REPORT OF THE FIFTH ANNUAL MEETING OF THE COUNCIL

13-17 June 1988

REYKJAVIK, ICELAND

CNL(88)44

COUNCIL

PRESIDENT:	MR GUDMUNDUR EIRIKSSON (ICELAND)
VICE-PRESIDENT:	MR ALLEN PETERSON (USA)
SECRETARY:	DR MALCOLM WINDSOR

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REPORT OF THE FIFTH ANNUAL MEETING OF THE COUNCIL OF THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION 13-17 JUNE 1988, REYKJAVIK, ICELAND

1. OPENING SESSION

1.1 The President, Mr G Eiriksson, opened the meeting and introduced Mr Jon Helgason, Minister of Agriculture of Iceland, who made a welcoming address (Annex 1). The President joined the Minister in welcoming delegates to the Fifth Annual Meeting of the Council and made an opening statement (Annex 2).

1.2 A list of participants is given in Annex 3.

1.3 The representative of Canada made an opening statement (Annex 4).

1.4 The representative of Denmark (in respect of the Faroe Islands and Greenland) made an opening statement (Annex 5).

1.5 The representative of the European Economic Community made an opening statement (Annex 6).

1.6 The representative of Finland made an opening statement (Annex 7).

1.7 The representative of Iceland made an opening statement (Annex 8).

1.8 The representative of Norway made an opening statement (Annex 9).

1.9 The representative of Sweden made an opening statement (Annex 10).

1.10 The representative of the Union of Soviet Socialist Republics made an opening statement (Annex 11).

1.11 The representative of the United States of America made an opening statement (Annex 12).

1.12 The President expressed appreciation to the members for their statements and closed the opening session.

2. ADOPTION OF THE AGENDA

2.1 The Council adopted its agenda CNL(88)43 (Annex 13).

3. ELECTION OF OFFICERS

3.1 The Council, on a proposal by the representative of Iceland seconded by the representative of Canada, elected Mr Allen E Peterson Jr (USA) to be its President.

3.2 The Council, on a proposal by the representative of Denmark (in respect of the Faroe Islands and Greenland) seconded by the representative of Sweden, elected Mr Svein Aage Mehli (Norway) to be its Vice-President.

4. STATUS OF RATIFICATION OF AND ACCESSIONS TO THE CONVENTION

4.1 The Secretary reported on the status of ratifications of and accessions to the Convention, CNL(88)6 (Annex 14).

5. APPLICATIONS FOR OBSERVER STATUS AT MEETINGS OF THE COUNCIL

5.1 The Secretary reported, CNL(88)7 and CNL(88)26, that he had received three new applications for observer status from non-government organizations. In accordance with the conditions laid down by the Council, which applied to such attendance, he had decided, in consultation with the President, that these applicants and the six non-government organizations already granted observer status should be invited to the Fifth Annual Meeting of the Council. The organizations invited were: L'Association Internationale de Defense du Saumon Atlantique, the Association of Scottish District Salmon Fishery Boards, the Atlantic Salmon Trust, the Salmon and Trout Association, the Scottish Anglers National Association, the Water Authorities Association, the Atlantic Salmon Federation, the Association of Icelandic Angling Clubs, and the Icelandic Federation of River Owners.

6. COORDINATION OF THE ACTIVITIES OF THE REGIONAL COMMISSIONS

6.1 The President reported that he had conferred with the Chairmen of the three Commissions of the Organization regarding the coordination of their activities.

REPORTS OF THE REGIONAL COMMISSIONS

6.2 The Chairmen of the Commissions reported to the Council on their activities.

7. MEMBERSHIP OF THE REGIONAL COMMISSIONS

7.1 The Secretary presented a document on the membership of the Commissions, CNL(88)8.

7.2 Statements were made by the representatives of Norway, CNL(88)34, Iceland and Sweden on their desire to become members of the West Greenland Commission in accordance with Article 10, paragraph 3, of the Convention. The representative of the USSR supported the statement of Norway. Statements were also made by the representatives of Canada and Denmark (in respect of the Faroe Islands and Greenland) on the need to demonstrate that the requirements of that Article were met.

