has been asked, *inter alia*, to review the ‘Next Steps’ process, highlighting what this process had delivered, where it had worked well and making recommendations for any actions required to ensure that all the recommendations in the Strategic Approach have been implemented. In this review, a summary of the actions taken in relation to each **decision** and each **key issue** in the Strategic Approach is presented.

2. Progress to Date on the Decisions in the Strategic Approach

Progress to date in implementing the twenty-three decisions in the Strategic Approach is detailed in the paragraphs below and summarized in Table 1 on page 9 of this report.

Decision 1: The Council will keep its agreements under regular review and adapt them, in the light of new information as to their effectiveness.

In 1998, NASCO and its Parties agreed to adopt and apply a Precautionary Approach to the conservation, management and exploitation of salmon in order to protect the resource and preserve the environments in which it lives. As part of the process of applying the Precautionary Approach, NASCO reviewed its existing agreements, adapted them where required, and developed new ones (e.g. the Habitat Plan of Action). As a consequence, NASCO’s main agreements were all developed or reviewed in the period 2001 - 2004. A clear message arising from the 2005 consultation meetings was that NASCO had developed good agreements but there was a need for further progress with their implementation (see Decision 20 below).

During the review of the FARs (2008 - 2010), guidelines relating to the management of salmon fisheries, CNL(09)43, and to habitat protection, restoration and enhancement, CNL(10)51, were developed as a way of providing clarification for NASCO’s agreements. These guidelines should assist jurisdictions in making further progress in implementing NASCO’s agreements and guidelines, provide a basis for exchange of information, and assist in the preparation and review of subsequent FARs. Similarly, Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks, SLG(09)5, (hereinafter referred to as ‘BMP Guidance’), developed through the Liaison Group is intended to supplement the Williamsburg Resolution, and to assist in the management of salmon aquaculture and in the development of future NASCO Implementation Plans and aquaculture FARs. Thus, NASCO’s principal agreements have all recently been reviewed and new guidance developed. The reviews did not highlight any fundamental flaws or significant shortcomings but steps were taken to introduce improved, transparent reporting procedures and to supplement the agreements with guidelines. It is anticipated that this process of reviewing the agreements and guidelines will continue in the next cycle of reporting and review.

Decision 2: The Council will explore the feasibility of arranging a Ministerial Conference to strengthen the Parties' commitment to the conservation of wild salmon through the NASCO Convention.

The Council has not arranged a Ministerial Conference. The 'Next Steps' Task Force concluded that it would not be feasible to arrange such an event at that time (2006) and that clear objectives would be needed if such an event was planned in the future, e.g. to launch the Implementation Plans or the SALSEA programme, both of which have now occurred. However, actions have been taken to improve commitment to NASCO's agreements (see Decision 20 below). It was noted by the Task Force that there might also be opportunities to raise salmon-related issues when two or more Ministers meet.

Decision 3: The homewater Parties will inform the relevant NASCO Commission of the management measures established or envisaged and their expected effects.

One of the key issues identified in the Strategic Approach with regard to management of salmon fisheries was the need to explore opportunities to improve the fairness and balance in the management of homewater and distant-water fisheries. The Task Force had proposed that this element of reporting should be included under the annual reporting on the Implementation Plans. Denmark (in respect of the Faroe Islands and Greenland) had confirmed that this arrangement would be adequate to allow it to assess fairness and balance in management of fisheries and the Council adopted this approach to reporting. The Implementation Plans, FARs and the annual reports on Implementation Plans contain information on management measures in homewaters. However, it should be noted that the annual reports do not provide information on the expected effects of the measures and the FAR Review Groups have all concluded that most FARs generally failed to report adequately on the effectiveness of management measures. Subsequent reporting might need to be better focused on this aspect.

Decision 4: The Commissions of NASCO will consider whether regulatory measures for fisheries could be adopted, and scientific advice from ICES sought, on a biennial or multi-year basis.

The Task Force recognised that it would be beneficial to have multi-year regulatory measures, but that this may or may not be accompanied by a reduction in the frequency of scientific advice because of the importance of maintaining the scientific databases and ensuring availability of information on any change in abundance that would require changes to the measure. One of the reasons for seeking multi-annual advice would be to make more time available to the ICES Working Group on North Atlantic Salmon (WGNAS) to focus on other issues including factors affecting marine survival.

Since 2005, all requests to ICES have sought annual catch options or alternative management advice on a multi-annual basis for each Commission area. Three year regulatory measures were adopted by the West Greenland Commission in both 2006 (2006 – 2008) and 2009 (2009 – 2011). In the second and third years of these measures, a Framework of Indicators (FWI) is used to identify any significant change in the previously provided multi-annual catch advice. In the event that no significant change is detected, the multi-annual measure continues to apply. A significant change would trigger a request for a full assessment and new catch advice.

For the North-East Atlantic Commission area, while multi-annual advice is provided, only initial discussions have been held on developing a risk framework for the Faroese fishery. Furthermore, ICES has indicated that none of the available indicator data sets would meet the criteria for inclusion in a FWI, so the only indication of a change in the status of stocks would be provided by a full assessment of the NEAC stock complexes. In the absence of a FWI, decisions concerning the Faroese fishery have continued to be adopted annually based on a full assessment of stock status, despite the availability of multi-annual catch advice (not quantitative). However, the Council has continued to ask ICES to investigate opportunities to develop a FWI or alternative methods that could be used to identify any significant change in previously provided multi-annual management advice.

In years when the FWI indicates no change in the stock status that would trigger a full assessment, ICES does not need to formulate catch advice for the West Greenland and North American Commissions. However, it does continue to develop information on stock status which is included in the WGNAS report but not the ACOM advice. Consultations suggest that the adoption of multi-annual regulatory measures for the West Greenland fishery has not greatly reduced the workload of the WGNAS but ICES has been able to provide very useful information on biological characteristics of salmon and analysis of historical tagging data, developed through Study Groups reporting to the WGNAS. These initiatives were supported by the IASRB.

Decision 5: The Council will continue and expand, as necessary, existing efforts to incorporate social and economic factors into its work.

In 2003 and 2004, NASCO held Technical Workshops on the social and economic aspects of the wild Atlantic salmon. 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; and guidelines for incorporating social and economic factors in decision under the Precautionary Approach, CNL(04)57. Under the Strategic Approach 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.

In order to make progress on the issues identified in the Strategic Approach, the Council established a Working Group which met in 2008 and which 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 Group had, therefore, started 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 work has continued by developing data on social and economic values associated with wild Atlantic salmon, a format for presentation of socio-economic information on the website and proposals for a Special Session on social and economic aspects to be held in 2012. This work is on-going. It has been noted by each of the FAR Review Groups that limited information has been presented in the FARs on how social and economic issues are included in management decisions and a well-planned Special Session may provide an excellent forum for a more in depth exchange of information on this

subject. The collation of social and economic information is also one element of the ‘State of the Salmon’ report envisaged under the Public Relations Strategy (see Decision 15 below).

Decision 6: The Council will include an item on its agenda entitled “New or emerging opportunities for, or threats to, salmon conservation and management” and request ICES and the NGOs to provide relevant information.

Since 2006, the Council’s agenda has included an item entitled ‘New or emerging opportunities for, or threats to, salmon conservation and management’ to provide an opportunity for any relevant information to be presented by the Parties, the NGOs and ICES (the requests to ICES since 2005 have also asked that relevant information be provided). A wide range of both threats (e.g. near shore and offshore energy developments, resistance of sea lice to treatments, and by-catch) and opportunities (e.g. restoration initiatives) have been noted. Where new or emerging threats or opportunities are identified, it will be important that NASCO and its Parties respond effectively.

Decision 7: Stakeholder input will be solicited on standing or *Ad hoc* working groups as appropriate.

The conditions governing NGO participation were greatly revised in 2006 and observer status now applies to all plenary sessions of the Council and the Commissions, whether at the Annual Meeting or at inter-sessional meetings, and the Council and Commissions may solicit NGO and other stakeholder input to meetings of working groups and other subsidiary bodies. The NGOs now participate in all NASCO meetings (other than the Finance and Administration Committee and Heads of Delegations meetings) including those of the Implementation Plan, FAR and ‘Next Steps’ Review Groups, the International Atlantic Salmon Research Board (IASRB) and its Scientific Advisory Group (SAG), the ISFA/NASCO Liaison Group (see Decision 8 below) and the Steering Committee for the 2011 Salmon Summit. NASCO has also sought broader stakeholder involvement in meetings of its working groups. For example, representatives of the International Baltic Sea Fishery Commission (IBSFC) participated in the NEAC *Gyrodactylus salaris* Working Group meetings and representatives of the North Pacific Anadromous Fish Commission (NPAFC), the European Inland Fisheries Advisory Commission (EIFAC) and the North Atlantic Marine Mammal Commission (NAMMCO) have attended NASCO’s Annual Meetings. There is, of course, a very broad range of stakeholder interests represented within NASCO’s 33 accredited NGOs.

Decision 8: The Council will continue to support broader stakeholder participation in the Liaison Group between NASCO and the North Atlantic salmon farming industry.

The issue of participation by its accredited NGOs in the meetings of the Liaison Group was raised on a number of occasions by NASCO representatives. A welcome development is that since 2007, the industry has agreed to such representation and conditions governing this participation have been developed, SLG(07)12. NGO representatives also participated in the work of the Liaison Group’s Task Force.

Decision 9: The Council will periodically conduct stakeholder dialogue meetings to improve outreach and education with regard to NASCO and its work and to seek information on ways to continue to improve the Organization's work.

A NASCO/ICES Dialogue meeting on salmon was held in Edinburgh in 1993. In 2005, as part of the 'Next Steps' review, the Council held stakeholder consultation (dialogue) meetings in London, UK and Portland, Maine, USA. These meetings were welcomed by stakeholders and provided valuable feedback on NASCO's work. The recommendations arising from these meetings (see CNL(05)15) were taken into account by the 'Next Steps' Working Group in developing its recommendations. One key issue identified by the stakeholders was research on salmon at sea. No subsequent dialogue meetings have been held and the Council may wish to consider if it wishes to hold further meetings in 2012 or 2013. The purpose of these meetings might be to report on developments since 2005, including the findings from the SALSEA Programme.

Decision 10: The Council will encourage accredited NGOs and, as appropriate, other stakeholders to continue to improve their cooperation with NASCO.

NASCO currently has 33 accredited NGOs that make a valuable contribution to its work. The Council has welcomed this involvement and has modified its protocols to provide greater opportunities for contributions from, and engagement with, its NGOs. The most recent amendment to these conditions was in 2006. In summary, under the revised conditions, the accredited NGO Chairperson and/or designee can make opening statements at the meetings of the Council and Commissions, the NGO Chairperson and/or designee can contribute to discussions on agenda items before and after the debate by the Parties (in practice the Council decided that such interventions could be made on all agenda items other than finance and administrative matters), and all NGOs can contribute to sessions designated as Special Sessions. The NGOs also participate in the work of the IASRB and its SAG, in all inter-sessional NASCO meetings including the Implementation Plan and Focus Area Report Review Groups, and the Steering Committee for the 2011 Salmon Summit. The NGOs have also played a central role in the Public Relations Group (until 2010 this was Chaired by the NGO Chairman), in developing NASCO's media strategy and in contributing funding to the SALSEA Programme. NASCO has welcomed the increased involvement of the NGOs in its work. The following statement by the NGO Chairman on the NASCO website perhaps highlights the cooperation that exists:

'The NGOs have worked successfully together with NASCO Parties to facilitate much greater transparency in its work, notably the requirement for each jurisdiction to produce an implementation plan which now creates public accountability for wild salmon management around the North Atlantic. Close co-operation and constructive criticism are essential to help implement both vital research and practical salmon management measures aimed at conserving and restoring this iconic species'.

Decision 11: Initial discussion of all agenda items will occur within the Council and Commissions. For agenda items that are discussed at Heads of Delegations meetings, the decision and rationale will be provided during discussion of those items at the full Council and Commission meetings.

This Decision was implemented in 2005 and has applied since. Most agenda items for either the Council or Commission meetings are no longer discussed in Heads of Delegations

meetings. When substantive discussions do occur, the nature of the discussions is summarized by the President in the plenary sessions before a final decision is taken. It is, however, to some extent a balance between being transparent and working as efficiently as possible.

Decision 12: The Council will review its relationships with other international organizations and explore areas of mutual interest.

This topic was reviewed by the Council in 2006, CNL(06)15. A review prepared by the Secretariat had noted that NASCO's broad remit means that there are many potential organizations with which it could, and should, cooperate subject to budgetary considerations. NASCO has established a good working relationship with ICES, which is subject to a Memorandum of Understanding. Improvements have been made to the timeliness and presentation of the scientific advice, through consultations with ICES. At the time of the 2006 review, cooperation was already underway with the RFBs in the Baltic Sea and North Pacific through, for example, joint meetings. In addition, it was suggested that NASCO should continue to participate in the meetings of the North Atlantic Regional Fishery Management Organizations (NARFMOs) and the FAO hosted Regional Fishery Bodies Secretariats Network (RSN) meetings and, where appropriate the annual meetings of other RFBs (e.g. NEAFC, NAFO) and meetings of the FAO Committee on Fisheries and the United Nations (UN) fisheries meetings. Furthermore, where specific issues arise, it was suggested that NASCO should seek cooperation from other relevant international organizations so as to share information on common problems, raise the profile of NASCO with these other international organizations, address problems of fisheries for other species affecting Atlantic salmon and share experience of working methods. The Council agreed to this approach and accordingly the Secretariat has continued to participate in the NARFMO and the RSN meetings. Following consultations between NASCO and NEAFC, additional information on pelagic fisheries was made available to ICES to assist in estimating the by-catch of salmon in these fisheries in the North-East Atlantic. It is hoped that the 'Salmon Summit' scheduled for October 2011 will involve participation from, and presentations by, scientists and managers from the North Pacific and Baltic areas. Informal consultations have also been held with the Oslo and Paris Commission (OSPAR) on issues of mutual interest. The European Inland Fisheries Advisory Commission (EIFAC) is represented at NASCO's Annual Meetings.

Decision 13: The Council will create a Public Relations Group.

One of the central themes of the Strategic Approach is the need for NASCO to better promote its work and achievements. The Council, therefore, established a Public Relations Group to develop a clear public relations strategy aimed at enhancing NASCO's profile and ensuring the most effective publicity for its work and achievements. This Group has met only once and its report was presented to the Council in 2007, CNL(07)16. However, the Council has struggled to some extent with identification of the messages, its target audience and resource availability. A Sub-Group has met during the Annual Meetings and worked by correspondence to further develop a media strategy and press releases.

Decision 14: The Council will seek input from NASCO's accredited NGOs to the development of the Organization's media strategy.

The NGOs, particularly those in North America, have much expertise and experience in public relations work and they have supported a partnership with NASCO through the Public Relations Group and its Sub-Group. Two representatives of the NGOs participated in the work of the Public Relations Group and until 2010, its Sub-Group was chaired by the Chairman of NASCO's NGOs. The Parties have had many discussions about the appropriate scope of a media strategy for the Organization but has made significant progress in redesigning the NASCO and IASRB websites.

Decision 15: NASCO will develop and implement a clear public relations strategy, including the establishment of a public relations group, aimed at enhancing its profile and ensuring the most effective publicity for its work and achievements.

In late 2005 and early 2006, a pilot study to raise NASCO's profile was conducted with the involvement of Porter Novelli, a public relations firm. The objectives of this study were to stimulate media interest in NASCO and its work. The experience from newspaper articles was that while they no doubt increased public awareness of NASCO's work, some were inaccurate (despite a large amount of factual information being made available to the journalists concerned) and could damage NASCO's reputation. Furthermore, the journalists tended to focus on particular aspects, where there might be conflict, such as impacts of aquaculture and not the bigger picture of the wide range of threats to the resource that NASCO is addressing. Porter Novelli had also made some recommendations for developing a longer term media strategy for NASCO and these were considered by the Public Relations Group (see Decision 13 above).

The main tasks identified by the Public Relations Group in developing a public relations strategy are: to identify key messages; to identify target audiences; to identify products and methods for delivering the message; to identify educational programmes with a view to initially establishing a database of such programmes on the basis of information provided by the Parties; and to establish a network of media contacts within the Parties and the NGOs and to contract, on a part-time, flexible basis, an information officer with good public relations skills.

There has been progress on several of these elements, through cooperation between the NGOs and Secretariat without employing an information officer. For example, the PR Group provided some examples of key messages and target audiences and a media fact sheet has been developed and is available on the NASCO website. The database of educational programmes has been established and links to these programmes' websites have been included on the NASCO website. The Public Relations Group believed that NASCO should develop an annual 'state of salmon populations' report and undertake a major enhancement of the Organization's websites. Both the NASCO and IASRB websites have been expanded and enhanced, and very favourable comments have been received. Monitoring indicates that both sites have attracted a good level of interest. It is intended that the rivers database will be available on the website by June 2011 so as to include an interactive element to the site. Progress towards developing the social and economic elements of the 'State of the Salmon' report is being made.

Decision 16: The Secretariat will engage professional expertise to produce media products and to develop a more relevant, attractive, informative and interactive website.

The Public Relations Group identified two main products that would be used for enhancing NASCO's profile and awareness of its work. These are the development of an annual 'State of the Salmon' report and a major enhancement of the Organization's websites. As indicated above, the websites have been enhanced and expanded and progress is being made on the social and economic elements of a 'State of the Salmon' report, but not the other elements.

Decision	Status	Comments
1: Review and adapt agreements	Implemented	Agreements adapted or developed during 2001 - 2004. During the FAR reviews; new guidelines developed in 2009 and 2010 to assist implementation
2: Ministerial Conference	Not implemented	Not held but steps taken to improve commitment and accountability (see Decision 20).
3: Homewater management measures	Implemented	Information provided in Implementation Plans, FARs (subject to review) and annual reports on Implementation Plans
4: Multi-annual regulatory measures	Partially implemented	Achieved since 2006 for WGC; lack of a risk assessment framework and FWI an issue in NEAC.
5: Social & economic factors	Partially implemented	Working Group established; international collation commenced with much new data collected. Special Session in 2012.
6: New or emerging threats & opportunities	Implemented	Included on Council agenda and request to ICES annually since 2006. ICES, NGOs and Parties provide information.
7: Stakeholder input to Working Groups	Implemented	NGOs involved in all Working Group meetings.
8: Participation in Liaison Group	Implemented	NGO participation in Liaison Group since 2007 and more recently in its Task Force.
9: Stakeholder dialogue meetings	Not implemented	None held since 2005 but greater NGO involvement in NASCO's work and websites greatly enhanced.
10: NGO cooperation	Implemented	NGO involvement in NASCO greatly enhanced including valuable support provided to SALSEA programme
11: Initial discussions in plenary	Implemented	Implemented in 2005; important that when discussions are held in Heads of Delegations a clear rationale is given
12: Relationship with other IGOs	Implemented	Reviewed in 2006 and effective. IGOs participate in NASCO's Annual Meeting and Working Groups
13: Public Relations Group	Partially implemented	Established and recommendations developed in 2007. Sub-Group continuing the work. Websites greatly enhanced.
14: NGO input to media strategy	Implemented	NGOs participated in the PR Group and in the ongoing work of its Sub-Group
15: Public relations strategy	Partially implemented	Key elements identified and media fact sheet developed but further development required; no information officer appointed
16: Media products & website	Partially implemented	Major website enhancement complete; rivers database being included (June 2011) and work on 'State of Salmon' report has commenced
17: Educational programmes	Implemented	Database created, links established through NASCO website
18: Additional reports on NASCO's work	Implemented	Twenty-year review published; guidelines developed and published in several languages (targeted at managers)
19: Task Force	Implemented	Recommendations of Task Force on commitment, transparency, and inclusivity adopted by Council in 2006
20: Implementation Plans	Partially implemented	Most but not all jurisdictions have developed Plans and FARs
21: Reporting on achievement of objectives at Special Sessions	Implemented	<i>Ad Hoc</i> Review Group reports presented annually at Special Sessions since 2007 for open discussion
22: Establish <i>Ad Hoc</i> Groups	Implemented	Groups established to review Implementation Plans and FARs. First cycle will be completed in 2011
23: NGO input on all agenda items	Implemented	Achieved since 2006 with NGO input on all agenda items other than Finance and Administrative matters

Table 1: Summary of progress on each decision in the Strategic Approach for NASCO's 'Next Steps'

The publication 'NASCO's Twenty-Year Milestones and Next Steps – A Vision for the Future', printed in 2005, has been extremely well received and is considered a very useful summary of NASCO's work and future challenges (see decision 18 below). It has been widely circulated and is available on the NASCO website. Similarly, the guidelines referred to in Decision 1 have been printed in brochure format and widely distributed and made available on the NASCO website.

Decision 17: NASCO will develop links with educational programmes and establish the means to achieve mutual benefits from such alignment.

The Public Relations Group recognised that while educational programmes have an important role in communicating with the public, NASCO does not have the resources to develop and deliver educational programmes. It noted, however, that there are some excellent educational programmes for Atlantic salmon around the North Atlantic and that there might be benefits from enhanced cooperation and information exchange among these programmes. NASCO might also wish to consider providing information, for example in relation to the SALSEA programme that could be incorporated into such programmes. The Council decided that, as a first step, the Parties, their relevant jurisdictions and the accredited NGOs be requested to provide information to the Secretariat on these educational programmes so that a database of information can be developed and made available on the NASCO website and links to these programmes established. This has been done (see <http://www.nasco.int/links.html>).