8. REPORT ON THE HEADQUARTERS PROPERTY

8.1 The Secretary reported on the Headquarters property, CNL(88)9.

9. REPORT OF THE FINANCE AND ADMINISTRATION COMMITTEE

9.1 The Finance and Administration Committee presented a report to the Council, FAC(88)9.

9.2 In addition to decisions taken relating to other agenda items, the Council, upon the recommendation of the Committee, took the following

decisions:

(a) to appoint Coopers and Lybrand of Edinburgh as auditors, CNL(88)32

(b) to modify Staff Rule 8.2, CNL(88)46 (Annex 15).

9.3 The Council thanked the Chairman of the Finance and Administration Committee, Mr Karlstroem, and the members of the Committee for their work.

10. CONSIDERATION OF THE 1987 AUDITED ACCOUNTS, 1989 DRAFT BUDGET AND 1990 FORECAST BUDGET

10.1 Upon the recommendation of the Finance and Administration Committee, the Council:

(a) accepted the audited 1987 annual financial statement, CNL(88)10

(b) adopted a budget for 1989 and took note of a forecast budget for 1990, CNL(88)47 (Annex 16).

11. AGREEMENT WITH ICES

11.1 The Secretary reported that the agreement with ICES had continued to operate satisfactorily.

11.2 The President asked the representative of ICES to convey to Dr B Parrish, General Secretary of ICES, the best wishes of the Organization on the occasion of his forthcoming retirement.

12. SCIENTIFIC RESEARCH

12.1 The representative of ICES presented the report of the ICES Advisory Committee on Fisheries Management (ACFM) to the Council, CNL(88)14 (Annex 17).

12.2 The Council referred to reports of fishing beyond 200 nautical miles in the Northern Norwegian Sea to the north of the Faroe Islands. Concern was expressed by several Parties that this fishing was in contravention of the NASCO Convention. Denmark (in respect of the Faroe Islands and Greenland) indicated that measures had been taken so that such fishing as regards Faroese vessels would not recur.

12.3 The Council adopted a decision to request scientific advice from ICES, CNL(88)48 (Annex 18).

12.4 The Council expressed its appreciation to the representatives of ICES for their contribution to the work of the Organization.

13. SCIENTIFIC AND STATISTICAL INFORMATION

13.1 The Secretary introduced a statistical paper including official catch returns according to Party for 1987 and historical data by Party, CNL(88)15. The Council decided that official catch returns in future be set out in the format shown in Annex 19 and that any other information on catches be presented to the Council for its information only.

13.2 The Council adopted a format for the return of official catch statistics to NASCO, CNL(88)36 (Annex 20). The Council discussed the question

of unreported catches and agreed that the question could be reviewed in the light of the analysis of catch statistics referred to in paragraph 13.3 below.

13.3 The Secretary referred to the analysis of catch returns using the questionnaire that had been agreed at the Fourth Annual Meeting, CNL(88)16. The analysis was intended to look at the comparability of catch statistics and to assess the use of different definitions, including the term "round fresh weight equivalent". Not all Parties had completed this questionnaire and the President asked those Parties that had not completed their returns to do so as soon as practicable. It was decided that the Secretary submit the analysis document in draft form to the Parties for consultation before it was produced as a Council document.

14. LAWS, REGULATIONS AND PROGRAMMES

14.1 The Secretary presented a progress report on the Laws, Regulations and Programmes database, CNL(88)17. He described the database and indicated its capabilities to select information on a given topic. Not all Parties had submitted their Laws, Regulations and Programmes so the database was not yet complete.

14.2 The President asked those Parties that had not yet completed their returns to do so as quickly as possible. It was decided that the Secretary submit to each Party its returns in the agreed format so that the information could be checked. When this step was complete the Secretary would complete an overall review of the Laws, Regulations and Programmes database. As part of the review the Council might decide on the level of detail which would require notification of a change.

14.3 The database would then be available for individual use by the Parties and it could be used to select information relevant to the subjects being discussed by the Council at any future date. The information would be updated annually by the returns made under Articles 14 and 15 of the Convention.

15. SALMON TAGGING

15.1 The Council agreed that the new compilation of tag release information, CNL(88)18, requested by NASCO and provided by ICES was acceptable. The Secretary was asked to consult with the General Secretary of ICES to request that this procedure continue on an annual basis so that the information be deposited with NASCO. The Secretary was asked to consider how the information might then be presented to the Council in a summary form.

15.2 The Council considered a report by the Secretary on a possible NASCO lottery scheme to improve tag returns, CNL(88)20. This included a proposal by the United States to fund such a lottery. The Council decided to establish a NASCO lottery, CNL(88)39 (Annex 21), and charged the Secretary with determining the detailed terms and conditions on conduct of the lottery and ensuring that the lottery be conducted in conformity with the Headquarters Agreement.

16. REPORT ON THE POLICY OF THE NORTH AMERICAN COMMISSION ON INTRODUCTIONS

16.1 The Chairman of the North American Commission described the

establishment of the Commission's Bilateral Scientific Working Group on Salmonid Introductions and Transfers. The Co-Chairman of this Group presented a synopsis of the activities of the Group to date, CNL(88)28 (Annex 22).

17. POTENTIAL THREATS TO WILD STOCKS FROM AQUACULTURE

17.1 The Secretary, in accordance with the request of the Council at its Fourth Annual Meeting, presented a report on the potential impacts of salmon farming on wild stocks, CNL(88)21 (Annex 23). The Council recognised the serious nature of some of these threats and asked that a number of steps be taken.

17.2 The representative of Norway introduced a statement on this question, CNL(88)33, and referred to the intention of Norway to host a seminar on the interaction between reared and wild salmon.

17.3 The Council requested the Secretary in consultation with the General Secretary of ICES to convene a one-day meeting during the first half of 1989 to assemble what information was available on genetic threats to wild stocks and to make a report to the Sixth Annual Meeting. The Secretary was also asked to consult with Norway to see if these ends could be achieved through participation in the symposium referred to in paragraph 17.2.

17.4 The Council also decided to consider the possibility of developing an internationally agreed code of practice or series of recommendations to minimise the impacts of aquaculture on wild stocks as part of its responsibility to conserve salmon stocks under the Convention. The Council asked the Secretary to produce a review of those actions which might be addressed. The Council further asked the Secretary to prepare a paper on the mechanisms, costs and benefits of establishing gene banks for threatened stocks for consideration at the Sixth Annual Meeting. It was stressed that these papers should be presented to members well in advance of their consideration at the Sixth Annual Meeting.

17.5 The Council further agreed to ask the Secretary to consult with the Secretary of ICES on information available on environmental threats posed to wild salmon stocks by salmonid aquaculture.

17.6 The database on Laws, Regulations and Programmes should be used to produce a review of legislation relating to introductions and transfers.

18. IMPLEMENTATION OF THE CONVENTION

18.1 The Secretary presented a report on the returns made under Articles 14 and 15 of the Convention, CNL(88)22 (Annex 24).

18.2 The Council agreed that reports should continue under the agreed format but asked the Secretary to consider how the summarised information submitted under Article 15 might be produced in a more standard form as regards content and length and to report back at the Sixth Annual Meeting.

19. EXTERNAL RELATIONS OF THE ORGANIZATION

19.1 The Secretary reported to the Council on the operation of the Headquarters Agreement and on other aspects of external relations of

the Organization.

20. CONSIDERATION OF A DRAFT REPORT OF THE ACTIVITIES OF THE ORGANIZATION IN 1987

20.1 The Council adopted a report to the Parties, CNL(88)23, in accordance with Article 5, paragraph 6, of the Convention.

21. OTHER BUSINESS

21.1 The President and Vice-President expressed their gratitude to the Secretary for the outstanding service he has provided to the Organization.

21.2 The Council decided to renew the contract of the Secretary for a renewable period of five years from 15 June 1988, CNL(88)49(Annex 25).

22. DATE AND PLACE OF NEXT MEETING

22.1 The Council agreed that its Sixth Annual Meeting should be held in Edinburgh from 13 to 16 June 1989.

22.2 The Council agreed that its Seventh Annual Meeting be held during the period from 11 to 15 June 1990. The Meeting would be in Edinburgh unless an invitation is received by the time of the Sixth Annual Meeting to hold the Meeting elsewhere.

23. CONSIDERATION OF DRAFT REPORT OF THE MEETING

23.1 The Council considered a draft report of the meeting, CNL(88)30.

24. CONSIDERATION OF PRESS RELEASE

24.1 The Council considered a draft press release, CNL(88)31 (Annex 26).

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REYKJAVIK

ANNEX 1

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

WELCOMING ADDRESS BY MR JON HELGASON, MINISTER OF AGRICULTURE

Mr President, Distinguished Representatives, Delegates and Observers.