Decision 18: The Council will consider the need for additional reports to improve the public understanding of information relevant to NASCO's activities.

As reported under Decision 16, the publication 'NASCO's Twenty-Year Milestones and Next Steps – A Vision for the Future' is considered to provide a useful summary of NASCO's work. It may be worth updating this document following the review of the 'Next Steps' process. Both the NASCO and IASRB websites provide background information on the life-cycle of the salmon, the issues facing the resource and the management actions being taken both internationally through NASCO and by individual jurisdictions. Following the FAR reviews, the guidelines referred to in Decision 1 above were adopted by the Council. These guidelines aim to assist the jurisdictions in making further progress in implementing NASCO's agreements and guidelines; to provide for an exchange of information; to assist in the preparation of future FARs and their review; and to assist in the identification of what additional actions may be required. The guidelines are available on the NASCO website. They are not intended for the public but have been widely distributed including to managers, presumably increasing awareness of NASCO's work. The fisheries management and habitat guidelines have been published by the Secretariat in booklet format in English and French and widely distributed. The intention was to do the same for the salmon farming BMP Guidance but the Liaison Group decided that the need to publish this Guidance should be revisited once the aquaculture and related activities FAR review process was completed. The fisheries management guidelines have also been translated into Russian.

Decision 19: The Council will create a Task Force representing the Heads of Delegations in order to further consider Council Decisions regarding implementation, commitment and accountability.

This Council did create a Task Force which met in 2006 and reported the same year to the Council. In the light of the Task Force's recommendations the Council adopted Guidelines

for the Preparation of Implementation Plans and for Reporting on Progress, NSTF(06)10, decided on the structure and functioning of the *Ad hoc* Review Groups that would review both the Implementation Plans and FARs (although the process and timing used by the Review Groups has evolved from those originally envisaged by the Task Force), and agreed on new conditions to increase NGO participation in NASCO's meetings.

Decision 20: Each Party or relevant jurisdiction should develop an implementation plan for meeting the objectives of NASCO's agreements. Each Party or relevant jurisdiction should then report on steps taken pursuant to the Plan. These approaches should be evaluated after a trial period.

One clear message from the 'Next Steps' process was that the reporting arrangements existing at that time were not transparent, did not facilitate information exchange on best practice and did not facilitate challenging and critical review. New arrangements were, therefore, put in place. Implementation Plans, FARs and Annual Reports have been developed by most, but not all, jurisdictions, although not all of the Plans and FARs were submitted in time to be reviewed. The *Ad Hoc* Review Groups have highlighted where additional actions would be required to improve consistency with NASCO's agreements.

In addition, there are annual reports on all aspects of the Implementation Plans (since 2009 using a new format designed to ensure that the reporting burden could be minimized but well focused) so as to allow progress to be tracked. Under its TORs the 'Next Steps' Review Group has been asked to review the process used for reporting and evaluation of these reports and advise on any changes for the next reporting cycle. A separate report on this aspect has been prepared, NS(11)3.

Decision 21: Reporting to the Council on progress in achieving the objectives should be conducted in a Special Session so as to allow direct NGO involvement, greater opportunity for discussion, and critical review of the reports made by the Parties in implementation of agreements.

Special Sessions have been held annually since 2006 to allow for presentation of the Implementation Plans and FARs and the findings of the *Ad Hoc* Review Groups. The first round of this process will be completed in June 2011, with the presentation of the final report of the aquaculture and related activities FAR Review Group. A separate document on reporting and evaluation of reports has been prepared, NS(11)3.

Decision 22: The Council should establish an *Ad hoc* group to support the President in determining the conclusions of the Special Sessions at which progress reports on Implementation Plans have been presented and reviewed.

As indicated under Decision 20, *Ad Hoc* Review Groups have reviewed both the Implementation Plans and the FARs and the findings from these reviews have been presented at Special Sessions during the Annual Meetings. In practice, the Review Groups reviewed the FARs and presented their draft findings in one year but then submitted their final report, the following year. This allowed for thorough consideration of any feedback received during the Special Session and direct from the Parties.

Decision 23: The Council should seek ways to increase NGO involvement in its meetings by amending current NGO observer rules to provide discretion to the NASCO President and Commission Chairmen to recognise requests for the floor by observers on any agenda item under discussion before and after debate by the Parties on that item.

This has been achieved. See report under Decision 10 above.

3. Progress to Date on the Challenges in the Strategic Approach

Progress to date on each of the key issues for the challenges identified in the Strategic Approach is described in the paragraphs below and is summarized in Table 2 on pages 20 - 21 of this document. Where progress has already been described in relation to the Decisions (section 2 above), it is not described again here.

Challenge 1: Management of salmon fisheries

The goals for the management of salmon fisheries for NASCO and its Parties are to promote the diversity and abundance of salmon stocks and to maintain all stocks above their conservation limits.

Key issue 1: Maintain an effective prohibition on fishing for salmon beyond areas of fisheries jurisdiction

The NASCO Convention created an enormous ‘protected zone’ free of salmon fishing, in most areas of the North Atlantic beyond 12 nautical miles from the baselines. In the late 1980s and early 1990s, the Council acted quickly to address fishing for salmon in international waters in the North-East Atlantic by vessels registered to Panama and Poland. A combination of diplomatic action and cooperation to prevent landings appears to have addressed the problem. Measures were also taken to improve exchange of surveillance information and there have been no sightings since the early 1990s, although airborne surveillance is limited during the winter months.

Key issue 2: Further improve the ‘fairness’ and balance in management of distant-water fisheries

See progress report under Decision 3 above.

Key issue 3: Explore possibilities for longer-term regulatory measures

See progress report under Decision 4 above.

Key issue 4: Exchange information and transfer expertise and knowledge between Parties and between NGOs and the authorities

The ‘Next Steps’ process resulted in the introduction of comprehensive new reporting procedures intended to facilitate a transparent and meaningful exchange of information and greater NGO involvement. An enormous amount of information on how each jurisdiction manages its salmon fisheries is now available in the Implementation Plans and FARs, and an overview of this material has been produced. These plans and reports have been evaluated by Review Groups and have been made available on the NASCO website together with the

results of the evaluations. To assist jurisdictions make further progress in implementing NASCO's agreements and to provide a basis for exchange of information on more consistent approaches to managing fisheries, Guidelines for the Management of Salmon Fisheries were adopted in 2009. The NGOs participated in the Review Groups and can now contribute on all Council and Commission agenda items including those concerning establishment of regulatory measures.

Key issue 5: Further develop the knowledge basis for fisheries regulations

See comments in previous paragraph concerning reporting procedures and adoption of Guidelines for the Management of Salmon Fisheries. While progress has been made, not all jurisdictions have, as yet, established conservation limits and, where they have been established, it is clear from the ICES advice that many stocks are currently below these limits.

Challenge 2: Social and economic aspects of the Atlantic salmon

The goal for NASCO and its Parties on the social and economic aspects of the Atlantic salmon is to ensure that the salmon stocks provide the greatest possible benefits to society and individuals.

Key issue 1: Ensure that appropriate emphasis is given to the social and economic aspects of the Atlantic salmon

See Decision 5 above.

Key issue 2: Strengthen the socio-economic data as a basis for managing Atlantic salmon

See Decision 5 above.

Key issue 3: Integrate social and economic aspects and considerations in an open and transparent way into the decision-making processes within NASCO

See Decision 5 above. Through the Council's initiatives referred to in Decision 5 above, 'Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach' were adopted in 2004 and the first international collation of social and economic information relating to Atlantic salmon is being developed. There has, however, been little exchange of information on how the Guidelines are used by the jurisdictions. Furthermore, each of the FAR Review Groups has highlighted the fact that limited information was provided on how social and economic factors are taken into account in management decisions. One of the aims of a Special Session on social and economic issues to be held in 2012 is to allow for an exchange among the Parties on their experiences of using the Guidelines, with a view to considering if further work is required on this aspect of NASCO's work.

Key issue 4: Disseminate information on the social and economic aspects of the wild Atlantic salmon in order to ensure that they are given due weight compared to other important commercial and public interests

See Decision 5 above. A Sub-Group is developing information for inclusion on the NASCO website and for inclusion in a 'State of the Salmon' report.

Challenge 3: Research on salmon at sea (including studies of by-catch of salmon)

The goal for NASCO and its Parties is to promote collaboration and cooperation on research into the causes of marine mortality of Atlantic salmon and the opportunities to counteract this mortality.

Key issue 1: Develop an effective fund-raising strategy and identify and target potential sponsors

The SALSEA Programme is a very major, innovative public/private research initiative that from modest 'pump-priming' funds from NASCO has resulted in more than £5 million being committed to research on salmon at sea. An effective fund-raising effort has allowed what is believed to be the single largest international research effort related to Atlantic salmon ever to be implemented. Future research needs and the management implications arising from the SALSEA Programme will be considered at the 'Salmon Summit' in 2011. The need for any future fund-raising initiatives will depend on the research needs identified.

Key issue 2: Strengthen NGO involvement in, and support for, the Board and for its fund-raising activities

The NGOs have played a central role both in developing and implementing the SALSEA Programme, including providing valuable assistance in identifying funding e.g. from the TOTAL Foundation, and in funding the research e.g. AST funding for the SALSEA-Merge scientific coordinator and ASF funding for acoustic tagging studies in North America. With regard to by-catch of salmon, NASCO annually requests information from ICES. New information obtained under the SALSEA Programme on the distribution and migration of salmon at sea may assist in identifying overlap of post-smolts with pelagic fisheries and this topic will be covered at the 'Salmon Summit'.

Challenge 4: Protection and restoration of Atlantic salmon habitat

The goal for NASCO and its Parties is to maintain and, where possible, increase the current productive capacity of Atlantic salmon habitat.

Key issue 1: Ensure effective implementation of NASCO's Plan of Action

While it is clear that progress has been made in implementing the Plan of Action, the habitat *Ad Hoc* Review Group concluded that in the case of nine of the thirteen FARs, the approach outlined was not consistent with the NASCO Plan of Action. Thus, while there have been some notable improvements, major challenges remain not least those related to climate change. The development of Guidelines for the Protection, Restoration and Enhancement of

Salmon Habitat should assist jurisdictions in making further progress in implementing NASCO's agreements.

Key issue 2: Enhance sharing and exchange of information on habitat issues and best management practices between NASCO Parties and other relevant international bodies

The 'Next Steps' process resulted in the introduction of comprehensive new reporting procedures intended to facilitate a transparent and meaningful exchange of information. An enormous amount of information on how each jurisdiction manages its salmon habitat is now available in the Implementation Plans and FARs, and an overview of this material has been produced for each focus area. These plans and reports have been evaluated by Review Groups and have been made available on the NASCO website together with the results of the evaluations. To assist jurisdictions make further progress in implementing NASCO's agreements and to provide a basis for exchange of information on the management of salmon habitat, Guidelines for the Protection, Restoration and Enhancement of Salmon Habitat were adopted in 2010.

With regard to information exchange with other international bodies, see the summary of progress under Decision 12 above.

Key issue 3: Maintain the NASCO salmon rivers database

The information held in the rivers database, has been sent to the jurisdictions with a request that it be validated with the intention of making the information available on the NASCO website before the 2011 Annual Meeting. The database is seen as an important component of NASCO's Public Relations Strategy.

Challenge 4: Aquaculture, introductions and transfers and transgenics

The goal for NASCO and its Parties is to minimise the possible adverse impacts of aquaculture, introductions and transfers and transgenics on the wild stocks of Atlantic salmon, including working with industry stakeholders, where appropriate.

Key issue 1: Determine the need for internationally agreed regulations or standards for aquaculture and related activities

The NASCO/ISFA Liaison Group established a Task Force with the aim of: identifying a series of best practice guidelines and standards to address the impacts of aquaculture on wild salmon stocks; to identify knowledge gaps and research requirements to address them; and to consider if, and how, impact targets can be identified. This work resulted in NASCO and ISFA adopting BMP Guidance, framed around the elements of the Williamsburg Resolution. The basic principle is that wild salmon stocks in areas with salmon farms should be as healthy as those in areas without farms and progress towards the international goals in this BMP Guidance is being reviewed through the FARs. The guidance includes international goals relating to escapees and sea lice and elements on reporting and tracking and factors facilitating implementation. The guidance provides a range of measures from which those most appropriate to the local conditions should be put into place to safeguard the wild salmon stocks. With regard to the parasite *G.salaris*, a 'Road Map' has been developed (see Challenge 5 below).

Key issue 2: Enhance public awareness of developments concerning aquaculture and related activities

Information relating to NASCO's work in relation to aquaculture, introductions and transfers and transgenics is available on the NASCO website, including details of the work of the Liaison Group and copies of Implementation Plans and FARs. The broader aspects of NASCO's Public Relations initiatives are described in Decisions 15 and 16 above.

Key issue 3: Minimise the escape of farmed salmon to a level that is as close as practicable to zero

Key issue 5: Minimise the adverse genetic and other biological interactions from salmon enhancement activities

Key issue 6: Minimise the risk of transmission to wild salmon stocks of diseases and parasites

The review of the aquaculture, introductions and transfers FARs has highlighted that while progress has been made there is a need for additional actions to ensure consistency with NASCO's agreements.

Key issue 4: Minimise any negative impacts of ranched salmon

No salmon ranching, as defined in the Williamsburg Resolution, is currently undertaken in the North Atlantic other than on an experimental scale, and in these cases the NASCO guidance appears to be applied.

Key issue 7: Consider the consequences of aquaculture of Atlantic salmon in countries that are not parties to NASCO

This aspect has been discussed at the meetings of the Liaison Group and, while it is recognised as an issue, there is probably little that the Liaison Group can do to ensure a 'level playing field' for the industry internationally.

Challenge 5: *Gyrodactylus salaris*

The goal for NASCO and its Parties is to prevent the further spread of this parasite and to eradicate it from infected areas, working with stakeholders, where appropriate.

Key issue 1: Minimise the threat posed by G.salaris to Atlantic salmon

In order to provide a forum for exchange of information on monitoring programmes for the parasite, its distribution, measures to prevent its spread and approaches to its eradication, the North-East Atlantic Commission established a Working Group that met in 2004, 2006 and 2008. In 2004, a 'Road Map' was adopted by the Commission that contained recommendations on enhancing cooperation on monitoring, research and exchange of information and for strengthened national and regional legislation and measures to prevent the further spread of the parasite. The recommendations in the 'Road Map' when implemented should minimise the risk of further spread of the parasite and assist in its containment and eradication. However, the Working Group has not met since 2008 so progress on the elements in the 'Road Map' has not been reported although relevant information relating to the parasite has been included in several FARs. While the North-East Atlantic Commission invites reporting in relation to the parasite, limited information on the

elements in the 'Road Map' has been provided. The Commission might, therefore, wish to consider if additional procedures are required to allow more comprehensive reporting on, and review of, progress in relation to the elements in the 'Road Map' e.g. a biennial meeting of the Working Group.

Key issue 2: Enhance cooperation on monitoring, research and dissemination of information regarding G.salaris

See progress report under key issue 1 above.

Key issue 3: Strengthen international, national and regional legislation and guidelines to prevent the further spread of G.salaris

One of the key issues identified by the Working Group, was the importance of maintaining the Additional Guarantees that allow jurisdictions to take additional protective measures in relation to *G.salaris* under the EU Fish Health Directive. At the Commission's 2010 Annual Meeting the EU referred to the adoption of decision 2010/221 EU, the effect of which was that the previous measures in Article 4.3 of Directive 2006/88 relating to *G.salaris* would continue to apply. This would mean that certain jurisdictions (Ireland, UK, and specified river catchments in Finland) would be able to continue to take protective measures against the parasite.

Challenge 6: Initiatives for endangered salmon populations

The goal for NASCO and its Parties is to cooperate internationally to protect and rebuild threatened and endangered salmon populations in order to preserve natural diversity.

Key issue 1: Develop a common terminology to describe the level of threat

The NASCO Rivers Database categorizes rivers as threatened with loss, not threatened with loss, lost etc. but these categories do not differentiate to the level identified in the Strategic Approach (e.g. vulnerable, near threatened, endangered, etc.).

Key issue 2: Choose the appropriate strategy, management actions and conservation approaches

While information has been presented by some jurisdictions in their Implementation Plans and FARs relating to specific initiatives for endangered salmon populations and, in 2004, Guidelines on the Use of Stock rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks were adopted by the Council, there has been no specific focus on this issue by the Council in the light of the 'Next Steps' review.

Key issue 3: Facilitate a regular exchange of know-how in this field

Information has been provided in the FARs, for example in relation to Atlantic salmon populations listed under the US Endangered Species Act, the Canadian Species at Risk Act, and other designations, but there have been no discussions focusing solely on endangered populations.

Key issue 4: Identify efficient stock monitoring techniques to measure success

No specific actions have been taken although the Guidelines on the Use of Stock Rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks include elements on monitoring.

4. Further actions

In the Tables 1 and 2, we have tried to assess, subjectively, the progress made in relation to each decision and key issue in the Strategic Approach. In these tables, a traffic light system has been used to indicate those decisions and key issues which appear to us to have been implemented (green), those where implementation is partial (amber) and those where no progress has been made to date (red). This is only the view of the Secretariat and is presented only to aid discussion.

Decisions

There are only two decisions which have not been implemented; arranging a Ministerial Conference and holding follow-up stakeholder meetings. With regard to the Ministerial Conference, the Task Force recognized that this might only be required if a specific need arose and in this case it would be important to have clear objectives. The original intention had been to hold such a meeting to improve commitment to NASCO's agreements and it will be for the Review Group to assess if the arrangements that have been put in place to achieve this are considered to be adequate or whether it feels that a Ministerial Conference on this issue might offer benefits.

With regard to stakeholder consultation meetings, no such meetings have been held since 2005 but the greater involvement of accredited NGOs in NASCO today may mean that further stakeholder consultation meetings are less necessary assuming that our NGOs report back to their membership on the Organization's activities. Furthermore, the major enhancement of both the NASCO and IASRB websites means that much more information on the Organization's work is now readily available to all stakeholders. As noted earlier, monitoring suggests that these websites are receiving greatly increased traffic.

With regard to those decisions that are considered to have been partially implemented, there has been progress in relation to establishing multi-annual measures, developing social and economic information, in developing Implementation Plans and in developing a Public Relations Strategy. This work is still ongoing and on some issues there are significant challenges (e.g. in setting multi-annual measures for the Faroese salmon fishery in the absence of a Risk Framework and a Framework of Indicators).

Key issues

Similarly, in relation to the key issues on each challenge, real progress has been made in addressing those concerning management of salmon fisheries and research on salmon at sea. Work is also underway in relation to: the social and economic aspects of Atlantic salmon; habitat protection and restoration; and aquaculture, introductions and transfers and transgenics (including *G.salaris*). However, there has been little specific consideration of initiatives for endangered salmon populations. It is fair to say that there is now a process in place to better assess progress on the key issues on each challenge for NASCO as identified

in the Strategic Approach. While it is clear from the first round of reporting that progress has been made, there are also still major challenges to be addressed. The Review Group's assessments indicate that only 1 jurisdiction had implemented measures consistent with NASCO's agreements relating to management of fisheries, 4 in relation to habitat protection and restoration and 2 in relation to aquaculture and related activities. It will be important that momentum is maintained on all of these issues and the Review Group's have also suggested that there should be greater focus on the effectiveness of the measures so that the adequacy of NASCO's agreements can be assessed.

5. Conclusions

The 'Next Steps' review process has resulted in major changes to the nature of NASCO's work and to the way it conducts its work in a more transparent and inclusive manner. It is gratifying that the majority of the decisions arising from this process have either been implemented or significant progress has been made. In particular, there is now far more transparency and greater accountability of the measures taken by jurisdictions in accordance with NASCO's agreements and much greater NGO involvement in NASCO's work. Progress is also being made in raising NASCO's profile. The first phase of implementation has focused on describing the actions being taken by each jurisdiction to comply with NASCO's agreements. Future reports could focus more on the effectiveness of these measures.

The Review Group may wish to consider the assessments made in this review and decide if it wishes to make recommendations to the Council for further action on the elements in the Strategic Approach or consider if any new actions might be considered to ensure that NASCO can meet its objectives of conserving, restoring, enhancing and rationally managing Atlantic salmon in the face of the many challenges to the resource. It could be argued that, in the light of present stock status, despite the progress made, the need for international cooperation on salmon matters has never been greater.

Secretary
Edinburgh
2 February 2011

Table 2: Summary of progress on each of the key issues in the Strategic Approach for NASCO's 'Next Steps'

Key issue	Status	Comments
Challenge 1: Management of salmon fisheries		
1: Maintain an effective prohibition on fishing for salmon beyond areas of fisheries jurisdiction	Implemented	No sightings of fishing in international waters since early 1990s. Measures taken to improve exchange of airborne surveillance information
2: Further improve the 'fairness' and balance in management of distant-water fisheries.	Implemented	See decision 3 above
3: Explore possibilities for longer-term regulatory measures.	Partially implemented	See decision 4 above
4: Exchange information and transfer expertise and knowledge between Parties and between NGOs and the authorities.	Implemented	'Next Steps' process resulted in the introduction of comprehensive new reporting procedures; Implementation Plans and FARs available on the website. New Guidelines should facilitate a transparent and meaningful exchange of information in future
5: Further develop the knowledge basis for fisheries regulations.	Implemented	'Next Steps' process resulted in the introduction of comprehensive new reporting procedures; Implementation Plans and FARs available on the website. New Guidelines should facilitate a transparent and meaningful exchange of information in future
Challenge 2: Social and economic aspects of the Atlantic salmon		
1: Ensure that appropriate emphasis is given to the social and economic aspects of the Atlantic salmon.	Partially implemented	See Decision 5 above
2: Strengthen the socio-economic data as a basis for managing Atlantic salmon.	Partially implemented	See Decision 5 above
3: Integrate social and economic aspects into the decision-making processes within NASCO.	Partially implemented	See Decision 5 above. Special Session in 2012 to explore <i>inter alia</i> if improvements could be made to the Guidelines
4: Disseminate information on the social and economic aspects of the wild Atlantic	Partially implemented	See Decision 5 above. A Sub-Group is developing information for inclusion on the NASCO website and for inclusion in a 'State of the Salmon' report.
Challenge 3: Research on salmon at sea (including studies of by-catch of salmon)		
1: Develop an effective fund-raising strategy and identify and target potential sponsors.	Implemented	SALSEA Programme adopted and implemented through major public/private partnership
2: Strengthen NGO involvement in, and support for, the Board and for its fund-raising activities.	Implemented	NGOs are major contributors to SALSEA through provision of funding to the Board, assisting in identifying sponsors and in conducting their own research projects.
Challenge 4: Protection and restoration of Atlantic salmon habitat		
1: Ensure effective implementation of NASCO's Plan of Action for Habitat Protection and Restoration	Partially implemented	Considerable progress made but for most jurisdictions the approach outlined in the FARs was not yet consistent with the NASCO Plan of Action.

2: Enhance sharing and exchange of information on habitat issues and best management practices.	Implemented	Through Implementation Plans and FARs (see Decision 12 regarding cooperation with other international organizations).
3: Maintain the NASCO salmon rivers database.	Partially implemented	Updating of information underway with a view to the database being made available on the website in 2011.
Challenge 5: Aquaculture, introductions and transfers and transgenics		
1: Determine the need for internationally agreed regulations or standards	Implemented	BMP Guidance developed following review of international agreements etc. 'Road Map' for <i>G.salaris</i> developed and Additional Guarantees under EU Fish Health Directive in place.
2: Enhance public awareness of developments concerning aquaculture, introductions and transfers and transgenics.	Partially implemented	NASCO website includes details of the work of the Liaison Group and the Implementation Plans and FARs. NASCO's broader PR initiatives are described in Decisions 15 and 16.
3: Minimise the escape of farmed salmon to a level that is as close as practicable to zero.	Partially implemented	FARs review has highlighted that while progress has been made further progress is needed to ensure consistency with NASCO's agreements.
4: Minimise any negative impacts of ranched salmon	Implemented	Currently no ranching other than experimental which appears consistent with guidance.
5: Minimise the adverse genetic and other biological interactions from salmon enhancement activities	Partially implemented	FARs review has highlighted that while progress has been made further progress is needed to ensure consistency with NASCO's agreements.
6: Minimise the risk of transmission to wild salmon stocks of diseases and parasites	Partially implemented	FARs review has highlighted that while progress has been made further progress is needed to ensure consistency with NASCO's agreements.
7: Consider the consequences of aquaculture of Atlantic salmon in countries that are not parties to NASCO.	Implemented	Considered by the Liaison Group but little scope for action.
Challenge 6: <i>Gyrodactylus salaris</i>		
1: Minimise the threat posed by <i>G.salaris</i> to Atlantic salmon.	Partially implemented	The recommendations in the 'Road Map', when implemented, should minimise the risk of further spread of the parasite and assist in its containment and eradication if introduced.
2: Enhance cooperation on monitoring, research and dissemination of information.	Partially implemented	'Road Map' contains recommendations on improvements to monitoring, research needs etc.
3: Strengthen international, national and regional legislation and guidelines to prevent the further spread of <i>G.salaris</i> .	Partially implemented	Additional Guarantees available under EU Fish Health Directive.
Challenge 7: Initiatives for endangered salmon populations		
1: Develop a common terminology to describe the level of threat	Not implemented	The NASCO Rivers Database categories do not differentiate to the level identified in the Strategic Approach
2: Choose the appropriate strategy, management actions and conservation approaches.	Not implemented	Not considered by NASCO although information has been provided for a number of jurisdictions in their Implementation Plans and FARs
3: Facilitate a regular exchange of know-how.	Partially implemented	Information has been provided for a number of jurisdictions in their Implementation Plans and FARs
4: Identify efficient stock monitoring techniques.	Partially implemented	Guidelines on the Use of Stock rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks and other guidelines include elements on monitoring

NS(11)3

Review of the process used for reporting and evaluation of the reports

1. Introduction

The ‘Guidelines for the Preparation of NASCO Implementation Plans and for Reporting on Progress’, NSTF(06)10, developed as part of the Next Steps process envisage two forms of reports – Annual Reports and Focus Area (Special Session) Reports (FARs). The primary purpose of the Annual Reports is to provide a summary of all the actions that have been taken under the Implementation Plan in the previous year. In addition, any significant changes to the status of stocks, factors affecting stocks and the management regime in place should be included in these reports. The FARs provide a more in-depth assessment of actions taken under one of the Focus Areas and provide the basis for review of management actions taken within each jurisdiction over more than one year to meet the objectives of the Implementation Plan and their efficacy in addressing the overall objectives of NASCO.

Under its Terms of Reference, the Review Group has been asked to review the process used for reporting and evaluation of these reports and advise on any changes for the next reporting cycle. This document draws on comments made by the Review Groups and at the Special Sessions in relation to reporting and evaluation.

2. Reporting to date

Background

The intention was that all jurisdictions would submit an Implementation Plan that would be reviewed by an *Ad Hoc* Review Group and amended in the light of any comments received. This process was completed in 2007. It is important to note that these Implementation Plans were reviewed only for their consistency with the ‘Guidelines for the Preparation of NASCO Implementation Plans and for Reporting on Progress’, not on the adequacy of the measures they contain. FARs were then requested on fisheries management (2008), habitat protection and restoration (2009) and aquaculture and related activities (2010) and these were assessed for consistency of the actions taken with NASCO’s agreements. Again, the effectiveness of the actions was not the focus of the evaluation. In 2009, a reporting format for the annual returns was agreed and this was used in reporting to the Council in 2009 and 2010.

Contributions from all jurisdictions

Most, but not all, jurisdictions have submitted Implementation Plans, FARs and Annual returns (see document NS(11)2). The Review Groups have expressed concern that the lack of these documents for some jurisdictions jeopardises the process that was intended to improve commitment to NASCO’s agreements. It could be argued that a minimum requirement of belonging to an international organization would be to

follow its agreed decisions and it will be important, if there is another cycle of reporting, that all jurisdictions provide all the documents requested.

Following the requested format

Each of the Review Groups has noted that some FARs did not follow the agreed format developed to assist with the preparation of FARs and Implementation Plans. This makes the review process more difficult and time consuming. The formats used for reporting were developed by the Council not by the Review Groups. It was noted by some jurisdictions that these formats led to some duplication of effort (perhaps particularly so for the aquaculture FARs) while other jurisdictions indicated that the format constrained the information that could be presented. In this regard, the development of guidelines by the Review Groups is intended to assist in the development and evaluation of FARs in future. If there is another cycle of reporting, Terms of Reference will need to be agreed that indicate whether reporting is to be against the agreements, guidelines or some combination of the two.

Timeliness

The Council had established deadlines for submitting Implementation Plans and FARs. The Review Group reports indicate that many FARs were received late, at the meeting or even after the meeting. The Review Groups had an enormous amount of information to digest and assess and all the Groups went to great lengths to ensure they were fair in their assessments. However, late submission of FARs reduced the amount of time for preparatory work prior to the meetings and this was perhaps a particular problem for the NGO members of the Group who needed to consult their colleagues.

Volume of information

While the Council did not develop guidance on the length of Implementation Plans and FARs, some of these documents contained an enormous amount of information e.g. some FARs were over 200 pages long. The Habitat Review Group had proposed to the Council that for future reports a maximum length of 20 pages should be set with additional information contained in annexes. However, for the aquaculture review this led to some FARs containing huge amounts of information in annexes without any summary in the body of the report. Other FARs provided links to websites but the Review Groups simply don't have the time either to digest such large volumes of information or to access material on the web. It is important, therefore, that for future reporting the measures in place are succinctly summarised in the report with more detailed information annexed to the report should the Groups feel they need to check the details. Conversely, one or two of the FARs were so short that it was impossible to obtain a clear picture of the management approach in place.

Content

Each of the FAR Review Groups has highlighted issues in their reports that were generally poorly covered in the reporting. These issues include evaluation of the effectiveness of management measures, social and economic factors, placement of the burden of proof and implementation of corrective measures. As these issues are all important aspects of a Precautionary Approach, it will be important that they are addressed in the next reporting cycle. It is clear that those jurisdictions using English as their first language had an advantage in preparing a FAR. It has to be remembered that the FAR reviews are conducted by a small group studying a large volume of information. The Review Groups did not visit the jurisdictions and had to rely entirely on the words on the paper. Some writers of FARs may have been more skilled than others in English and better at presenting their case than others. However, it was also noted by some Review Groups that some FARs were written in a less defensive, more transparent and open way than others.

The habitat Review Group considered that it might be useful for the Council to facilitate a more detailed exchange on a specific topic so as to further enhance the collaborative learning process under the 'Next Steps' process e.g. on fish passage or liming of acidified waters.

Focus on outcomes

The Implementation Plan Review Group noted that some Plans lacked specific management actions with timescales for their implementation. In this regard, the Group noted that an action specifies what will be done in a given period of time rather than identifying general goals. This Group believed that this failing would compromise the next stage of reporting under the FARs and Annual Reports. Similarly, a criticism raised by the aquaculture, introductions and transfers and transgenics Review Group was that while some FARs contained considerable information to describe the activities, policy and management structures in place, they failed to focus on the outcomes of measures taken and on demonstrating progress towards achieving the international goals to safeguard the wild stocks.

3. Evaluation of reports

Objectivity

The Council had agreed, and it was stressed strongly to the members of the Review Groups, that they were there to represent NASCO and not their own jurisdictions. There was no instance where it seemed that a reviewer was ignoring this request. To formalise this, each representative of a jurisdiction left the room when his/her jurisdiction's Implementation Plan or FAR was being reviewed.

Fairness and balance

The Review Groups went to great lengths to be fair and their efforts to produce a balanced report were impressive. Initial reviews were undertaken by a representative

of the jurisdictions and by the NGOs. These initial reviews formed the basis of discussions in the Groups and an agreed review was then developed. In all cases, the reviews were unanimously agreed; although in the case of the aquaculture Group several general statements were made by the NGOs that did not find unanimous support from the rest of the Review Group. These statements were annexed to the Group's final report. All the assessments were reviewed again at the end of the process to ensure consistency. The Implementation Plan Review Group also recognised that it would not be reasonable to expect management actions to be implemented to address every threat to the resource within a five year period and that the extent to which management actions specified in the plan could be implemented within the period of the plan would depend on the availability of adequate resources at the time of their implementation. So the Groups' were realistic in their expectations of what could be achieved and sought to assess progress towards implementation of NASCO's agreements.

The Review Groups were also aware that in some jurisdictions the management responsibility lies to some extent with riparian owners while in others the management of the resource and its habitat are the responsibility of the public sector. Furthermore, the extent of the salmon stocks and the resources available to manage them vary markedly among jurisdictions. The Review Groups did not penalise or compensate for these differences.

Each of the Review Groups conducted their reviews solely on the basis of information provided in the reports even when some members of the Group may have been aware of other measures that might have been included in the FARs.

Special Session Presentations

Each Review Group presented both its draft and final reports in Special Sessions during the Annual Meetings. These sessions were certainly a breakthrough in transparency and inclusivity, but feedback suggests that they were not always as stimulating and challenging as might have been expected. Perhaps this is inevitable given the nature of the report under consideration. In future, if there is a further round of reporting the reviews might be better discussed in plenary with consideration being given to Special Sessions focusing on a specific issue on which an exchange of information could be beneficial e.g. fish passage, management of mixed stock fisheries, incorporation of socio-economic factors in management decisions (planned for 2012) etc. Some Review Groups noted that there was a lack of reporting on issues in one jurisdiction that might be adversely affecting salmon stocks in another and these issues were, perhaps surprisingly, not raised in the Special Sessions either.

Composition of the Review Groups

The Council had agreed that each Review Group should comprise two NGO representatives, a member of the Standing Scientific Committee and three representatives of the Parties (including one from Denmark (in respect of the Faroe Islands and Greenland). Representatives of Denmark (in respect of the Faroe Islands and Greenland) were invited to participate in all the Groups in order to allow them to

assess fairness and balance between the measures taken for the distant water fisheries and those being taken by States of Origin. Certainly, the representative of Denmark (in respect of the Faroe Islands and Greenland) made a significant contribution to the fisheries management Review Group but this delegation was unable to participate in the other two Review Groups. This involvement will need to be considered in preparing for the next cycle.

With regard to the aquaculture review, ISFA has indicated that it wished to be represented on the Group. No representatives of industry attended the other reviews relating to management of fisheries and habitat. ISFA did, however, have the opportunity to comment on the TORs for the Review Group and the Group's reports were presented first at the Liaison Group, before consideration by the Council, so as to allow for feedback from the industry. It should be noted that the review is an internal review by NASCO of its progress in implementing its own agreements.

4. Future Reporting

It was envisaged under the 'Guidelines for the Preparation of NASCO Implementation Plans and for Reporting on Progress' that the Implementation Plans would apply for a period of at least five years during which they would generally require no modification unless circumstances changed significantly. The Implementation Plans were submitted in draft form in 2006 and in final form in 2007. If the 'Next Steps' Review Group recommended and the Council agreed, a new reporting cycle could commence in 2012 with the submission of new Implementation Plans. If this is the preferred approach, then the FAR reporting might recommence in 2013 and, if the same order is followed as in the first cycle, then the sequence might be as follows: management of salmon fisheries (2013); habitat protection, restoration and enhancement (2014); and aquaculture and related activities (2015). Additional guidance could be developed for future Review Groups and jurisdictions to ensure that the issues highlighted in this review and any others raised by the 'Next Steps' Review Group are addressed in the next cycle

5. In Conclusion

The feedback we have received suggests that the reporting and evaluation process was a very valuable experiment where we all learnt an enormous amount about the ways that different Parties manage the many conservation issues that arise. It must be a very good thing that we can learn from each other in that way. One of our important aims here was to improve commitment, transparency and inclusivity. Commitment to carrying out the review process at all was to be commended; it gave vital information, allowed criticism and comment. It may not always have been comfortable but it was more transparent and inclusive than any previous review, probably more than any other international organization has achieved. The Council has certainly made real progress in moving from a rather onerous annual reporting system that fulfilled the requirement to report but did not allow for a valuable exchange of information and assessment of progress.

With some adjustments the Focus Area Review process should stand NASCO well in the future, but it would benefit from more consistency in reporting and a greater focus on outcomes. Having gone through the process once we should be able to improve on all of these and make the work of submission less onerous at the same time. It is also worth noting that the process has produced a really significant bonus in that we have emerged with Guidelines on all three focus areas (fisheries management, habitat and aquaculture) that should assist in the preparation of future Implementation Plans and FARs and their evaluation. These will prove highly valuable in future as a measure of how far and how fast we are progressing along the course that we set out in 2005. The Next Steps Review Group may wish to discuss the following questions in order to assist in developing its recommendations to the Council:

1. Should future reporting follow the format used in the first reporting cycle of a 5-year Implementation Plan, triennial Focus Area Reports and Annual Reports, or should new reporting arrangements be considered?
2. Should the next reporting cycle commence with Implementation Plans (e.g. in 2012) followed by FARs in the following three year period, or should a new cycle be considered?
3. Should the same sequence of FARs be followed as for the first reporting cycle e.g.. management of salmon fisheries (2013), habitat protection restoration and enhancement (2014) and aquaculture and related activities (2015), or should a new sequence be considered?
4. Should the Implementation Plans and FARs continue to be reviewed by *Ad Hoc* Review Groups with the same composition as for the first reporting cycle, or should alternative structures for the review process be considered?
5. Should the Implementation Plans and FARs use the existing guidance on format and content or should new guidance be developed based on experience gained and the guidelines adopted during the first reporting cycle?
6. Should future reporting in the FARs be focused more on the effectiveness of actions taken rather than on the nature of the actions implemented?
7. Should the format for Annual Reports adopted in 2009 continue to be used, or should an alternative format be developed?
8. Should the same timetable be used as in the first reporting cycle i.e. Implementation Plans and FARs submitted by 31 December, draft review presented the following June and the final review the year after?
9. Should Special Sessions continue to be used for presentation of the reviews (both in draft and final form)? If so, can they be improved in any way?

Secretary
Edinburgh
2 February 2011

NS(11)7

Draft NGO Position Paper**1. Changing the NASCO Convention**

During the initial discussions on the future of NASCO in 2004, NGOs argued that the NASCO convention should be strengthened to give the organisation more “teeth”. This was rejected by the Parties in favour of the ‘Next Steps’ process. Now we have completed the first cycle of ‘Next Steps’, NGOs acknowledge gains from the process in terms of transparency and participation, but continue to be disappointed by a lack of outcomes relating to material improvements in wild salmon conservation. We consider that this is an appropriate time to re-examine the convention.

The forthcoming external review of NASCO is part of a wider UN initiative to review RFMOs. From a UN point of view, it may be appropriate to highlight the poor conservation status of Atlantic salmon and the very slow progress by Parties to fully implement NASCO guidelines in home-waters. We appreciate that this is often because of social, economic or political problems. Strengthening the convention would assist Parties in implementing salmon conservation measures.

Atlantic salmon is an international traveller; NASCO was set up in 1984 to manage exploitation in the high seas fisheries, which it has done very successfully. When it became apparent that the problems were much wider, NASCO introduced a series of agreements and guidelines (habitat, fisheries management, impacts of aquaculture) but these are all voluntary since the convention does not extend NASCO jurisdiction into home-waters. The UN resolution lists the objective of sustainable fisheries, the adoption of the precautionary approach and the recognition of best scientific advice. Despite some progress over the years, ICES advice to NASCO on mixed stock fisheries is routinely being disregarded and despite the adoption of the precautionary approach, Parties appear to pick and choose if or when to apply it.

The NGO position is to argue for convention change, while promoting more focus on outcomes in the next cycle of Implementation Plans and Focus Area Reports.

The example of EU Directives e.g. Habitat, WFD etc. could be helpful: these Directives are binding on the member states but how they are implemented remains the prerogative of individual jurisdictions. The single most dramatic salmon conservation gain in recent years was the closure of the Irish drift net fishery in 2007 following a challenge under the Habitats Directive from Wessex Salmon (UK NGO). The Habitats Directive is now being used to challenge the impacts of salmon aquaculture in the Irish Republic. NGOs believe that the “Directive” model is one which could be considered by NASCO.

All these arguments could be helped by the fact that convention change is being considered as part of current reviews of other regional fishery management organisations (RFMOs) under the UN resolution.

NGOs believe that the time has come for changes to the NASCO convention to assist the Parties in implementing salmon conservation measures in home waters.

2. Proposed changes to the convention for consideration

This list includes a range of suggestions from a number of sources including NGOs and former delegation members; some are minor and some major changes. NGOs are not experts in the language of the convention and it may be that some of these proposals, which are all aimed at strengthening the role of NASCO in salmon conservation, could be achieved by other means.

- a. Re-define “High seas fisheries” to “distant water fisheries”. (Greenland and Faroes are fishing within their EEZs, not on the high seas).
- b. NAC. To include consideration of 1sw fish (grilse) jurisdictions have interpreted the convention to apply to msw salmon, but the recovery of grilse means they are now an important part of the stock complex.
- c. NAC. Changes required to enable Greenland (and possibly St P & M) to intercede with other Parties on interception.
- d. NEAC. Changes required to allow Parties to intercede with each other on interception. At present NGOs have to bring these matters up! Examples might be Russia proposing a regulatory measure for the Norwegian coastal fishery, or Norway proposing a measure to limit stocking of alien species (Pacific salmon) by Russia.
- e. NASCO guidelines and agreements to become “mandatory” for Parties in home waters, with the provision for both derogation (exclusions in particular circumstances) and infraction proceedings (penalties) for failure to meet targets. The example of EU Directives here is informative; these Directives are binding on member states but allow individual jurisdictions freedom of implementation. This approach may be more palatable than use of the word “mandatory”.

This suggestion is the most contentious and needs to be considered carefully.

It is likely that most support would be forthcoming from certain Parties for applying this to fishery management (and mixed-stock fisheries) in home-waters which continue to operate in contravention of ICES advice. Derogations for aboriginal fisheries or other exceptional cases would be required.

It is much less clear how this could apply to the application of the precautionary approach but in the case of aquaculture, the conservation goals of both the BMP guidelines and the Williamsburg resolution should all be binding while the methods of achieving them could remain as guidance, with the responsibility for implementation resting where it belongs, with the Parties.

NGOs request that serious consideration is given to these suggestions by the Secretariat and Review Group.

Chris Poupard
NASCO NGO Chairman
21.03.11

CNL(11)44

***Terms of Reference
for an External Performance Review of NASCO's Work***

Background

1. Commencing in 2004, NASCO undertook a comprehensive and critical review of its work. This review, called the 'Next Steps' for NASCO, identified the challenges facing NASCO in the management and conservation of wild Atlantic salmon and ways to address these; reviewed the management and organizational structure of NASCO; and considered the procedural aspects of NASCO and the relationship between the Organization, its Parties and stakeholders. This work was conducted by a Working Group comprising representatives of the Parties and the NGOs and involved open consultation meetings with stakeholders in Europe and North America. It resulted in the adoption of a Strategic Approach for NASCO's 'Next Steps', CNL(05)49, which contained recommendations for action in relation to three main challenges. These were:
 - Implementation, commitment and accountability;
 - Transparency and inclusivity; and
 - Raising NASCO's profile.