It is a great pleasure to welcome you to this meeting in Reykjavik, the site of the diplomatic conference in 1982, when NASCO was established. For us here in Iceland the international cooperation within the NASCO forum is very important, especially with respect to proper management of all existing Atlantic salmon fisheries.

It is well known that salmon fishing is prohibited within the Icelandic territorial limits. This is primarily due to the far-sightedness of the Icelandic farmers back in the 1930s, who had been carrying out terminal fisheries for salmon for centuries and appreciated their value in sound management of salmon.

This ban is also the basis for the private salmon ranching operations which have started in recent years. These operations are unique for Iceland within the North Atlantic and are a part of the great increase in aquaculture activity in this country in recent years. To ensure the success of these programs it is very important to maximize returns of salmon to freshwater. One aspect of this is to reduce fishing pressures on these salmon in the ocean.

Experience has taught Icelanders, as well as other nations, that all fish stocks need to be carefully harvested. With existing technologies it is very easy to over-exploit fish stocks. But scientific knowledge is the basis for sound management.

Icelanders have, therefore, put a great emphasis on fisheries research in order to strengthen the management basis. One must be careful not to upset the ecological balance, where over-exploitation of a valuable species may lead to an increase in less desirable ones.

Finally I want to express the hope that this meeting be a productive one for all parties concerned and that you distinguished foreign visitors may have fond memories of your stay here in Iceland.

13 JUNE 1988
REYKJAVIK

ANNEX 2

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE PRESIDENT

Distinguished Representatives and Commissioners, Delegates, Observers, Ladies and Gentlemen, it is an honour and a pleasure to welcome you here to Iceland for the Fifth Annual Meeting of the Council and Commissions of the North Atlantic Salmon Conservation Organization. I hope that you will enjoy your stay here. It is a particular pleasure to welcome you to Reykjavik where the diplomatic conference to establish the NASCO Treaty was held in 1982.

NASCO has come a long way in its short life. There were those who thought that the unanimity rule in our regulatory measures, the very different perspectives from which the Parties view the resource and the single species nature of the Treaty would lead to stalemate. In fact, we have already reached a situation where each regional Commission of NASCO has had regulatory measures in place. This is a big step forward and enables the Parties to ensure stability in the North Atlantic for one of the most prized species. It means that there is a regular opportunity to renew our scientific knowledge and to make decisions on management. These measures have involved sacrifices but we trust that the species is now safer from decline than before NASCO. We have begun the process of conservation and rational management.

As we start our Fifth Annual Meeting I should like you now to consider how the Organization might further its role in salmon conservation under the Convention. As international guardians of the wild stocks we may well find that history will judge us more on these other areas than on our success in fixing annual quotas, vitally important though that is.

In this respect we have much to consider and consolidate.

We have already taken the first steps toward our exchange of Laws, Regulations and Programmes. This work must proceed.

We are committed to analyse catch statistics from all the North Atlantic nations concerned with salmon so that we can assess the comparability of these statistics. We must continue these efforts so that our statistics are meaningful.

We have developed the procedure for making annual returns indicating what steps we have taken to implement the Convention. This allows all of us to know of the actions taken by the others.

We will consider measures that we can take to strengthen tagging programmes and to improve return rates.

And we shall be discussing the impact on the wild stocks of the very recent and very rapid growth in salmon aquaculture, an industry that could pose a real threat to wild stocks if not properly regulated.

Finally I should like to say, as this is my last meeting as your President, that we have achieved all this in a remarkably good atmosphere of international cooperation and consultation. This has been created by all those who have taken part the Representatives, the delegates and advisers, the observers and the Secretariat. I welcome you all here to continue this cooperative and constructive process.