Progress to date

2. The Council has moved rapidly to address these challenges. In relation to implementation, commitment and accountability, the jurisdictions developed Implementation Plans in 2007 and have reported annually on progress (according to a new agreed format) and on a three year cycle through in-depth focus area reports (FARs). These FARs have been subject to review, which resulted in recommendations for additional actions to improve commitment to NASCO's agreements. FARs have been prepared and reviewed relating to management of salmon fisheries (2008); habitat protection, restoration and enhancement (2009) and aquaculture and related activities (2010). The first cycle of FAR reporting and review will be completed in 2011. The review process has also led to the adoption of guidelines on management of salmon fisheries and guidelines on habitat protection, restoration and enhancement. The Aquaculture and related activities FAR Review Group was also asked to develop recommendations on best practice. However, this work was conducted through a Task Force set up by the ISFA/NASCO Liaison Group which has developed Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon. This BMP Guidance was adopted by the Council and the International Salmon Farmers Association (ISFA) and has been reviewed and supported by the aquaculture and related activities FAR Review Group.
3. With regard to transparency and inclusivity, procedures have been agreed to allow greater involvement of the NGOs in NASCO's work through the opportunity to contribute on all agenda items in the Council and Commissions (other than finance and

administrative matters) and participation in Committees, the IASRB and Working Groups. To raise NASCO's profile, a Public Relations Group was established to develop a PR strategy, and both the NASCO and IASRB websites have been redesigned.

4. Thus, NASCO has conducted a thorough, wide-ranging and open performance review of its activities, and in the five years since the adoption of the Strategic Approach it has moved rapidly to implement the broad-ranging changes that were proposed. The NGOs have welcomed these changes. In 2011, a 'Next Steps' Review Group was established *inter alia* to review the 'Next Steps' process, highlighting what this process had delivered, where it had worked well and making recommendations for any actions required to ensure that all the recommendations in the Strategic Approach for NASCO's 'Next Steps' had been implemented. The report of this Review Group is contained in document CNL(11)12.

Further Performance Review

5. During the implementation of the recommendations in the Strategic Approach for NASCO's 'Next Steps', the United Nations' General Assembly adopted a Resolution (61/105) in December 2006 concerning sustainable fisheries. This Resolution includes recommendations concerning the performance of Regional Fisheries Management Organizations (RFMOs). These include the following:
 - urging further efforts by RFMOs to strengthen and modernise their mandates and the measures adopted to reflect modern approaches to fisheries management including relying on the best scientific information and application of the Precautionary and Ecosystem Approaches;
 - urging RFMOs to improve transparency and to ensure that decision-making processes are fair and transparent, rely on best scientific information and incorporate the Precautionary and Ecosystem Approaches; and
 - urging States, through participation in RFMOs, to undertake, on an urgent basis, performance reviews of those RFMOs initiated either by the organization itself or with external partners.
6. At its 2010 Annual Meeting, the Council decided to undertake a further performance review and asked that the 'Next Steps' Review Group develop proposals for consideration by the Council on Terms of Reference, criteria and a budget for the external review. The elements below reflect the initial proposals contained in document CNL(10)48, and the discussions within the 'Next Steps' Review Group.

Terms of Reference

7. The Council agrees to conduct an external review of NASCO's work with the purpose of assessing the performance of NASCO since its establishment in 1984 against the objectives set out in its Convention and other relevant international instruments addressing the conservation and management of aquatic living resources. This review should take into account, *inter alia*, the NASCO 'Next Steps' process, the recommendations concerning the performance of RFMOs contained in UN Resolution

61/105, and other subsequent resolutions on sustainable fisheries, and the criteria attached, as appropriate.

8. This review will be undertaken by a Review Panel comprising three internationally recognised experts: nominees from the Food and Agriculture Organisation of the United Nations and the United Nations Division of Ocean Affairs and the Law of the Sea (DOALAS), together with a fisheries scientist with management experience, appointed by the Council at its Twenty-Eighth Annual Meeting. NASCO Parties and NASCO's accredited NGOs will not serve on the Review Panel nor will the NASCO Secretariat which will, however, provide logistical support to the panel.

Timing

9. In the light of the fact that NASCO has already completed a transparent and comprehensive review of its work, and assessed progress in implementing the Strategic Approach that arose from this review, the Review Panel will meet at NASCO's Headquarters for a period of 3 - 4 days early in 2012. The Review Panel may hold a second meeting if they so wish. The Panel should complete its work no later than 1 April 2012 so that its report can be circulated to the Parties and accredited NGOs prior to the Twenty-Ninth Annual Meeting of NASCO. The report will be presented by a member of the Review Panel. Reasonable travel and subsistence costs associated with attendance at the Review Panel's meeting and for a member of the panel to attend NASCO's Annual Meeting will be reimbursed. An honorarium may also be payable if requested.

POSSIBLE CRITERIA

	Area	General criteria	Detailed criteria
1	<i>Conservation and management</i>	Status of living marine resources	• Status of marine living resources under the purview of NASCO. • Trends in the status of those resources. • Status of species that belong to the same ecosystems as, or are associated with or dependent upon, targeted marine living resources. • Trends in the status of those species.
		Ecosystem approach	• Extent to which NASCO decisions take account of and incorporate an ecosystem approach to fisheries management.
		Data collection and sharing	• Extent to which NASCO has agreed formats, specifications and timeframes for data submissions. (e.g. as set out in Annex 1 of the 1995 UN Fish Stocks Agreement). • Extent to which NASCO Contracting Parties, individually or through NASCO, collect and share complete and accurate data concerning marine living resources and other relevant data in a timely manner, including analysis of trends in fishing activities over time. • Extent to which fishing and research data and fishing vessel and research vessel data are gathered by NASCO and shared among Parties. • Extent to which NASCO is addressing any gaps in the collection and sharing of data as required.
		Quality and provision of scientific advice	• Extent to which NASCO produces or receives the best scientific advice relevant to the marine living resources under its purview, as well as to the effects of harvesting, research, conservation and associated activities, on the marine ecosystem.
		Adoption of conservation and management measures	• Extent to which NASCO has adopted measures based on the best scientific advice available to ensure the long-term conservation and sustainable use of marine living resources in the Convention Area. • Extent to which NASCO has applied a Precautionary Approach as set forth in Article 6 of the 1995 UN Fish Stocks Agreement, including the application of precautionary reference points. • Extent to which consistent/compatible management measures have been adopted (e.g. as set out in Article 7 of the 1995 UN Fish Stocks Agreement).

			• Extent to which NASCO successfully allocates fishing opportunities consistent with the NASCO Convention and Article 11 of the 1995 UN Fish Stocks Agreement. • Extent to which NASCO has moved toward the adoption of conservation and management measures for previously unregulated fisheries, including new and exploratory fisheries. Extent to which NASCO has taken due account of the need to conserve marine biological diversity and minimize harmful impacts of fishing activities and research on living marine resources and marine ecosystems. • Extent to which NASCO and its Parties have adopted and are implementing effective rebuilding plans for depleted or overfished stocks including guidance for stocks under moratoria.
		Capacity management	• Extent to which NASCO has taken actions to prevent or eliminate excess fishing capacity and effort. • Extent to which NASCO monitors the levels of fishing effort, including taking into account annual notifications of participation by Parties.
2.	<i>Compliance and enforcement</i>	Flag State duties	• Extent to which NASCO Parties are fulfilling their duties as flag States under the NASCO Convention, pursuant to measures adopted by NASCO, and under other international instruments, including, <i>inter alia</i>, the 1982 Law of the Sea Convention, 1995 UN Fish Stocks Agreement and the 1993 FAO Compliance Agreement, as applicable.
		Port State measures	• Extent to which NASCO has adopted measures relating to the exercise of the rights and duties of its Parties as port States, as reflected in Article 23 of the 1995 UN Fish Stocks Agreement, as well as the minimum standards set out in the 2009 FAO Agreement on Port State Measures to Combat IUU Fishing. • Extent to which these measures are effectively implemented.
3.	<i>Decision-making and dispute settlement</i>	Decision-making	• Efficiency of NASCO in addressing critical issues in a timely and effective manner. • Extent to which NASCO has transparent, consistent and adequate decision-making procedures that facilitate the adoption of conservation and management measures in a timely and effective manner.

		Dispute settlement	• Extent to which NASCO has established adequate mechanisms for resolving disputes.
4.	<i>International cooperation</i>	Transparency	• Extent to which NASCO is operating in a transparent manner, taking into account Article 12 of the 1995 UN Fish Stocks Agreement. • Extent to which NASCO decisions, meeting reports, scientific advice upon which decisions are made, and other relevant materials are made publicly available in a timely fashion.
		Relationship with non-NASCO Parties	• Extent to which non-NASCO Parties have undertaken fishing activities in the NASCO Regulatory Area. • Extent to which NASCO facilitates cooperation with non-NASCO Parties, including encouraging non-NASCO Parties to become Parties or to implement NASCO conservation and management measures voluntarily. • Extent to which NASCO provides for action in accordance with international law against non-NASCO Parties undermining the objective of the Convention, as well as measures to deter such activities.
		Cooperation with other international organisations	• Extent to which NASCO cooperates with Regional Fisheries Management Organizations and other international organisations.
5.	<i>Financial and administrative issues</i>	Availability of resources for activities	• Extent to which financial and other resources are made available to achieve the aims of NASCO and to implement NASCO's decisions. • Extent to which the schedule and organization of the meetings could be improved.
		Efficiency and cost effectiveness	• Extent to which NASCO is effectively managing human and financial resources including those of its Secretariat.

CNL(11)14

Report of the NASCO/North Atlantic Salmon Farming Industry Liaison Group

1. The Liaison Group held its 2011 meeting on 18 and 19 March in Boston, USA and its report is attached. At this meeting, the Liaison Group, *inter alia*, reviewed the final report from the Aquaculture, Introductions and Transfers and Transgenics FAR Review Group, considered reporting arrangements on the BMP Guidance, agreed on possible actions to improve communication of the Liaison Group's work, and discussed the evolution of the Liaison Group.
2. With regard to the FAR Review Group's report, the Liaison Group agreed the following response:
 - The Liaison Group thanks the Review Group for its report, complete with its 8 annexes, and encourages NASCO's Parties to make full use of the wealth of information provided;
 - Going forward, NASCO Parties should carefully consider the following in its 'Next Steps' process:
 - the extent of NASCO's role with respect to aquaculture, introductions and transfers and transgenics;
 - the roles and responsibilities of the Parties, industry and NGOs with respect to NASCO's role;
 - activities and studies that would best serve NASCO's role going forward.
3. With regard to reporting on the BMP Guidance, the Liaison Group noted that the 'Next Steps' for NASCO review would be considering future reporting in relation to all of NASCO's agreements, and agreed to reconsider the reporting requirements under the BMP Guidance in the light of this review. On the matter of improving communications, the Liaison Group recommends that the ISFA and NASCO Secretariats should liaise on the information to be presented on the ISFA and NASCO websites concerning the work of the Liaison Group (the NASCO website contains a considerable amount of information already) and the presentation of the BMP Guidance as a booklet and on the website. A proposal from Canada on the reconstitution of the Liaison Group was discussed. A number of options were considered and ISFA indicated after the meeting (see Attachment 1) that it would prefer to engage directly with the Parties through a seat at the NASCO Annual Meeting, consistent with that afforded to the NGOs. The views of the 'Next Steps' Review Group on this matter are contained in document CNL(11)12. The Liaison Group elected Mr Steinar Hermansen (Norway) to be its next Chairman and recommends changing its constitution to allow for appointment of a Vice-Chairman.
4. The Council is asked to consider the report of the meeting of the Liaison Group and agree on any actions needed in the light of the recommendations made.

Secretary
Edinburgh
7 April 2011

SLG(11)7

Report of the Meeting of the NASCO/North Atlantic Salmon Farming Industry Liaison Group

***Marriott Courtyard Hotel, Boston, USA
18 - 19 March 2011***

1. Opening of the Meeting

- 1.1 The Chairman of the Liaison Group, Mr Sebastian Belle, opened the meeting and welcomed participants to Boston. Dr Malcolm Windsor, Secretary of NASCO, thanked ISFA for the arrangements made and for hosting the meeting.
- 1.2 A list of participants is contained in Annex 1.

2. Appointment of a Rapporteur

- 2.1 Under the Liaison Group's Constitution, the posts of Chairman and Rapporteur are held alternately by representatives of NASCO and ISFA. Dr Peter Hutchinson (NASCO) was appointed Rapporteur for the meeting.

3. Adoption of the Agenda

- 3.1 The Liaison Group adopted its agenda, SLG(11)5 (Annex 2). The NGO representative proposed that there might be a standing agenda item for future meetings dealing with 'Closed Containment'. The Liaison Group recognised that one of the factors identified as facilitating implementation of the BMP guidance was technology development, so this aspect should be covered under future reporting on the Guidance.

4. Reporting arrangements on the BMP Guidance

- 4.1 At its 2010 meeting, the Liaison Group had recognised the importance of being able to track progress towards achievement of the international goals in the BMP Guidance and noted that there is already reporting under the Implementation Plans in terms of both annual reports and triennial focus area reports (FARs). There is a need to carefully consider the scope of any additional reporting, so as to avoid duplication of reporting effort while ensuring that progress towards the international goals can be tracked. The Liaison Group had decided to set up a Sub-Group to advise on reporting needs, and NASCO had subsequently agreed that the reporting requirements under the BMP Guidance should be considered by the Task Force that had developed this guidance.
- 4.2 The Liaison Group reviewed document SLG(11)3 which provided a draft format for reporting that had been developed by Mary Colligan, Co-Chair of the Task Force. The Group noted that the format was based closely on the BMP Guidance but did not include elements for reporting on factors facilitating implementation. The view was expressed that the industry is developing rapidly in terms of deployment of new technology and practices to meet new challenges, so it is important that any reporting

process can accommodate such change. It was suggested that there is a need to consider the purpose of the reporting, for it to cover all three elements of the BMP Guidance and to be focused more on outcomes. The BMP Guidance provides useful guidance on the information that would support tracking of progress towards the international goals while providing a menu of management practices that might be implemented. With regard to avoiding duplication of reporting effort, while allowing monitoring of progress towards the international goals, the Group noted that the 'Next Steps' for NASCO review would be considering future reporting in relation to all of NASCO's agreements and the Liaison Group agreed to reconsider the reporting requirements under the BMP Guidance in the light of this review.

5. Final Report of the Aquaculture and Related Activities Focus Area Review Group

- 5.1 At the Liaison Group's 2010 meeting, the draft report of the aquaculture, introduction and transfers and transgenics FAR Review Group was presented. The Review Group had been asked to: review and analyse the FARs, identifying common challenges and management and scientific approaches to these challenges; compile recommended best practice; and develop recommendations and/or feedback on each FAR where additional actions may be helpful to ensure implementation of the commitments within the Williamsburg Resolution. The Liaison Group had discussed the review process and a number of views were expressed. ISFA had agreed to provide comments on the Review Group's report and these comments, CNL(10)33, were tabled at NASCO's Twenty-Seventh Annual Meeting. NASCO's NGO's had tabled a response to these comments, CNL(10)37. The Council had agreed that the Review Group should complete its Terms of Reference so that its final report could be considered by the Liaison Group at its 2011 meeting and by the Council at its Twenty-Eighth Annual Meeting. In finalising its report, the Group had been asked to complete its terms of reference and to take into account the comments on its draft report from the Parties, ISFA and the NGOs.
- 5.2 The Review Group's final report, IP(10)39, was introduced by the Coordinator, Dr Malcolm Windsor, who described the background and the Group's working methods. He noted that the process of liaison between NASCO and ISFA has been ongoing for many years; sometimes it had worked well and at other times not so well and the process had needed to be reinvigorated. A good example of its success was the development of the BMP Guidance. However, he believed that the Liaison Group may be reaching a crucial point given the response from ISFA to the Review Group's draft report and the statement that the recently agreed BMP goals were 'inherently unachievable and unrealistic'. Two of the reviewers, Mr Tim Sheehan and Ms Boyce Thorne Miller, then summarised the Group's main findings. The presentation is contained in Annex 3. Since its first meeting the Group had reviewed the comments from ISFA, the NGOs and the Parties and the discussions at the Special Session. In the light of the information provided by the jurisdictions the Group had, where appropriate, revised its assessments. However, it had not taken into account the additional information provided by ISFA relating to the measures in place because it was the jurisdictions that were responsible for submitting the FARs. The Review Group had also reviewed a FAR from EU-Ireland and commented on a document from EU-Spain. It had completed its TORs by developing an overview of common challenges and approaches to addressing these challenges. The Liaison Group welcomed the presentation and expressed its appreciation to the Review Group for its work.

- 5.3 During the discussion of the Review Group's report it was agreed that any future feedback from the industry should be included in the responses from the jurisdictions to the Review Group so that this could be taken into account in finalising the assessments. ISFA representatives indicated that they sought to cooperate with the wild fish interests in the FAR reviews and raised the issue of openness of the process. In particular, the Liaison Group felt that there was a need for both the NGOs and the industry to be fully involved in the development of FARs within jurisdictions, should this be required in the future. It was noted that the industry is rapidly changing and industry involvement in developing the FARs would ensure that the most recent information was included. The Liaison Group agreed with the Review Group's recommendation that for future reporting the process would be more transparent if the FARs were made available on the NASCO website when they are issued to the Review Group.
- 5.4 The view was expressed that the Review Group's statements about the lack of focus on outcomes in the FARs was not consistent with the Group's TORs. However, it was noted that an element of the reporting format for each of the three focus areas related to the effectiveness of management measures but that each Review Group had highlighted the lack of reporting on this element in most FARs. The Liaison Group noted that the 'Next Steps' review would consider if future FARs should be focused more on outcomes of the measures taken. Some concerns were expressed about the nature of the reporting template developed by the Council of NASCO which was heavily focused on salmon farming. While it was recognised that this reflected the existence of both those sections of the Williamsburg Resolution dealing with salmon farming and the BMP Guidance, this aspect would need to be considered carefully for future reporting and the Liaison Group believed that there should be additional focus on stocking and other forms of aquaculture activities. ISFA representatives also felt that the tone of the review was rather negative and that in future there should be greater focus on positive aspects. In this regard, the Overview in Annex 8 of the report contained some useful information and provided a helpful summary of the approaches being used to address impacts of aquaculture on the wild stocks. It was also stressed that the assessments had been structured in such a way as to highlight positive aspects from each FAR before detailing where additional actions would be needed to ensure consistency with NASCO's agreements. It was noted that NASCO was not just focusing on salmon farming but had conducted similar reviews in relation to management of salmon fisheries and habitat protection and restoration. In the past, reports on NASCO's work had been made to the Liaison Group but the Council of NASCO had agreed that the Chairman or Rapporteur of the Liaison Group, when these posts are held by ISFA, could attend NASCO's meeting so as to contribute to the agenda item dealing with that Group's report. This provided an opportunity to hear about other aspects of NASCO's work. The Liaison Group felt that it might be helpful, however, if future agendas for its meetings included an item for reporting on NASCO's work. This feedback on the Review Group's report would be presented to the Council of NASCO and would be considered in the 'Next Steps' review.
- 5.5 The ISFA representatives confirmed that they were fully committed to the international goals in the BMP Guidance but had been concerned that if the assessment was undertaken in relation to full achievement of these goals then the outcome would be that all jurisdictions would be seen to fail, despite any progress made. It is important, therefore, that the review process assesses progress towards the international goals.

5.6 The Liaison Group agreed the following response to the Review Group report:

- The Liaison Group thanks the Review Group for its report, complete with its 8 annexes, and encourages NASCO's Parties to make full use of the wealth of information provided;
- Going forward, NASCO Parties should carefully consider the following in its 'Next Steps' process:
 - the extent of NASCO's role with respect to aquaculture, introductions and transfers and transgenics;
 - the roles and responsibilities of the Parties, industry and NGOs with respect to NASCO's role;
 - activities and studies that would best serve NASCO's role going forward.

6. Matters Arising since the last Liaison Group Meeting

(a) Update on the *Salmotrip* project

- 6.1 The Williamsburg Resolution identifies, as an area for research and pilot testing, the production of sterile fish. It recognises that the methodology and techniques for sterilisation are now well developed and that research should focus on developing strains of sterile fish which could perform at a level similar to current strains of fish used in farm production. The use of sterile fish could contribute to addressing concerns about genetic and other interactions between wild and farmed salmon but previous studies highlighted production performance and welfare issues and there are industry concerns about consumer perceptions of sterile salmon.
- 6.2 A progress report on the *Salmotrip* project was presented, SLG(11)2 (Annex 4). *Salmotrip* is a full-scale feasibility study of the potential for the production of triploid salmon that will provide information to support decision-making regarding future aquaculture policies and the use of triploidy within the salmon farming industry. The project, which will conclude in June 2011, is focusing on the various concerns about the use of triploid salmon that were highlighted by the industry at the Liaison Group's Trondheim Workshop concerning performance, incidence of deformities and marketing issues. Findings to date indicate that the performance of triploids in fresh water is equal to or better than diploids of the same families, and in some families the growth of triploids was markedly (~30%) better than that of diploids. There are also indications that this improved performance can be maintained in the sea, but an increased incidence of deformities and cataracts in triploids, albeit generally not severe, was again detected and will be a concern for the industry. However, the scientists involved in the *Salmotrip* project suggest that through selection of optimal strains and development of triploid specific diets these issues can be addressed, as has been the case for diploid stocks. They conclude that the potential for using triploid salmon looks promising. Further studies will focus on adapting rearing practices to the needs of triploid stocks. It is intended that one of the outputs from the project will be detailed protocols on the rearing of triploid salmon. The Liaison Group welcomed the findings to date and agreed that it would be useful to have a further progress report once the data analysis is complete. The Group recognised the importance of further studies in relation to optimal rearing practices before triploid salmon could be considered for use in commercial production. The industry representatives questioned the finding from the consumer survey that perceptions of the salmon farming industry

were generally negative; this is contrary to much other consumer research that has been undertaken.

(b) New research on the consequences of interbreeding between farmed and wild salmon

- 6.3 At its 2010 meeting, the Liaison Group had recognised the risks involved to the wild stocks from interbreeding with escaped farmed salmon and had agreed that it wished to be informed of the results of any new studies on this topic. The Group noted that summary information on ongoing research had been presented in the Comparative Overview contained in Annex 8 of the Review Group's report, (IP(10)39). This indicated that work was ongoing to develop genetic markers to distinguish farmed and wild salmon and that modelling studies were being undertaken to assess changes in the genetic composition of wild stocks as a consequence of interbreeding with escaped farmed salmon. It was also noted that under the SALSEA-Merge project considerable advances have been made in establishing genetic baseline data on wild Atlantic salmon.

(c) Development of standardised categories of escape events

- 6.4 In 2001, the Liaison Group had developed Guidelines on Containment of Farm Salmon which were incorporated into NASCO's Williamsburg Resolution. These Guidelines apply to both freshwater and marine environments. In accordance with the guidelines, each jurisdiction is requested to draw up a national action plan on containment (or regional plans) based on the guidelines. To assist the jurisdictions in reporting on progress with the implementation of its action plan on containment, a reporting format had been agreed and has been used by jurisdictions, since 2002, to report information to the Liaison Group including information on the level and causes of escapes. The Liaison Group's Task Force had recommended that standardised categories of causes of escape events might be developed. At its last meeting the Liaison Group had been advised that the Escapes Commission in Norway would be reporting shortly and that its report would include a categorisation of escape events. Similarly, some other jurisdictions have developed or are developing such categorisation. The Liaison Group had, therefore, agreed that it would be helpful if each jurisdiction provided details of the categories of escape events currently being used with a view to further considering the need for standardised categories for use in reporting internationally.
- 6.5 Norway reported that categories of escapes had been developed by its Escapes Commission and the Directorate of Fisheries based on the analysis of 325 escape events over a five year period. A three level categorisation system has been established. The first level details the type of operation (e.g. cage facility, landbased operation, slaughtering facility and transportation). The second level then describes the component involved in the event (e.g. cages, net pens, boats, other equipment) and the third level describes the reason for the escape event (e.g. icing, failure of the mooring system). This information is used to conduct a risk assessment to inform development of regulations and management of the industry. It was noted that in Norway there are technical standards for equipment in the sea and technical standards are also being developed for facilities on land. There is now considerable focus on salmon farm operations since escapes related to technical failure are declining and in this regard courses for fish farm workers are held throughout Norway. Similarly, in Scotland and the US there is increasing focus on operational issues that lead to escapes and provision of training for farm staff. In Scotland, reporting has become more specific focusing on the cause of the escape event. In Canada, it was noted that many companies are seeking third party

certification, conducting proactive maintenance and maintaining more detailed records of escapes.

- 6.6 The Liaison Group recognised that in considering the risks to the wild stocks from escaped farmed salmon it is important to consider not only the number of fish escaping but also information on the life stage and time of year of the escape, which influence survival, and the number of escaped fish in rivers. The BMP Guidance refers to reporting and tracking to allow progress towards the international goals for containment to be assessed. However, the Liaison Group agreed that it would need to revisit the issue of reporting in relation to the BMP Guidance in the light of NASCO's review of its 'Next Steps' process.

(d) Site selection and relocation criteria

- 6.7 The Secretary of NASCO noted that the Liaison Group had asked that a collation of information on the site selection and approval process in each jurisdiction with salmon farming be collated based on information contained in the FARs. He indicated that the Liaison Group recognised that this matter is specific to each jurisdiction and it would, therefore, reconsider its role in relation to this issue in the light of the review. While a collation of information had not been prepared for each jurisdiction, summary of information had been included in Annex 8 of the Review Group's report (see item 5 above).
- 6.8 The Group was advised that in Norway an expert group has recently reported on approaches to securing the salmon farming industry access to productive coastal areas with guidance on management focusing on health and welfare, acceptable environmental impacts and prevention of escapes. The groups report contains 25 recommendations with three main elements. First, the coastal zone should be divided into 20 -25 large production areas, each of which would be divided into four or five smaller management areas with coordinated stocking and fallowing of sites in a two year cycle. Secondly, a set of indicators would be used to improve sustainability in the industry. These would include the number of escaped farmed salmon in rivers and sea lice levels in farms and would be used to identify the need for remedial action such as a reduction in the total permitted biomass in an area and systematic removal of escaped farmed salmon from rivers. Thirdly, the industry should be given greater responsibility for designing and implementing more effective contingency plans. The report also identifies improvements to laws and regulations, particularly with regard to the planning process, and research needs.
- 6.9 The Group recognised that each jurisdiction would have site selection and relocation criteria that reflect local conditions and that information on this issue is available in the FARs which are available on the NASCO website.

(e) Possible development of a Decision Tree to assist in applying the BMP Guidance

- 6.10 The Task Force had discussed if the development of a Decision Tree might assist jurisdictions in implementing the BMP Guidance. It had not proceeded with this because it felt that information on how the BMP Guidance was being applied by each jurisdiction in terms of both voluntary and regulatory measures and their effectiveness would be provided in the FARs, although not necessarily in a Decision Tree format. The Task Force had recommended, therefore, that the Liaison Group review the need for a high

level Decision Tree(s) following presentation of the FARs. Three documents tabled at the Task Force meeting, ATF(09)14 (Draft Decision Trees on Measures for Containment of Farmed Salmon and Treatment of Sea Lice), ATF(09)17 (Recommendations on a New Role for Single Bay Management for Sea Lice Control in Ireland) and ATF(09)18 (Decision Tree for Applications for Salmon Farming Licences in Norway), had been distributed to the Liaison Group for information. It was noted that there had been a change to the Decision Tree for Norway as applications are now considered by the County Municipalities although the process shown is unchanged.

- 6.11 The Liaison Group recognised that each jurisdiction with salmon aquaculture would have a Decision Tree(s) or a decision-making process and agreed that there was no need to develop Decision Trees to assist in the implementation of the BMP Guidance. Where jurisdictions had developed Decision Trees, however, they may wish to make them available to Liaison Group for information. The Group agreed that it is more important for NASCO to focus on outcomes rather than the approach used in each jurisdiction towards achievement of the international goals and this theme would be considered further in the review of the NASCO 'Next Steps' process.

(f) Research requirements relating to the management of the impacts of aquaculture on wild salmon stocks

- 6.12 The Liaison Group noted that information on on-going research relating to the management of impacts of aquaculture on the wild salmon stocks was presented in the FARs and summarised in Annex 8 of the Review Group's report (see section 5 above). The Liaison Group agreed to consider this issue further at its next meeting.

(g) Communications

- 6.13 The Task Force had recommended that the BMP Guidance and the Explanation of Terms used in the BMP Guidance be printed in booklet form in the same format as the Williamsburg Resolution and widely circulated by ISFA and NASCO. NASCO's other guidelines relating to management of salmon fisheries and habitat protection and restoration had also been published in booklet format and widely circulated. It was noted that the BMP Guidance and the Explanation of Terms Used in the Guidance are available as documents on the NASCO website and consideration should be given to making these available in a well-designed booklet. It was noted that ISFA has developed a new website that would be available shortly and that links should be made between the NASCO and ISFA sites. It was agreed that the NASCO and ISFA Secretariats should liaise on the issue of communications including the information to be made available on the websites concerning the work of the Liaison Group and the presentation of the BMP Guidance. Final recommendations relating to communications would be circulated to the Group before being implemented. There might also be consideration of the establishment of a 'SharePoint' site.

7. Evolution of the Liaison Group

- 7.1 The Group discussed a proposal from Canada for the reconstitution of the Liaison Group to become the collaborative Working Group on Aquaculture - Wild Salmon Interactions, SLG(11)4 (Annex 5). In presenting the document, Canada made reference to the fact that this might be taken into account in the review of the 'Next Steps' process. The document recommended that the Parties build on the momentum

from the success of the Task Force and the resulting BMP Guidance to clearly focus collaboration to address interactions between aquaculture and wild salmon stocks. It proposed that the Liaison Group be reconstituted into a group with similar membership to the Task Force. The proposal suggested that the mandate of this group would be to support implementation of the BMP Guidance by the NASCO jurisdictions through a process of information exchange and coordination of monitoring, research and development.

- 7.2 The Liaison Group thanked Canada for preparing this document which raised some interesting ideas although as it had been circulated just prior to the meeting there had been limited time to consider it and consult. Clarification was sought as to whether this proposal meant that the Liaison Group would cease to exist. A number of possible options were discussed relating to the future of the Liaison Group. The need to maintain a forum for dialogue on questions related to wild salmon and aquaculture was recognised but it was noted that there had been significant changes since the Liaison Group was established that allowed for information exchange. These include the development of the FARs by NASCO's jurisdictions and a number of other fora for discussions between the industry and wild fish interests. The options considered for the evolution of the Liaison Group included maintaining the present Group, which might meet annually or biennially, and which could refer specific tasks to its Task Force. Another suggestion was that the Liaison Group meetings might be held in conjunction with NASCO's Annual Meetings, possibly immediately preceding those meetings. Alternatively, two or three representatives of ISFA could be invited to attend the NASCO Annual Meeting to contribute to the agenda item concerning aquaculture (including any Special Sessions). If any specific issues arose these could be agreed at the Annual Meeting and referred to a Task Force, if required. This would reduce the resources required for the Liaison process but would greatly reduce the time available for discussions. The Secretary indicated that it was important that ISFA advise which was its preferred option. ISFA agreed to consider the options for the evolution of the Liaison Group in the context of the 'Next Steps' process and provide initial feedback for consideration at the meeting of the 'Next Steps' Review Group. The NASCO Parties agreed to consider these options. The NGOs indicated that while it was for NASCO and ISFA to lead this initiative, the NGOs would wish to be involved in the process.

8. Election of Officers

- 8.1 Under its Constitution, the Liaison Group's Chairman may serve for a period of two years and is held alternately by representatives of NASCO and ISFA. The current Chairman, Mr Sebastian Belle, was appointed in 2009. The Group elected Mr Steinar Hermansen as its new Chairman. The Liaison Group recommends that its Constitution should be amended to allow for the election of a Vice-Chairman. On the assumption that this proposal is acceptable to NASCO and ISFA, the Group elected Professor Phil Thomas as its Vice-Chairman.

9. Any Other Business

- 9.1 The Liaison Group agreed that in future the origin of documents issued for its meetings should be indicated on the document.

9.2 There was no other business.

10. Report of the Meeting

10.1 The Liaison Group agreed the report of its meeting.

11. Close of the Meeting

11.1 The Liaison Group thanked Mr Belle for his excellent work in Chairing the Group since 2009. The Chairman thanked the participants for their contributions and closed the meeting.

List of Participants

Sebastian Belle (Chairman)	Maine Aquaculture Association, Hallowell, Maine, US
Mary Colligan	NOAA, NMFS, Gloucester, Massachusetts, US
Willie Cowan	Marine Scotland, Edinburgh, UK
Marco D'Ambrosio	European Commission, Brussels, Belgium
Brian Dornan	Scottish Government, Edinburgh, UK
Arne Eggereide	Directorate for Nature Management, Trondheim, Norway
Alan Gray	European Commission, Brussels, Belgium
Nell Halse	President of ISFA, Saint John, New Brunswick, Canada
Steinar Hermansen	Ministry of Environment, Oslo, Norway
Knut A. Hjelt	Norwegian Seafood Federation, Trondheim, Norway
Jens Christian Holm	Directorate of Fisheries, Bergen, Norway
Peter Hutchinson	NASCO, Edinburgh, UK
Scott Landsburgh	Scottish Salmon Producers Organisation, Perth, UK
Brian Meaney	Newfoundland & Labrador Department of Fisheries & Aquaculture, St John's, Canada
Pamela Parker	Atlantic Canada Fish Farmer's Association, Letang, New Brunswick, Canada
Ted Potter	CEFAS, Lowestoft, UK
Chris Poupard	Chairman of NASCO's NGOs, Truro, Cornwall, UK
Ruth Salmon	Canadian Aquaculture Industry Alliance, Ottawa, Ontario, Canada
Rory Saunders	NOAA, NMFS, Orono, Maine, US
Tim Sheehan	NOAA, NMFS, Woods Hole, Massachusetts, US
Jamey Smith	Fisheries and Oceans Canada, Ottawa, Ontario, Canada
Kevin Stringer	Fisheries and Oceans Canada, Ottawa, Ontario, Canada
Phil Thomas	Scottish Salmon Producers Organisation, Perth, UK
Boyce Thorne-Miller	Northwest Atlantic Marine Alliance, Maryland, US
Amy Williams	Fisheries and Oceans Canada, Ottawa, Ontario, Canada
Malcolm Windsor	NASCO, Edinburgh, UK

SLG(11)5

Meeting of the NASCO/North Atlantic Salmon Farming Industry Liaison Group

18 - 19 March 2011

Charles Shubert Room

Marriott Courtyard Boston Downtown, Tremont Street, Boston, USA

Agenda

1. Opening of the Meeting
2. Appointment of a Rapporteur
3. Adoption of the Agenda
4. Reporting arrangements on the BMP Guidance
5. Final Report of the Aquaculture and Related Activities Focus Area Review Group
6. Matters Arising since the last Liaison Group Meeting
 - (a) update on the Salmotrip project
 - (b) new research on the consequences of interbreeding between farmed and wild salmon
 - (c) development of standardised categories of escape events
 - (d) site selection and relocation criteria
 - (e) possible development of a Decision Tree to assist in applying the BMP Guidance
 - (f) research requirements relating to the management of the impacts of aquaculture on wild salmon stocks
 - (g) communications
7. Evolution of the Liaison Group
8. Election of Officers
9. Any Other Business
10. Report of the Meeting
11. Close of the Meeting

Report of the Meeting of the Ad Hoc Review Group on Aquaculture, Introductions and Transfers and Transgenics

Timothy Sheehan
&
Boyce Thorne Miller





Timeline Overview

- NASCO Annual Meeting – June 2009
 - Review Group formed and ToRs developed
- Review Group 1st Meeting – February 2010
 - Draft Report produced
- Liaison Group Meeting – April 2010
 - Draft Report presented
- NASCO Annual Meeting Special Session – June 2010
 - Draft Report presented
- Review Group 2nd Meeting – November 2010
 - Final Report produced
 - Incorporated comments from the Parties, ISFA and NGOs
- Liaison Group Meeting – March 2011
 - Present Final Report
- NASCO Annual Meeting Special Session – June 2011
 - Present Final Report



Review Group Terms of Reference

- Focus Area Reports (FARs)
 - Provide in-depth assessment of measures, as reflected in Implementation Plans, to implement NASCO Agreements (i.e. The Williamsburg Resolution)
 - Prepared by each Party/Jurisdiction
- Review and analyze the FARs on Aquaculture, Introductions and Transfers, and Transgenics
 - Do the steps in the FARs fully comply with NASCO's agreements to protect the wild stocks from genetic, disease, parasite and other impacts?
- Prepare a report which includes the following:
 - Identification of common challenges;
 - Identification of common management and scientific approaches to challenges;
 - Compilation of recommended best practice; and
 - Recommendations and/or feedback to help ensure implementation of the Williamsburg Resolution.



Review Group Members

- Torfinn Evensen
 - Heidi Hansen
 - Tim Sheehan
 - Bob Steinbock
 - Boyce Thorne Miller
 - Marita Rasmussen
-
- Brief biographies in **Annex 1**.



Best Management Practice (BMP)

- Adopted by both ISFA and NASCO (2009)
- Basic Principle
 - Salmon stocks in areas with farms should be as healthy as stocks in areas without farms
- Sea Lice
 - 100% of farms to have effective management so that there is no increase in lice loads or lice induced mortality of wild salmonids
- Containment
 - 100% of farmed fish to be retained in all production facilities
- BMP Guidance was intended to:
 - Assist NASCO Parties in framing the management of salmon aquaculture, in cooperation with their industries, and in developing future NASCO Implementation Plans and FARs in 2010
 - BMP Guidance was incorporated into FAR preparation guidance
- Review Group welcomed the BMP guidance and suggested it fulfilled their ToR of compiling best practice

Review and analysis of FARs

- Jurisdictions that didn't submitted a FAR (3)
 - Denmark in respect of Greenland, EU-Portugal, and **EU-Spain**
- Jurisdictions that did submitted a FAR (14)
 - Canada
 - Denmark in respect of the Faroe Islands
 - EU – Denmark
 - EU – Finland;
 - EU – France
 - EU – Germany
 - **EU – Ireland**
 - EU – Sweden
 - EU – UK (England and Wales)
 - EU – UK (Northern Ireland)
 - EU – UK (Scotland)
 - Norway
 - Russian Federation
 - USA



General Comments on the FARs

- *Structure and content*
 - Future FARs should focus on outcomes of measures taken to implement the Williamsburg Resolution as to demonstrate progress towards achieving the international goals
- *Action Plans on Containment*
 - Most FARs did not clearly identify the existence of an Action Plan(s) through which internationally agreed guidelines on containment would be implemented via existing or new voluntary codes of practice or regulations
- *International cooperation to minimize adverse impacts on wild stocks*
 - Better reporting of ongoing efforts encouraged



General Comments on the FARs cont'd

- *Salmon ranching*
 - No ranching presented being undertaken, but “*ranching to the rod*” needs to be categorised
- *Risk Assessments*
 - In general, impacts on the marine environment (particularly benthic impacts) or exposure of the site are considered, there appears to be little consideration of the health, genetic diversity and status of wild salmonid stocks
- *Transgenic salmonids*
 - Few FARs clearly described if controls exist to ensure future use is consistent with the NASCO Guideline
 - Given the possibility of commercial production of transgenic salmon, the Council should ensure thorough discussions on all the related issues and the guidance in The Williamsburg Resolution should be applied through out North America.



General Comments on the FARs cont'd

- *River Classification*
 - Few FARs referred to how river classification was used for developing management measures
- *Corrective measures*
 - Most FARs did not clearly report on the nature of the measures to be taken to protect wild stocks when unforeseen impacts are detected
- *Socio-economic information*
 - Most FARs did not provide a clear indication of how socio-economic factors are incorporated into management decisions



General Comments on the FARs cont'd

- *Evaluation of the effectiveness of measures taken*
 - Many of the FARs reported that measures taken are consistent with NASCO's agreements, but they did not describe if the measures are effective in safeguarding the wild stocks and achieving the international goals contained in the BMP Guidance
- *Research, Development and Data Collection*
 - A lack of scientific information should not be used as a reason for failing to take conservation measures and therefore further research and development on a number of topics is desired



General Comments Relating to the Assessments

- *Introduction*
 - Many FARs failed to provide information to demonstrate progress towards achieving the international goals for sea lice and containment
- *Scale of Activities*
 - Size matters, but low levels of salmon farming and poorly planned introductions/transfers have the potential for adversely affects
- *Responsibility for setting standards*
 - Suggest that government should set technical and environmental standards and oversee monitoring requirements and schedules



General Comments Relating to the Assessments cont'd

- *Containment*
 - Provided comments supporting the recommendations in the BMP Guidance and suggestions to help with future FAR reporting and assessment
- *Sea lice*
 - Provided comments supporting the recommendations in the BMP Guidance and suggestions to help with future FAR reporting and assessment
- *NGO Statements*
 - Report was unanimously agreed by the Review Group. NGO provided statements (**Annex 4**), that were not unanimously agreed upon by the Review Group



Feedback on Draft Report

- 5 Parties/Jurisdictions – **Annex 5**
- ISFA – **Annex 6**
 - NGOs response to ISFA – **Annex 7**
- 2010 Special Session
- All taken into account in finalizing report
 - Where appropriate, final assessment (**Annex 3**) were updated



Additional responses to Feedback

- *Template concerns*
 - Template was developed by the Council, not the Review Group, and combined the elements in the Williamsburg Resolution with those in the BMP Guidance
- *NGO circulation of FARs*
 - NGOs had circulated the FARs prior to the industry or jurisdictions seeing them
 - Review Group recommends consideration be given to making all FARs available online prior to review. To be considered by the 'Next Steps' Review Group



Response to feedback from the Jurisdictions

- Feedback carefully reviewed
- Feedback on new initiatives introduced subsequent to the submission of the FARs (i.e. during 2010), was not taken into account
- In some cases, assessments from the Draft Report were modified



Response to feedback from ISFA

- Feedback carefully reviewed
- Some new information presented that was not presented within the FARs submitted by the Parties/Jurisdictions
 - Assessments from Draft Report were not changed as the Review Group felt it was more appropriate for the Jurisdictions to consider the comments from the industry rather than the Review Group
- Heavy criticism of the process



Response to feedback from ISFA cont'd

- Review Group reiterated that the process used was developed by the Council and applied to all three previous FAR reviews
 - These were internal reviews intended to assess progress in implementing NASCO's agreements
- Council worked to keep ISFA informed and to allow for comments on both the Draft and Final Reports
- Suggestions for reformatting the report were incorporated



Response to feedback from ISFA cont'd

- Review Group reviewed any opinions expressed in the report to ensure they were justified
- Council's intention in conducting the review was to assess progress in implementing its agreements to conserve the wild salmon stocks and encourage sustainable salmon farming practices
 - Review Group's only concern was if NASCO Parties/Jurisdictions are implementing the NASCO agreements



Response to feedback from ISFA cont'd

- Review Group was confused by the statement that the international goals in the BMP Guidance are 'inherently unachievable and unrealistic'
 - BMP Guidance was adopted by NASCO and ISFA in 2009
- Review Group highlighted the progress made by the Liaison Group in recent years
 - Guidelines on Containment of Farmed Salmon
 - BMP Guidance
 - International goals for sea lice and containment.
- Review Group fully endorses the general principle outlined by the BMP Guidance
 - Salmon stocks in areas with farms should be as healthy as stocks in areas without farms



Identification of common challenges-approaches

- Intended to facilitate information exchange among Parties (**Annex 8**)
 - Point by point discussion of Williamsburg Resolution and the BMP Guidance, following the FAR reporting format, with overviews, assessments and examples taken from the FARs to highlight common challenges and approaches
- Includes recommendations on future reporting and approaches for improving information exchange



Next Steps

- Final Report presentation scheduled for
 - Liaison Group meeting (March 2011)
 - Council' Special Session (June 2011)

Annexes

- Annex 1
 - Biographies of the Members of the Review Group
- Annex 2
 - Terms of Reference and Working Methods
- Annex 3 (IP(10)33)
 - Assessments of the FARs
- Annex 4 (IP(10)32)
 - NGO Statements to the Review Group
- Annex 5 (IP(10)34)
 - Responses from Parties to the Review Group's Draft Report
- Annex 6 (CNL(10)33)
 - ISFA Comments on the Draft Report of Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group
- Annex 7 (CNL(10)37)
 - NGO Response to ISFA Comments on the NASCO Draft Aquaculture Focus Area Review Report
- Annex 8 (IP(10)36)
 - Comparative overview of approaches used to address challenges in minimizing the adverse impacts of salmon aquaculture, introductions and transfers and transgenics on wild salmon stocks

SLG(11)2

Progress Report on the Salmotrip Project

Background

1. The Williamsburg Resolution identifies the production of sterile fish as an area for research and pilot testing. It recognises that the methodology and techniques for sterilisation are now well developed and that research should focus on developing strains of sterile fish which could perform at a level similar to current strains of fish used in farm production. Furthermore, the Resolution recommends that trials should be encouraged to evaluate the performance of strains of sterile fish under production conditions. At the Liaison Group's Task Force meeting in 2009, a brief report was presented on the EU-funded Salmotrip project; an important project that seeks to examine many of the issues related to triploid salmon raised at the Liaison Group's 2005 Trondheim Workshop, 'Wild and Farmed Salmon – Working Together'. The project, which will be completed in June this year, focuses on five key areas at both experimental and commercial level: improvement in triploid yield and survival; provision of out-of-season smolts; the effects of family on performance; the causes and remediation of deformities; and the market perception of triploid salmon.
2. Information on the Salmotrip project was presented at the 2010 Liaison Group meeting (see document SLG(10)4 for details) and the NASCO Assistant Secretary was asked to continue to liaise with the project's coordinator so as to update the Liaison Group on progress. In this regard, it was noted that a session devoted to the Salmotrip project was to be held during the European Aquaculture Society (EAS) meeting in October 2010 when some preliminary results from the project would be presented. This paper provides a brief summary of the preliminary information presented at the EAS meeting, of publications arising from the project to date and of discussions with the coordinator and other scientists involved in the project. In other sessions at the EAS meeting, there were also presentations on the production of triploid cod, so there is increasing interest in this approach to reproductive containment of farmed fish.

Rationale for the Project

3. The use of triploid (sterile) salmon in aquaculture is not new and was originally tested in the early 1990s. In addition to addressing some of the concerns relating to the genetic and other impacts of farmed salmon on the wild salmon stocks, benefits to the farmer from the use of sterile salmon could include avoidance or reduction of sexual maturation and associated loss of condition and increased disease risk; increased grow-out period; wider harvest windows; reduced running costs as photoperiod regimes at sea would potentially not be needed; and protection for salmon breeding companies of their intellectual property rights on selected strains. It was noted at the Liaison Group's 2005 Trondheim Workshop, 'that there had been production issues associated with the use of triploid salmon which understandably were a concern to the industry. However, the increased scientific knowledge on triploid physiology being obtained through the Salmotrip project suggests that these problems may be associated *inter alia* with inappropriate protocols for rearing triploids. For example,

in previous studies triploids may have been derived from the tail end of the stripping season and poorer egg quality may have biased the assessment of triploid performance. Furthermore, triploids may smolt earlier than diploids and failure to treat triploids separately from diploids could result in poor seawater performance as reported from earlier studies.

4. The industry has also expressed concern that there may be consumer resistance to the use of triploid salmon and that there are welfare issues (such as increased incidence of deformities) that would need to be addressed. It was noted in the EAS presentation that more than 50% of oysters produced in France and a significant proportion of large (>1kg) farmed rainbow trout production is based on sterile triploids to alleviate pre-harvest maturation problems. Triploid carp are also being farmed. It was also noted that rearing of triploids could alleviate welfare issues associated with early maturation and decreased quality standards. As most salmon eggs used in farming now come from established breeding companies, it was suggested that it is important to assess triploidy with the other traits being improved and that the best possible families are identified. However, it was recognised that the use of triploid strains in the industry would be a radical change and would require a clear understanding of the environmental requirements of triploid fish, their performance on a commercial scale and consumer perception in order to determine if their use by the industry would be viable. The Salmotrip project is a full-scale feasibility study of the potential for the production of triploid salmon that will provide information to support decision-making regarding future aquaculture policies and the use of triploidy within the salmon industry.

Findings to date

Freshwater performance

5. As noted above, previous studies have indicated that triploid salmon show varying survival, growth performance and deformity prevalence compared to diploids. Lower triploid survival (up to 50%) during egg incubation has been reported but, as previously noted, this might be related to the use of lower quality eggs that may not withstand the triploid induction process. To examine this, Salmotrip scientists exposed eggs of varying quality to hydrostatic pressure using standardised protocols. Survival to hatching and first feed did not differ between diploids and triploids when recently ovulated eggs were used but for eggs that had entered the over-ripening period (7 – 10 days post-ovulation) there was a small reduction in diploid survival but 50% higher mortality in triploids compared to eggs of optimal quality. Survivors from over-ripe egg batches continued to show reduced performance during grow-out. These findings indicate that it is essential to use recently ovulated eggs when producing triploids.
6. In a series of nine experimental and field trials using different family lines reared in freshwater, the Salmotrip project, through collaboration with some of the industry's largest egg suppliers, has shown that triploids grew as well or significantly faster (more than 30% faster in some families) than diploids with minimal mortality and deformity to both S0 and S1 smolts. In one study, for which the findings have been published, while diploids were generally larger than triploids at hatching, this size difference was only maintained for six weeks post-first feeding with triploids

generally out-growing their diploid siblings by the end of the hatchery phase. Furthermore, there was no difference in the incidence of deformities between diploids and triploids which was low (<2%). Triploids also reached the smolt stage up to four weeks earlier than diploids. Failure to recognise these differences in smolt timing in the commercial environment could be the reason for the previously reported poor performance of triploids following transfer to sea water. The Salmotrip research has also demonstrated that triploid salmon smolts can be produced out-of-season, which is essential for ensuring year-round supply, using conventional photoperiod regimes.

Sea water performance

7. Studies of performance following transfer of smolts to sea water have been conducted in Norway, Scotland and France using both S1 and out-of-season S0 smolts in both commercial and research facilities. Some of the fish still remain to be harvested and the data assessed, but the results to date indicate that triploids grew at comparable, or in some families enhanced, rates to diploids although the prevalence of deformities was higher, particularly in the fastest growing triploid strains. Vertebral deformities were most commonly encountered while lower jaw deformities only occurred in one batch. The prevalence of shortened gill covers (operculae) was equal to or lower in triploids than the prevalence in diploids. It is important to note that the prevalence of deformities was lower than had been observed in previous studies and appears to be within commercially acceptable limits. However, in all commercial production batches, the prevalence of spinal deformities and cataracts was higher in triploids than in diploid fish. These deformities were mainly low level and not considered to be severe but where severe deformities did occur they were equally prevalent in triploids and diploids. It is important to note that the spinal deformities were in some cases only detectable by palpation (touch) or by x-ray and were not detectable by eye.
8. One study that has been published on the comparative seawater performance and deformity prevalence found that growth and survival in seawater were not significantly different between diploids and triploids but the incidence of external deformities, jaw malformation, was higher in triploids (~12%) than in diploids (<5%). Vertebral deformities were more prevalent only in the fastest growing triploids. The most significant detrimental effect of triploidy was on the rate and severity of cataracts.
9. The studies have shown that certain families appear to be more prone to deformity as triploids than others, suggesting that selection may be used to reduce the prevalence of triploids although the relationship to growth requires further study. Furthermore, it is thought that improvements in diet may be used to reduce both the occurrence of spinal deformities (high phosphorus diet) and cataracts (inclusion of histidine). This has been successfully achieved in diploid stocks within the last 6 – 7 years. However, to date all experimental and commercial trials using triploids have used conventional diploid diets. The project's coordinator considers that there is now compelling evidence to suggest that dietary deficiencies, particularly during the fast growth periods are a major cause of deformity occurrence in triploids and that triploid specific diets are required to address this problem.

Consumer perception of triploids

10. The objective of this part of the project is to consider consumer perception and valuation of triploid salmon, taking into account the risks and benefits as perceived by consumers. The attitudes of French, German and UK consumers to triploid salmon are being assessed through a large quantitative study focusing on perceived risks and benefits, information needs and information trust. The results to date indicate that little information is available and that knowledge levels are generally low. Attitudes towards genetic engineering are considered to be generally negative as are public perceptions of salmon farming in general, although triploid trout for sport fisheries are seen as quite positive. The results to date seem to favour a marketing strategy targeting consumers.

Summary

11. The Salmotrip project is a very important initiative focusing on the various concerns about the use of triploid salmon that were highlighted by the industry at the Trondheim Workshop. It appears from the findings to date, that the performance of triploids in freshwater is equal to or better than diploids of the same families, and in some cases markedly better. There is also evidence that this improved performance can be maintained in the sea, but an increased incidence of deformities (of the spine and cataracts) in triploids, albeit not severe, was again detected in these recent studies and will be a concern for the industry. However, the scientists involved in the Salmotrip project believe that through selection of optimal strains and attention to nutritional requirements these issues can be addressed, as has been the case with diploid stocks. They conclude that the potential for using triploid salmon looks promising. Further studies on performance, deformity and disease resistance will help to adapt rearing practices to the needs of triploid stocks to improve performance and welfare. It is hoped that one of the outputs from the project will be detailed protocols on rearing triploid salmon. If triploid Atlantic salmon are to be farmed commercially (as is the case, for example, for oysters and rainbow trout) they will need to be carefully marketed but the use of triploid salmon might be promoted as a measure to protect the wild stocks. As noted previously, the Salmotrip project has made enormous progress in addressing issues of relevance to the Liaison Group concerning the feasibility of using triploid salmon in aquaculture. The Group may wish to have a more comprehensive presentation when the data are published and it may wish to consider ways in which it could encourage and support further trials. Eventually the uptake of this technique may offer benefits to the salmon farmer and in the protection of the wild stocks.

Further reading

Fjelldal, P.G. and Hansen, T. (2010). Vertebral deformities in triploid Atlantic salmon (*Salmo salar* L.) under-yearling smolts. *Aquaculture*, 309: 131 – 136.

Leclercq, E., Taylor, J.F., Fison, D., Fjelldal, P.G., Diez-Padrisa, M., Hansen, T., and Migaud, H. (2011). Comparative seawater performance and deformity prevalence in out-of-season diploid and triploid Atlantic salmon (*Salmo salar*) post-smolts. *Comparative Biochemistry and Physiology, Part A*. 158: 116 – 125

Taylor, J.F., Leclercq, E., Preston A.C., Guy D., and Migaud, H. (2011). Parr-smolt transformation in out-of-season triploid Atlantic salmon (*Salmo salar* L.). *Aquaculture. In Press*.

Taylor, J., Migaud, H., Fjelldal, P.G., and Hansen, T. (2011). Sterile salmon: a potential means of reproductive containment. *Fish Farmer. In Press*.

Taylor, J.F., Preston A.C., Guy D., and Migaud, H. (2011). Ploidy effects on hatchery survival, deformities and performance in Atlantic salmon (*Salmo salar*). *Aquaculture. In Press*

SLG(11)4

FOR DISCUSSION PURPOSES ONLY

Proposal For Reconstitution Of The ISFA-NASCO Liaison Group To Become The Collaborative Working Group On Aquaculture-Wild Salmon Interactions

The **ISFA-NASCO Task Force on Best Practice in Aquaculture to Address Impacts on Wild Salmon Stocks** has recently developed ***Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks***. This work represents a successful collaboration of NASCO government party representatives, the aquaculture industry, scientists, and salmon conservation groups to achieve specific terms of reference. It was completed through two face-to-face meetings and e-mail correspondence over a period of about one year. This clearly demonstrates how these groups can work constructively together given commonly understood goals and objectives.

The **ISFA-NASCO Liaison Group** officially comprises representatives of NASCO government parties and the aquaculture industry, and in the case of the above-noted work is serving to ratify the work of the Task Force. This ratification will be a significant accomplishment of the Liaison Group in recent years. Previous work includes development of Guidelines for Containment of Farmed Salmon (2001) and a one-day workshop entitled "Wild and Farmed Salmon - Working Together" (2005).

We propose that parties build on the momentum from the success of the Task Force and the resulting Guidance on Best Management Practices to clearly focus collaboration to address interactions between aquaculture and wild salmon stocks. We propose that the Liaison Group be reconstituted into a group with similar membership to the Task Force. The mandate of this group would be to support implementation of the Guidance on Best Management Practices by the NASCO parties through a process of information exchange and coordination of monitoring, research and development.

Should parties be agreeable to this proposal, Canada would be pleased to lead development of the Terms of Reference for this group. The composition of this group will be a key aspect of its success. The collaborative nature of the group requires that the group be comprised of an equal number (4 or 5) of party representatives, aquaculture industry, and conservation groups. Individuals on the group would have an expertise in aquaculture and farmed-wild interactions, and would work together to fulfill the mandate. The Chair of the group would rotate annually. Canada offers to provide the first Chair.

This Collaborative Working Group on Aquaculture-Wild Salmon Interactions would be established based on the following:

- NASCO is an international body established in 1984 with the objective to contribute through consultation and co-operation to the conservation, restoration, enhancement and rational management of Atlantic salmon stocks in the North Atlantic Ocean, taking into account the best scientific evidence available to it. Due to the migratory nature of Atlantic salmon, rational management of this resource can only be achieved through

international cooperation. There are many pressures on the resource where international cooperation has proven to be valuable.

- In 2000, an advisory group was established to provide an international forum for liaison between the salmon farming industry in the North Atlantic and the relevant authorities responsible for wild Atlantic salmon and aquaculture on issues of mutual interest and to make recommendations for action. The Liaison Group has developed Guiding Principles for its work as well as Guidelines on Containment of Farm Salmon. In 2001 the Liaison Group established a Salmon Co-operation Group which undertook a project (the SALCOOP project) to review existing cooperative ventures between wild and farmed salmon interests, to identify further areas for cooperation, and to examine options for securing funding for cooperative projects. In 2005, the Liaison Group held a one-day Workshop entitled "Wild and Farmed Salmon - Working Together".
- A significant milestone of NASCO was, in 2003 with subsequent amendments, 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). This resolution has provided a solid basis for NASCO, its members, and the Liaison Group to address interactions between wild and farmed salmon.
- In 2009 the Liaison Group established a Task Force to provide advice on best practices in aquaculture to address impacts on wild salmon stocks. Having noted the existing Codes of Practice and legislation regarding management of impacts of salmon farming on the wild salmon stocks, it was the view of the Task Force that the Williamsburg Resolution remains valid but it needs to be strengthened in its interpretation and application, particularly in terms of defined goals and assessment of outcomes. The Task Force subsequently developed *Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks*. This work represents a successful collaboration of NASCO government party representatives, the aquaculture industry, scientists, and salmon conservation groups to achieve a specific terms of reference.
- The Task Force discussed many aspects related to implementation of the BMP Guidance. It was recognized that assessment of progress towards achievement of the international goals through reporting and tracking is a key element of the BMP Guidance but that there is a need to avoid an excessive reporting burden. It was also recognized that implementation of the BMP Guidance would be facilitated by collaborative information exchange regarding monitoring and research and development. More specifically, the Task Force recognized that implementation of the BMP Guidance would be supported by further efforts that would:
 - Provide a broad base for discussion of the various aspects of implementation;
 - Facilitate sharing of information between members; and,
 - Assist the Parties of NASCO in the development and implementation of appropriate monitoring, regulatory, and management programs applicable to sea lice and containment.

- As highlighted by the Task Force in the development of the BMP Guidance, there are specific areas of focus that must be considered to facilitate implementation. These include:
 - Research and development;
 - Monitoring programs;
 - Management and regulatory programs, including government approvals of farm practices and procedures;
 - Reporting within Parties and to NASCO.

In its Draft Report, the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group, the Review Group welcomed the BMP Guidance.

Attachment 1



INTERNATIONAL **SALMON** FARMERS ASSOCIATION

March 21, 2011

Malcolm Windsor, Secretary
NASCO
11 Rutland Square
Edinburgh
EH1 2AS UK

Dear Malcolm:

On behalf of the International Salmon Farmers Association (ISFA) and its member organizations, we welcome the opportunity to provide the following comments on the proposals that were considered and discussed during the March 18-19, 2011 Liaison meeting regarding the evolution of the NASCO / ISFA group and regarding NASCO's Next Steps process.

- The International Salmon Farmers Association (ISFA) values the liaison that the Salmon Farming industry has maintained with the Parties of NASCO since 1999.
- ISFA remains committed to the Guiding Principles for Cooperation between NASCO and its Contracting Parties and the North Atlantic Salmon Farming Industry SLG(01)11.
- ISFA looks forward to the outcome of the NASCO 'Next Steps' process and welcomes recommendations from and direct discussions with the Parties regarding the future scope and structure of the Liaison Group.
- ISFA members share a vested interest in and contribute to the conservation of wild salmon.
- ISFA expects the Parties to engage their respective ISFA members in the development of their Delegation policies and positions regarding salmon.
- ISFA welcomes the offer to engage directly with the Parties through a seat at the NASCO Annual Meeting consistent with that afforded to the NGOs.

I trust these comments will be useful as you enter the second day of your deliberations and look forward to further discussions.

Yours truly,
Nell Halse, President
(via email)

cc: Liaison representatives from the North Atlantic Parties present at the 2011 Liaison meeting (UK, EU, Canada, US, Norway) and ISFA members

CNL(11)16

Salmon Fishery at St Pierre and Miqueon



PREMIER MINISTRE

**Secrétariat
Général de la Mer**

Le Secrétaire général adjointe

Paris, le 18 mai 2011

N° 110 1/SGMER

Affaire suivie par Marie-Sophie DUFAU-RICHET
01 42 75 66 53
marie-sophie.dufau-richet@pm.gouv.fr

Note
To

President of NASCO

Objet : Report for France in respect of saint-Pierre et Miquelon, season 2010.

In preparation for the next annual meeting of NASCO (Greenland, 4-6 June), the French authorities are pleased to confirm you that they have send by email of the 17th of may addressed to the secretariat the report for France in respect of St Pierre et Miquelon concerning the 2010 season, including :

- administrative information provided by the Pôle maritime (DTAM²) in Saint-Pierre et Miquelon
- scientific information provided by the Ifremer³ representative in Saint-Pierre, with genetic analyses by Genindexe

² Direction of territories, Food and Sea

³ French Research Institute for the Exploration of the Sea

In 2010, 9 professional and 57 recreational licenses were allocated. The campaign was rather short, and catches amounted to 2.78 metric tons: 0.68 lower compared to 2009. The share of recreational fishing in the total catches increased in 2010.

As we informed NASCO, delegates and observers last year, the sampling programme has been resumed. Sampling time allowed for some communication with fishermen on the conservation of breeding individuals. The scientific studies will be continued in 2011, and Ifremer plans to increase the size of the sample. Moreover, a workshop should be organized in 2011 – 2012 between French and Canadian scientists on salmon ageing, opening the way for more information on the age structure of the salmon population harvested in the French territorial waters. Last, human resources have been allocated for further freshwater studies in the fall of 2011.

Thus, France in respect of Saint-Pierre et Miquelon wishes to maintain its observer status in NASCO North American Commission and to develop scientific cooperation with your organization, keeping in mind that salmon fishing is a traditional, seasonal activity for this collectivity. Fish is mostly used for consumption in the family circle, and complements the income of a few professionals. Although the number of licenses is expected to remain relatively stable in the near future (in 2011, 9 professional and 58 recreational licenses have been allocated), fishing effort is likely to be lower as the increase of fuel price should act as a deterrent.

I wish you a successful meeting in Ilulissat.

Le Secrétaire général adjoint

Bruno PAULMIER



PREFECT OF SAINT PIERRE AND MIQUELON

Department for Territories, Food and the Sea **Saint-Pierre, 26 April 2011**

Maritime Centre

Head of the St Pierre and Miquelon Maritime
Centre

To

The Director of Maritime Fisheries and
Aquaculture
3 Place Fontenoy
75007 Paris

Our Reference: No. 75/PM/2011

Person responsible: Phillipe Museux
SAM-975@developpement-durable.gouv.fr
Tel: 05 08 41 15.30 – Fax: 05 08 41 48 34

RE: Report on the 2010 Salmon Fishery

Annual report on the Atlantic Salmon Fishery at Saint Pierre and Miquelon 2010 Season

1. Legislation

Salmon fishing in the St Pierre and Miquelon archipelago is regulated by decree No 87-182 of 19 March 1987, implemented under the Order of 20 March 1987.

This legislation establishes the following:

- The fishery is under license and subject to an Annual Fishery Plan
- The minimum capture size is 48cm
- Nets must be declared and marked
- The minimum mesh size is 125mm
- The fishery season is restricted to 1 May – 31 July
- It is not permissible to place fishing gear within 300m of a river mouth.
- Restricted fishing effort:
 - 3 x 360m nets for professional fishermen
 - 1 x 180m net for recreational fishermen
 - All catch must be declared (through annual declarations and a fishing log)

2. Permit allocation

Fishing permits are allocated to professional fishermen (who may sell their catch) and recreational fishermen (who are not authorised to sell their catch).

The allocation procedure is based on fishery precedence and on respect for the obligation to declare catch throughout the previous year.

The Department for Maritime Affairs deals with permit applications and allocates each permit holder with a specific site to fish for the entire season. This fishery site plan is published by Order of the Prefect.

In 2010, 9 professional permits were issued (8 in 2009) and 57 recreational permits were issued (50 in 2009). The total number of permits has increased compared to the previous two years (64 in 2008, 58 in 2009 and 66 in 2010).

3. Salmon Catch

The total 2010 catch stands at:

Professional catch: 205 salmon caught weighing 1002kg (1864kg in 2009).

Recreational catch: 1780kg (1600kg in 2009). 768 salmon were caught, compared to 819 in 2006, 470 in 2007, 933 in 2008 and 748 in 2009.

748 salmon were caught (819 in 2006, 470 in 2007 and 933 in 2008)

The total weight of the catch was 2782kg (3464kg in 2009 and 3450kg in 2008) and fishing effort remains low.

The 768 salmon caught by 57 recreational boats averages around 14 salmon per recreational fisherman. It should also be noted that many boats only fish for a very short period and bring their nets in well before the end of the permitted season, as their catch is sufficient for them and their immediate circle.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Professional Fishery										
No. of licenses	10	12	12	13	14	13	13	9	8	9
Catch volume	1544	1223	1620	1499	2243	1730	970	1604	1864	1002
Recreational Fishery										
No. of licenses	42	42	42	42	52	52	53	55	50	57
Catch Volume	611	729	1272	1285	1044	1825	1062	1846	1600	1780
Total catch	2155	1952	2892	2784	3287	3855	2032	3450	3464	2782

There is no export of salmon and all salmon caught are consumed on the local market. Most salmon caught are retained for personal consumption, while only a few are sold to restaurants or individuals through a local fishmonger.

It should be noted that there is no fishing for salmon in the archipelago's rivers.

Report on the biological observations made on the Atlantic salmon (*Salmo salar*) catch during the 2010 fishery at St Pierre & Miquelon



Contents

Introduction

1 – Legislation

2 – Permit allocation

3 – The location of fishing sites

4 – Fishing gear

5 – Sampling of the 2010 landings

6 – Salmon catch in 2010

7 – Water temperature

8 – Genetic study

9 – Scale study

10 – Parasite study

Conclusion

Cover photo: Salmon biometry

(copyright: Ifremer Herlé Goraguer)

Introduction:

Sampling of the Atlantic salmon catch at St Pierre & Miquelon re-commenced in 2010, in response to a request from the Délégation Générale à l’Outre-Mer, and in order to provide NASCO with recent information on the catch at St Pierre & Miquelon. Sampling had been suspended during 2009 due to the absence of an IFREMER agent.

The sampling carried out by IFREMER enables biometric monitoring to be undertaken, the weight and length of the fish to be recorded and tissue samples to be taken in order to determine the origin of the catch. Scale samples are also taken in order to determine the age of the fish.

I – Legislation

The salmon fishery at St Pierre & Miquelon is operated under the management and fish resource conservation measures which are contained in the Order of 20 March 1987, implemented under the decree No 87 – 182 of March 1987.

Article 11. Fishing for Atlantic salmon (*Salmo salar*) in the archipelago’s waters is forbidden each year between 1 January and 30 April, and from 1 August to 31 December.

With regard to the location of fishing sites, priority will be given to professional fishermen who will be granted 2 sites per boat. One site per recreational fishing boat will be granted.

Where there is competition between two or more fishermen for one site, the Head of the St Pierre & Miquelon Maritime Affairs Office will draw lots. The draw will be held in the presence of the interested parties. The competing parties will then fish the site in rotation.

Article 12. The total length of authorised salmon fishing nets will not exceed one thousand and eighty metres for professional fishermen and one hundred and eighty metres for recreational fishermen.

Each individual net for use by professional fishermen will not exceed three hundred and sixty metres.

It is forbidden to place any part of a net within 360m of the mouth of any water-course in which salmon may spawn (Belle Rivière, Dolisie), or within 200m of any part of another net.

Where a net becomes displaced, the permit holder has 48 hours to reposition the net correctly. Nets must not be left unattended during a period of 5 consecutive days.

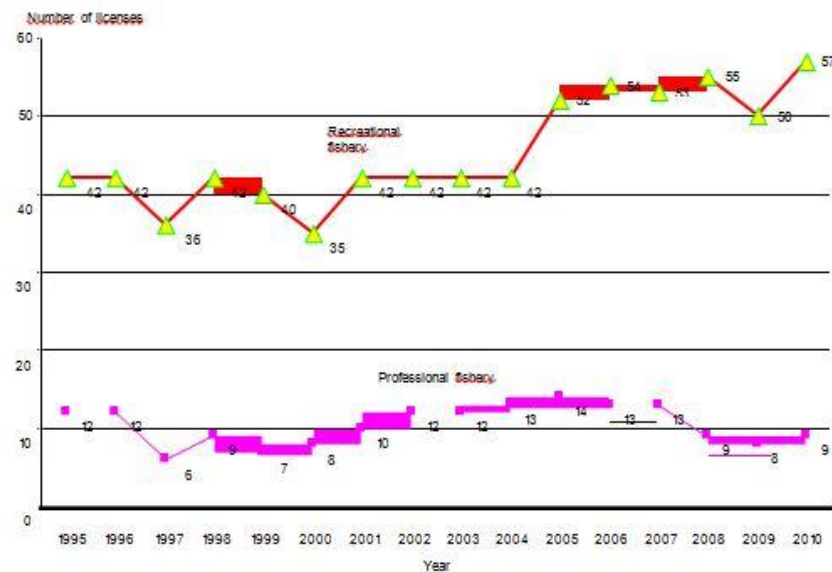
Article 13. Salmon fishermen must register their catch on their fishing log immediately after bringing said catch on board their boat.

This fishing log must be made available on request and should be sent to the Maritime Affairs Office before 1 September each year.

2 – Permit Allocation

In 2010, 9 professional permits were allocated, which is one more than in 2009. 57 recreational permits were issued in 2010, which is an increase from 2009. Figure 1 below shows the changes in permit allocation for both types of fishing since 1995

Fig 1- The number of Atlantic salmon fishing permits issued between 1995 and 2010 at St Pierre & Miquelon. Source : Maritime Affairs, Saint -Pierre



It should be noted that despite the increase in the total number of permits issued since 2007, fishing effort taken as the maximum authorised length of nets has fallen by 15.5% between 2007 and 2010 (23,580m in 2007 compared to 19,980m in 2010). This is essentially due to the fact that fewer professionals with the right to place 1080m of net are fishing, and the limit of 180m of net for recreational fishermen.

3 – The location of fishing sites

The majority of fishing sites are located close to the island of St Pierre, to the South-East of the island and are mainly used by recreational fishermen.

Nets may be placed at the following sites:

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 Grappins, 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 (see Annex 1 for a map of the main fishing areas around the Archipelago).

4 – Fishing gear

The fishing gear used generally consists of 3 or 4 nets joined together. Made in Canada, they are tied with a 60/100mm diameter polyamide monofilament thread. The thread is bottle-green in colour for nets with a stretched mesh size of 5 inches (125mm). It should be noted that all the nets used cannot be strictly identical.

The maximum authorised net length is 3 x 360m for professionals and 180m for recreational fishermen.

5– Sampling of the 2010 landings

Sampling was possible on 9 occasions during the fishing season from the beginning of June to mid July.

A total of 57 gutted salmon were measured and weighed according to protocol.

Adipose fin samples were taken for genetic analysis, and scale samples were taken in order to determine the age of 51 individual fish.

Mr Phillipe Gueguen, from the Coastal Unit of Maritime Affairs was present at two of the samplings, between 0600 and 0800hrs, when the boats arrive and depart. Otherwise, sampling was usually carried out by local fishmongers who inform IFREMER as soon as 10 or more salmon are supplied to the establishment.

	2003	2004	2005	2006	2007	2008	2009	2010
Number of Samplings	12	11	8	19	1	2	None	9
Date of the first sampling	04 June	05 June	06 June	06 June	14 June	09 June		10 June
Date of the last sampling	06 July	29 June	23 June	04 July	14 June	16 June		07 July
Total weight sampled(kg)	872	837	718	926	49	218		163
Number sampled	340	355	310	391	12	68		57
Number weighed	340	355	310	391	12	68		57

Table 1 – Sampling operations carried out at St Pierre & Miquelon between 2003 and 2010.

6 – Salmon catch in 2010

According to the catch declared to Maritime Affairs in 2010, total catch stands at 2,780kg of whole fish, a decrease of 680kg compared to 2009. The conversion ration used to obtain the gross weight figure is 1:1.5.

Professional catch accounts for 36%, and recreational catch 64%, of the total catch.

In 2009, professional catch accounted for 54% and recreational catch 46% of the total catch.

Figure 2 shows the landings by fishing type since 1990, and figure 3 shows the total accumulated weight.

Fig 2- Atlantic salmon catch between 1990 and 2010 at St Pierre & Miquelon. Source : Maritime Affairs, Saint-Pierre

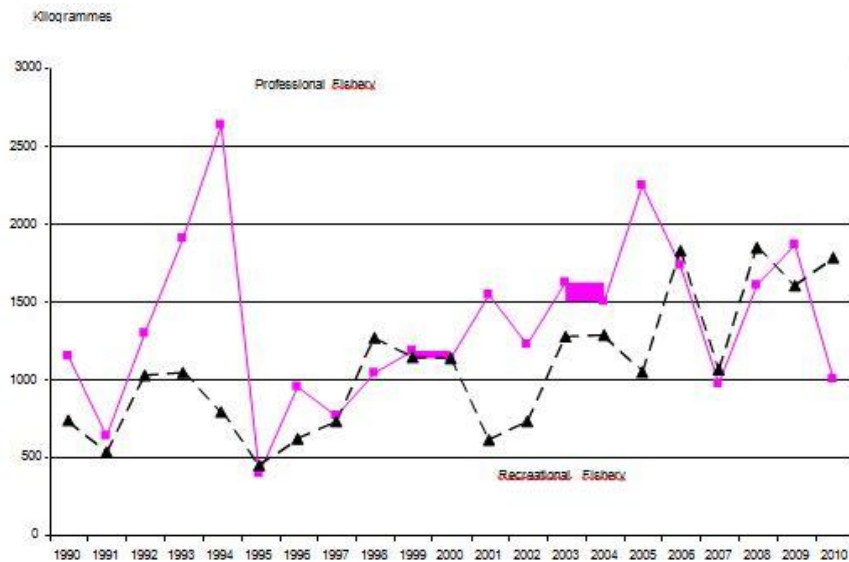
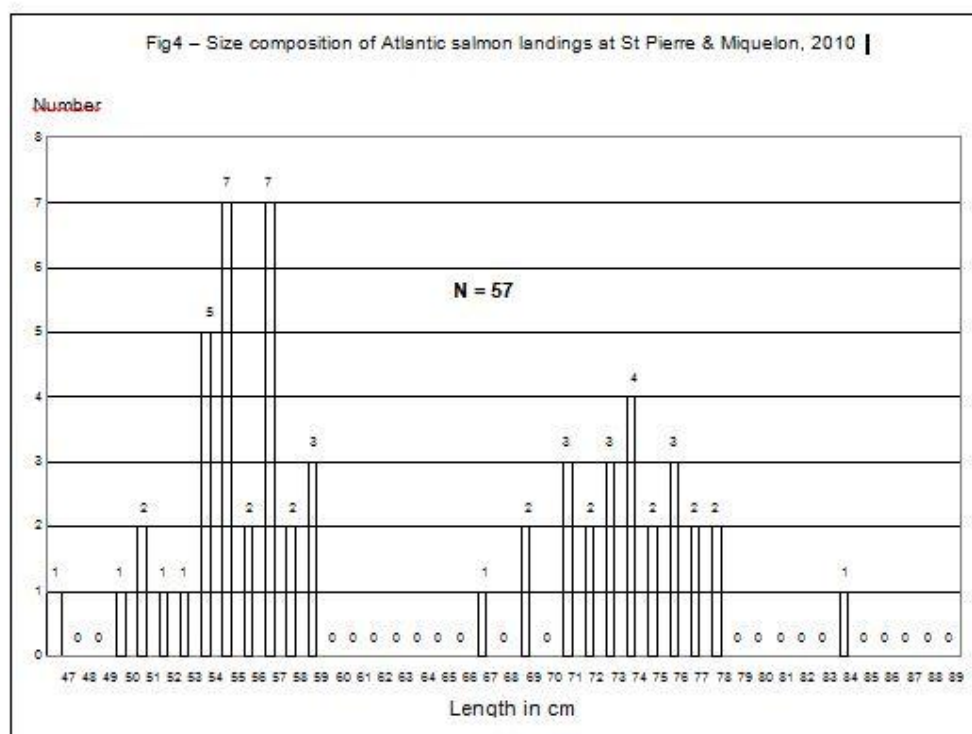
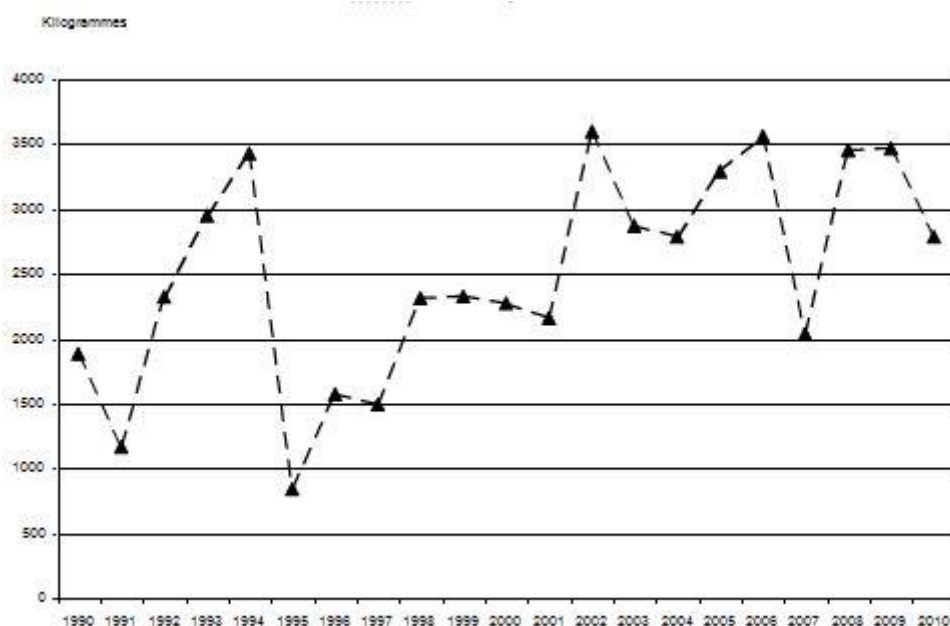


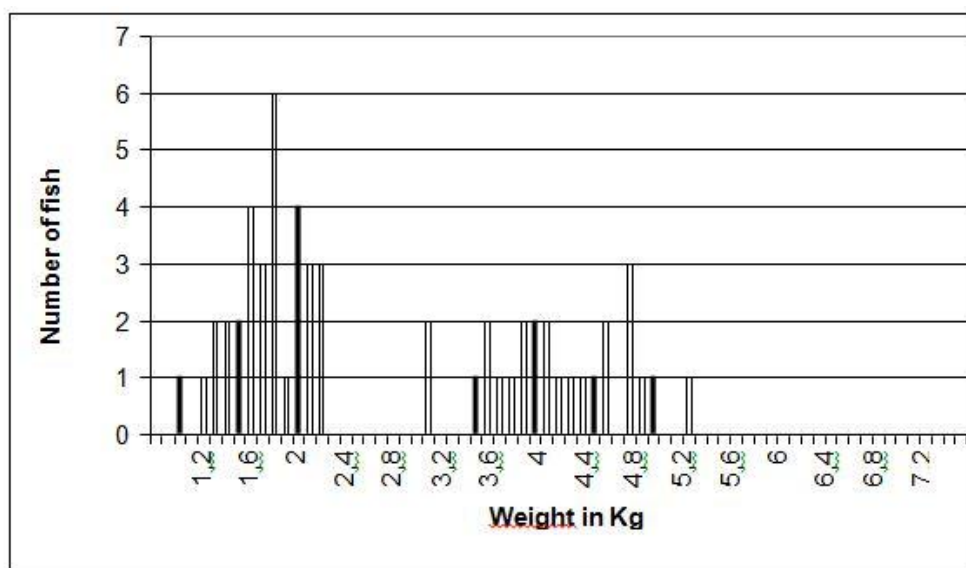
Photo 2 : Measuring salmon in the workshop (copyright: Ifremer)

Fig 3- Accumulated Atlantic salmon catch at St Pierre & Miquelon between 1990 and 2010. Source : Maritime Affairs, Saint-Pierre



The average size is 63cm. The smallest size observed was 47cm and the largest was 84cm.

Figure 5- Weight composition of the 2010 landings



The average weight is 2,680g (gutted weight), the minimum weight observed was 1,080g and the maximum was 5,390g.

7 – Water Temperature

As the office did not have the correct equipment during the sampling period, water temperature data was not recorded.

However, an approximation can be made by looking at the data continually recorded at a station in Miquelon harbour. The temperatures recorded there in 2010 were similar to those recorded in previous years.

8 – Genetic study

51 adipose fin samples were taken from the salmon sampled in 2010 for genetic identification using their DNA imprint. Comparing the profiles using a genetic database allows the origin of each fish to be determined. This work was carried out by the Genindexe Laboratory in La Rochelle (the full results of the analysis are contained in Annex 2).

3 profiles (or 6%) indicated US origin, while the other 48 profiles (94%) identified indicated Canadian origin.

A previous genetic study of 25 fish, carried out in 2004, showed that the salmon sampled at that time were mainly of Canadian origin.

9 – Scale Study

51 scale samples were taken in order to determine the age composition of the salmon. These samples were sent to IFREMER's National Sclerochronology Centre in Boulogne sur Mer which will carry out the analysis. The results are not yet available at the time of writing. Collaboration with a DFO laboratory in Canada is planned in order to best determine the age of the sampled salmon.

10–Parasite study

3 of the 51 fish sampled displayed ectoparasitosis. The parasite is likely to be the sea louse, an external copepod parasite, potentially the *Lepeophtheirus salmonis* species (see photo below).



Photo 3: A salmon with ectoparasites (Copyright : Ifremer Herlé Goraguer)

11– Conclusion

Despite potentially lasting 3 months, the 2010 fishing season was much shorter. In fact, many recreational fishermen wait for catches to begin before placing their nets in the water, as fishing requires a significant financial investment, especially in fuel. It is therefore possible that, as they would say, “the big fish have already gone past” when they place their nets.

Most fishermen had removed their nets by the beginning of July as they were no longer making any significant catch. This fishing season was considered to be poor.

The genetic study shows that all the salmon sampled were of North American origin and the majority were of Canadian origin.

SALMON FISHING AREAS SAINT-PIERRE AND MIQUELON



Annex 1: Location of the main fishing areas in St Pierre and Miquelon during the 2010 season.

Annex 2: Report of the Laboratoire d'Analyses Genetiques Genindexe Analysis

ANALYSIS REPORT

Description of the Request

Date of receipt: October 2010

Nature of Sample: 51 *Salmo salar* adipose fin samples

Test requested: Genetic identification by DNA imprint and comparison to genetic database for population assignation.

GENINDEXE
6, rue des Sports
17000 La Rochelle

Téléphone : 33(0)5 46 30 69 66
Fax : 33(0)5 46 30 69 68
E-mail : contact@genindexe.com
<http://www.genindexe.com>

Methodology

The samples were received in the laboratory.

Each sample was identified using a unique internal code between SSA2663 and SSA2713 (individuals referenced from 01 to 51).

The genetic material for each individual was then extracted and purified according to the laboratory's current methods.

The genetic profiles of the individuals were created using the following SALSEA microsatellite markers:

- Ssa14
- Ssa197
- Ssa202
- Ssa289
- SsaD144
- SsaD157
- SsaD486
- SsaF43
- Sssp1605
- Sssp2201
- Sssp2210
- Sssp2213
- Sssp2215
- SsspG7
- SsosL85

In each series of genetic amplification, the following controls were introduced in addition to the DNA extracts from the individuals to be analysed:

- Negative PCR control (blank PCR)
- Extraction control
- Positive PCR control (DNA taken from an individual whose genotype is known and has been standardised)

The profiles obtained will be compared to those in the database in order to assign the population. The profiles will be compared to the following populations:

USA: Maine, Narraguagus

USA: Maine, Penobscot

Canada: New Brunswick, Tobique

Canada: Quebec, Ste Marguerite
Canada: Quebec, Ste Anne
Canada: Quebec, Malbaie
Iceland: Sudurland, Nupsa
Iceland: Vesturland, Langa
Iceland: Nordurland, Laxa i Adaldal
Scotland: R Don
Scotland: R Almond
Scotland: Coulin
England: R Dart
Wales: R Dee
France: Allier
France: Sée
Russia: Neva
Russia: Ponoï
Russia: Pulonga
Finland: Varzuga
Finland: Simojoki
Finland: Tornionjoki
Norway: Komag
Norway: Repparfjord
Norway: Figgjo
Norway: Pechora
Norway: Saltdalselva
Sweden: Atran
Denmark: Skejrn
Spain: R Stella
Spain: R Narcea
Ireland: Boyne
Ireland: Blackwater
Ireland: Dawros

Results of the Analyses

The samples were genotyped according to 16 markers. The positive control showed a complete and true profile. The negative controls gave no signals.

The profiles obtained are shown in Table 1 below.

	Ssa14	Ssa14	Ssa171	Ssa171	Ssa197	Ssa197	Ssa202	Ssa202	Ssa289	Ssa289	SsaD144	SsaD144	SsaD157	SsaD157	SsaD486	SsaD486	SsaF43	SsaF43	SSsp1605	SSsp1605	SSsp2201	SSsp2201	SSsp2210	SSsp2210	SSspG7	SSspG7	Ssosl85	Ssosl85	SSsp2213	SSsp2213	SSsp2215	SSsp2215
SSA-2663	145	145	240	240	0	0	0	0	0	0	225	233	330	354	0	0	127	127	0	0	304	352	112	112	0	0	199	199	186	190	163	175
SSA-2664	141	141	252	252	167	207	302	302	118	118	181	237	346	362	175	187	111	131	252	252	280	280	112	116	191	199	195	195	194	198	171	175
SSA-2665	145	145	256	268	175	215	278	294	118	118	213	261	374	398	171	175	117	123	234	238	284	284	112	112	183	191	191	193	202	202	163	167
SSA-2666	145	145	228	264	171	171	294	310	118	118	181	205	378	378	175	187	117	127	234	238	276	328	132	160	175	187	179	191	154	206	163	167
SSA-2667	141	145	246	254	171	171	270	282	118	118	181	217	350	358	171	187	127	127	234	258	300	324	112	112	227	227	181	191	194	198	133	175
SSA-2668	145	145	244	260	167	179	302	318	118	118	0	0	378	394	171	175	0	0	242	246	0	0	112	132	199	203	0	0	0	0	163	163
SSA-2669	145	145	250	266	183	187	294	306	118	118	161	225	370	382	187	191	117	117	238	258	276	316	112	124	179	191	191	195	162	194	167	167
SSA-2670	145	145	246	258	171	175	286	298	118	124	217	257	358	386	171	171	123	135	234	238	312	336	112	124	127	219	195	201	182	210	159	163
SSA-2671	145	147	218	248	167	175	282	306	118	118	161	233	330	338	171	199	107	117	238	246	356	360	112	112	187	191	179	199	186	210	171	175
SSA-2672	141	145	242	246	179	191	278	278	118	124	185	193	378	398	171	175	105	117	246	246	304	312	112	120	183	199	187	191	182	182	159	163
SSA-2673	141	145	224	246	171	179	262	278	118	118	221	257	334	354	187	195	117	117	258	258	316	316	112	120	191	215	179	185	190	206	159	159
SSA-2674	141	145	236	248	171	171	274	302	118	122	213	221	366	366	171	187	117	127	230	234	312	320	112	132	175	195	179	197	190	190	155	175
SSA-2675	0	0	0	0	0	0	0	0	0	0	181	201	0	0	0	0	117	143	0	0	292	328	0	0	0	0	195	195	194	194	0	0
SSA-2676	141	145	230	254	163	175	290	306	118	122	0	0	334	426	187	191	117	117	230	246	0	0	124	124	179	183	181	191	194	194	159	159
SSA-2677	141	145	242	258	167	179	274	302	118	118	209	221	358	410	171	179	117	127	230	230	288	312	136	136	183	203	185	191	170	202	163	167
SSA-2678	141	145	224	268	175	179	306	310	118	118	209	209	370	406	171	195	117	143	230	238	324	376	124	132	183	191	195	197	194	214	147	167
SSA-2679	145	145	266	278	171	171	278	290	118	118	197	241	338	370	171	183	117	117	230	238	288	320	112	112	167	167	181	191	178	198	163	187
SSA-2680	141	145	234	242	191	195	278	286	118	118	185	209	350	382	175	191	117	117	230	238	332	332	112	132	195	199	181	185	190	194	151	187
SSA-2681	141	141	224	260	179	219	298	310	118	122	125	181	386	398	171	199	117	131	230	246	292	364	112	132	179	199	191	195	194	202	117	187
SSA-2682	141	145	234	244	167	179	294	298	118	118	209	229	362	398	171	171	117	123	230	246	284	324	112	112	195	195	181	191	174	186	163	175
SSA-2683	141	141	248	248	171	175	282	310	118	118	201	201	350	402	175	195	117	127	234	234	300	336	112	152	135	135	179	195	170	198	147	167
SSA-2684	145	145	230	234	183	183	298	310	118	124	217	249	342	358	171	171	117	117	234	258	288	336	132	136	175	187	179	187	170	190	151	179
SSA-2685	141	145	238	238	171	171	286	314	118	118	185	257	386	414	175	175	117	117	234	238	308	328	112	112	167	179	183	187	194	198	171	187
SSA-2686	145	145	234	270	163	207	294	310	124	124	205	209	342	354	171	171	127	127	242	246	344	344	112	136	187	191	179	185	174	190	163	163
SSA-2687	141	141	242	242	179	183	306	310	118	118	193	205	0	0	175	191	111	117	234	234	284	316	112	136	179	179	197	203	182	190	163	179
SSA-2688	141	145	230	234	183	199	250	282	118	118	221	237	346	374	175	175	117	127	230	246	304	308	112	136	183	211	181	195	178	190	141	151

	Ssa14	Ssa14	Ssa171	Ssa171	Ssa197	Ssa197	Ssa202	Ssa202	Ssa289	Ssa289	SsaD144	SsaD144	SsaD157	SsaD157	SsaD486	SsaD486	SsaF43	SsaF43	SSsp1605	SSsp1605	SSsp2201	SSsp2201	SSsp2210	SSsp2210	SSspG7	SSspG7	SsosL85	SsosL85	SSsp2213	SSsp2213	SSsp2215	SSsp2215
SSA-2689	141	141	242	254	171	175	306	310	118	118	193	257	330	346	171	175	117	117	234	238	316	336	112	136	175	175	181	191	182	186	163	175
SSA-2690	145	145	236	238	171	183	294	306	118	118	185	201	354	362	179	195	117	127	230	234	280	332	112	136	179	203	193	199	190	198	159	171
SSA-2691	141	145	240	242	183	195	250	282	118	118	193	225	382	382	171	175	117	127	238	246	288	304	112	112	175	187	185	195	198	210	171	179
SSA-2692	0	0	0	0	171	187	310	310	118	118	197	257	0	0	171	175	117	127	0	0	308	324	0	0	175	203	179	179	148	148	0	0
SSA-2693	141	141	240	254	171	171	286	314	118	118	185	205	374	390	175	175	127	129	234	238	320	278	112	132	167	179	193	203	170	170	155	167
SSA-2694	141	145	224	234	163	207	294	310	124	124	201	201	366	382	171	171	117	117	242	246	320	324	124	136	187	191	181	195	194	194	159	187
SSA-2695	145	145	240	242	0	0	0	0	0	0	217	217	386	386	0	0	117	131	0	0	336	372	128	136	0	0	179	179	162	162	163	163
SSA-2696	145	145	232	240	183	199	250	250	118	118	193	217	350	358	175	175	117	129	230	246	276	356	112	128	183	211	179	191	178	182	159	175
SSA-2697	141	145	244	250	171	175	282	306	118	118	165	205	370	370	171	175	117	117	234	238	300	344	112	112	175	175	179	199	170	190	167	167
SSA-2698	141	145	232	244	171	183	294	306	118	118	185	205	362	378	179	195	117	123	230	234	288	296	112	112	179	203	195	197	162	186	155	155
SSA-2699	145	145	254	260	183	195	250	282	118	118	193	205	366	398	171	175	117	127	238	246	308	332	112	152	175	187	179	191	174	186	163	167
SSA-2700	145	145	238	238	187	187	310	310	118	118	241	249	0	0	171	175	117	127	0	0	308	360	124	132	175	203	179	179	186	186	167	171
SSA-2701	141	145	224	242	139	171	298	306	118	118	197	237	342	378	171	175	117	117	234	234	284	312	132	160	175	179	179	179	148	148	175	175
SSA-2702	141	145	228	234	179	195	286	294	118	118	209	213	350	350	175	195	111	117	242	242	284	316	124	128	187	187	191	191	170	174	151	191
SSA-2703	145	145	248	260	171	171	278	298	118	118	241	245	342	374	175	187	117	123	258	262	356	356	140	140	183	183	187	187	190	198	163	171
SSA-2704	141	145	234	258	175	195	0	0	118	124	197	241	0	0	171	175	117	123	0	0	288	372	112	136	199	207	185	191	182	202	159	167
SSA-2705	145	145	210	224	127	179	0	0	118	118	205	213	342	342	171	175	117	125	0	0	248	348	112	112	147	183	0	0	178	186	171	171
SSA-2706	145	145	224	240	167	183	294	298	124	128	249	261	378	414	175	195	117	123	242	254	300	320	124	132	191	207	179	181	170	210	167	167
SSA-2707	145	145	240	246	187	215	290	314	118	118	193	205	350	394	175	191	117	117	238	250	308	340	112	112	183	183	189	191	178	186	163	163
SSA-2708	145	145	216	246	175	183	282	306	118	124	217	241	350	374	171	171	127	129	238	258	300	332	112	124	191	215	183	187	182	202	167	171
SSA-2709	141	145	240	252	167	191	282	298	118	118	209	245	362	394	171	187	117	129	238	246	344	360	112	128	191	195	185	191	174	190	163	179
SSA-2710	145	145	236	246	179	179	294	298	118	118	205	221	366	394	171	175	117	117	230	250	312	364	112	112	143	183	183	197	206	218	159	159
SSA-2711	145	145	224	256	0	0	0	0	0	0	241	241	362	386	0	0	111	127	0	0	284	360	112	112	0	0	183	191	186	190	163	163
SSA-2712	141	145	238	254	183	211	262	294	118	124	241	261	350	370	179	187	117	119	234	238	296	316	120	136	175	179	191	191	178	182	167	183
SSA-2713	145	145	232	244	179	179	306	306	118	118	165	193	370	374	171	171	117	127	234	238	272	276	136	136	179	211	181	187	174	194	133	151

Table 1 : Genotypes obtained in the 51 adipose fin samples. The figure 0 means that the sample could not be interpreted using the given markers.

Conclusions

Genetic profiles of individual fish were created, analysed and compared to our genetic database.

INTERNAL CODE	INDIVIDUAL	ASSIGNATION
SSA-2663	1	CAN-STE-ANNE
SSA-2664	2	CAN-STE-MARGUERITE
SSA-2665	3	CAN-STE-ANNE
SSA-2666	4	CAN-STE-ANNE
SSA-2667	5	CAN-STE-ANNE
SSA-2668	6	CAN-STE-ANNE
SSA-2669	7	CAN-STE-ANNE
SSA-2670	8	USA-PENOBSCOT
SSA-2671	9	CAN-STE-ANNE
SSA-2672	10	CAN-STE-ANNE
SSA-2673	11	CAN-STE-MARGUERITE
SSA-2674	12	CAN-TRINITE
SSA-2675	13	CAN-TRINITE
SSA-2676	14	CAN-TRINITE
SSA-2677	15	CAN-STJEAN
SSA-2678	16	CAN-STE-MARGUERITE
SSA-2679	17	CAN-STJEAN
SSA-2680	18	CAN-TRINITE
SSA-2681	19	CAN-TRINITE
SSA-2682	20	CAN-STE-ANNE
SSA-2683	21	USA-NARRAGUAGUS
SSA-2684	22	CAN-TRINITE
SSA-2685	23	CAN-STJEAN
SSA-2686	24	CAN-STE-ANNE
SSA-2687	25	CAN-STE-ANNE
SSA-2688	26	CAN-TRINITE
SSA-2689	27	CAN-TRINITE
SSA-2690	28	CAN-STE-ANNE
SSA-2691	29	CAN-STE-ANNE
SSA-2692	30	CAN-STE-ANNE
SSA-2693	31	USA-NARRAGUAGUS
SSA-2694	32	CAN-STE-ANNE
SSA-2695	33	CAN-STE-MARGUERITE
SSA-2696	34	CAN-STE-ANNE
SSA-2697	35	CAN-STJEAN
SSA-2698	36	CAN-TRINITE
SSA-2699	37	CAN-TRINITE
SSA-2700	38	CAN-STJEAN
SSA-2701	39	CAN-STE-ANNE
SSA-2702	40	CAN-STE-ANNE
SSA-2703	41	CAN-STJEAN

INTERNAL CODE	INDIVIDUAL	ASSIGNATION
SSA-2704	42	CAN-TRINITE
SSA-2705	43	CAN-STJEAN
SSA-2706	44	CAN-STE-ANNE
SSA-2707	45	CAN-STJEAN
SSA-2708	46	CAN-STJEAN
SSA-2709	47	CAN-STE-ANNE
SSA-2710	48	CAN-STE-MARGUERITE
SSA-2711	49	CAN-STE-MARGUERITE
SSA-2712	50	CAN-TRINITE
SSA-2713	51	CAN-STE-ANNE

Table 2 : Assignment test results

The profile comparisons indicate that the majority of fish analysed are similar to Canadian populations. Table 2 shows the assignment test results of the 51 fish analysed.

La Rochelle, 15 November 2010



Dr Corinne CHERBONNEL
Docteur in Genetics

CNL(11)42

Press Release

North Atlantic Salmon Conservation Organization (NASCO)
Twenty-Eighth Annual Meeting, Ilulissat, Greenland
4 – 6 June 2011

**Working Through the Midnight Sun to Conserve Wild Atlantic Salmon:
Countries Conclude International Negotiations North of the Arctic Circle**

Today, the North Atlantic Salmon Conservation Organization (NASCO) completed its Twenty-Eighth Annual Meeting in Ilulissat, Greenland. As a feeding ground for wild Atlantic salmon, Greenland's waters are an important component in the life cycle of this emotive, beautiful, culturally and ecologically important species. Following a 40 year decline to the lowest levels on record, Atlantic salmon have in recent years shown slight improvements in the numbers returning to a limited number of rivers. While it is far too early for this to be taken as a sign of a recovery, it is encouraging and may reflect the extensive conservation efforts taken by NASCO's members. In recognition of the importance of NASCO's work to Greenlandic fishermen, delegates attending the NASCO meeting from around the North Atlantic met with Greenland's hunters and fishermen's organization (known as KNAPK) at its request just after the official opening of the conference.

Salmon at Sea and the Salmon Summit, 2011

Atlantic salmon are a unique species and their evolution has led to the development of numerous genetically distinct populations within the Atlantic stock. Monitoring has revealed that high rates of mortality occur while salmon are at sea. To address this, NASCO implemented the largest salmon research programme to date, SALSEA. Salmon collected from across the North Atlantic are being DNA fingerprinted to identify their region of origin, including, where possible, to individual rivers. Information on migration routes and health is also being collected. The findings will be presented in an international salmon summit, to take place in La Rochelle, France, from October 11-13, 2011. For more details see www.salmonatsea.com.

Mary Colligan, President of NASCO, said: "I am very excited about the forthcoming Salmon Summit, which will showcase the results of all the hard work that has gone into SALSEA over the years. The information gained cannot fail to support and guide future actions to conserve and manage Atlantic salmon."

Performance Review

While recognising its past accomplishments, NASCO is continuing a period of restructuring to ensure that it is aligned to tackle future issues in salmon management. Having recently completed an initial round of internal review through its "Next Steps" process, NASCO will now conduct a further review of its performance in 2011-2012 using a panel of independent experts.

The NASCO President said: "The challenges facing wild Atlantic salmon are significant. NASCO and its members have now completed an important review of the work of the organisation and implemented significant changes that increase transparency and accountability. Moving forward, NASCO agreed that future reporting and evaluation will have a greater focus on outcomes and measureable results. As we continue efforts to strengthen the organisation, we look forward to the recommendations from our expert panel. Once implemented, these recommendations should further

improve our work and ensure that NASCO is in the best position possible to meet current and future challenges facing wild Atlantic salmon.”

Regulatory measures for distant water fisheries

The current multi-annual regulatory measure will continue in 2011 for the salmon fishery at West Greenland. Under the measure there is no commercial quota. The Faroe Islands also agreed to continue their existing agreement not to fish in 2012.

Notes for Editors:

NASCO is an intergovernmental organization formed by a treaty in 1984 and is based in Edinburgh, Scotland. Its objectives are the conservation, restoration and rational management of wild Atlantic salmon stocks, which do not recognise national boundaries. It is the only intergovernmental organisation with this mandate which it implements through international consultation, negotiation and co-operation.

The Parties to the convention are: Canada, Denmark (in respect of the Faroe Islands and Greenland), European Union (representing its 27 member states), Norway, Russia and USA. There are 35 non-government observers accredited to the Organization.

The 2011 meeting included over 70 scientists, policy makers and representatives of 13 Nations as well as 2 Inter-Governmental Organisations and 11 Non-Governmental Organisations who met to discuss the present status of wild Atlantic salmon and to consider management issues.

For further information contact:

Dr Peter Hutchinson

NASCO

tel +44 (0)131 228 2551 email hq@nasco.int

www.nasco.int

CNL(11)00

List of Papers

CNL(11)1	Provisional Agenda
CNL(11)2	Draft Agenda
CNL(11)3	Explanatory Memorandum on the Agenda
CNL(11)4	Draft Schedule of Meetings
CNL(11)5	Report of the Finance and Administration Committee
CNL(11)6	Applications for Observer Status to NASCO
CNL(11)7	Report on the Activities of the Organization in 2010
CNL(11)8	Report of the ICES Advisory Committee (ACOM)
CNL(11)9	Report of the Tenth Meeting of the International Atlantic Salmon Research Board
CNL(11)10	Request for Scientific Advice from ICES
CNL(11)11	Final Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group
CNL(11)12	Report of the 'Next Steps' Review Group
CNL(11)13	Summary of Annual Reports on Implementation Plans
CNL(11)14	Report of the Meeting of the NASCO/North Atlantic Salmon Farming Industry Liaison Group
CNL(11)15	Report of the Socio-Economics Sub-Group
CNL(11)16	Salmon Fishery at St Pierre and Miquelon
CNL(11)17	Summary of Council Decisions
CNL(11)18	Draft Terms of Reference for an External Performance Review of NASCO's Work
CNL(11)19	Applications for Observer Status to NASCO (Angling Trust)
CNL(11)20	NASCO's role with respect to aquaculture (Tabled By Norway)

Annual Reports on Actions Taken Under Implementation Plans:

CNL(11)21	Annual Report – EU-Denmark
CNL(11)22	Annual Report – EU-Finland
CNL(11)23	Annual Report – EU-Germany
CNL(11)24	Annual Report – EU-Ireland
CNL(11)25	Annual Report – EU-Sweden
CNL(11)26	Annual Report – EU-UK (England & Wales)
CNL(11)27	Annual Report – EU-UK (Northern Ireland)
CNL(11)28	Annual Report – Norway
CNL(11)29	Annual Report – Russian Federation
CNL(11)30	Annual Report – USA
CNL(11)31	Annual Report – Canada
CNL(11)32	Information for the Compilation of a NASCO Implementation Plan and NASCO Focus Area Reports for Spain 2010
CNL(11)33	Annual Report – EU-UK (Scotland)
CNL(11)34	Annual Report - Denmark (in respect of the Faroe Islands and Greenland) Greenland
CNL(11)35	Annual Report on Actions Taken under Implementation Plans – EU-France

- CNL(11)36 Possible Candidates for the External Review Performance
- CNL(11)37 Draft Terms of Reference for an External Performance Review of NASCO's Work
- CNL(11)38 Agenda
- CNL(11)39 2012 Budget and 2013 Forecast Budget
- CNL(11)40 Draft Report of the Twenty-Eighth Annual Meeting of the Council
- CNL(11)41 Draft Press Release
- CNL(11)42 Press Release
- CNL(11)43 Report of the Twenty-Eighth Annual Meeting of the Council
- CNL(11)44 Terms of Reference for an External Performance Review of NASCO's Work
- CNL(11)45 Presentation of the ICES Advice to the Council
- CNL(11)46 Special Session Presentation of the Aquaculture FAR Review Group
- CNL(11)47 Final report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group – EU-Ireland
- CNL(11)48 Respond concerning request on inconsistent with NASCO agreements according to the Swedish FAR on aquaculture and introductions and transfers, and transgenics (2009)