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REYKJAVIK

ANNEX 3

FIFTH ANNUAL MEETING OF THE COUNCIL
13-17 JUNE 1988, REYKJAVIK, ICELAND

CNL(88)25

LIST OF PARTICIPANTS

* Denotes Head of Delegation

CANADA

*MR BILL ROWAT	Representative Department of Fisheries and Oceans, Ottawa, Ontario
DR GABY WARD	Representative Champlain College, Quebec
DR WILFRED CARTER	Representative Atlantic Salmon Federation, St Andrews, New Brunswick
DR DAVID MEERBURG	Department of Fisheries and Oceans, Ottawa, Ontario
MS LOUISE COTE	Department of Fisheries and Oceans, Ottawa, Ontario
MR BERNARD VEZINA	Department of Fisheries and Oceans, Ottawa, Ontario
FATHER DES MCGRATH	Fishermen, Food and Allied Workers Union, St Johns, Newfoundland
MR MICHEL BROUILLARD	Ministere du loisir, de la chasse, et peche, Quebec
MR GLENN BLACKWOOD	Department of Fisheries, St Johns, Newfoundland

DENMARK (IN RESPECT OF THE FAROE ISLANDS AND GREENLAND)

*MR EINAR LEMCHE	Representative Greenland Home Rule, Nuuk, Greenland
MR ARNI OLAFSSON	Representative Ministry of Foreign Affairs, Copenhagen
MR OLE SAMSING	Representative Ministry of Foreign Affairs, Copenhagen
MR JENS MOELLER JENSEN	Greenland Fisheries Research Institute, Copenhagen
MR HJALTI i JAKUPSSTOVU	Foroya Landsstyri, Torshavn, Faroe Islands
MR ERNST THORSOE	Greenland Home Rule, Nuuk, Greenland

MS MALENE JENSEN	Greenland Home Rule, Nuuk, Greenland
EEC	
*MR HENRIK SCHMIEGELOW	Representative Fisheries Directorate-General, EEC Commission, Brussels
MR JOHN SPENCER	Representative Fisheries Directorate-General, EEC Commission, Brussels
MR WOLFGANG RINGE	FRG Representative of the Council of the European Communities, Brussels
MR AUGUSTO BETTE	Council of the European Communities, Brussels
MR SEAN MCDONALD	Permanent Representation of Ireland to the EEC, Brussels
MR PASCHAL LYNG	Department of the Marine, Dublin
MS EILEEN TWOMEY	Department of the Marine, Dublin
MR NICK BROWN	Ministry of Agriculture, Fisheries and Food, London
MR IAN WHITELAW	Department of Agriculture and Fisheries for Scotland, Edinburgh
MR BOB WILLIAMSON	Department of Agriculture and Fisheries for Scotland, Edinburgh
MR BILL MALCOLM	Department of Agriculture and Fisheries for Scotland, Edinburgh
MR TED POTTER	Ministry of Agriculture, Fisheries and Food, Lowestoft
DR KEVIN O'GRADY	Ministry of Agriculture, Fisheries and Food, London
DR DICK SHELTON	Department of Agriculture and Fisheries for Scotland, Pitlochry
MR AGUIRRE FERNANDEZ	Secretaria General de Pesca Maritima, Madrid
MRS ELIANE VAN GYSEGEM	Council of the European Communities, Brussels
MR BENT PALLISGAARD	Ministry of Fisheries, Copenhagen
FINLAND	
*MR KARI AIRAKSINEN	Representative Ministry of Agriculture and Forestry, Helsinki
MR EERO NIEMELA	Representative Finnish Game and Fisheries Institute, Helsinki

ICELAND

*MR GUDMUNDUR EIRIKSSON	Representative Ministry of Foreign Affairs, Reykjavik
MR HELGI AGUSTSSON	Representative Ministry of Foreign Affairs, Reykjavik
MR ARNI ISAKSSON	Representative Institute of Freshwater Fisheries, Reykjavik
MR THOR GUDJOHNSON	Institute of Freshwater Fisheries, Reykjavik
MS LILJA VIDARSDOTTIR	Ministry of Foreign Affairs, Reykjavik

NORWAY

*MR SVEIN MEHLI	Representative Directorate for Nature Management, Trondheim
MR TORMOD KARLSTROEM	Representative Ministry of the Environment, Oslo
MR LARS HANSEN	Directorate for Nature Management, Trondheim
MR GEORG RIEBER-MOHN	Regional Boards of Salmon Fishery, Oslo
MR EYSTEIN ISAKSEN	Embassy of Norway, Reykjavik

SWEDEN

MR PER FORSHELL	Ambassador, Embassy of Sweden
*MR INGEMAR OLSSON	Representative National Board of Fisheries, Goteborg

USA

*MR ALLEN PETERSON	Representative National Marine Fisheries Service, Woods Hole, Mass.
DR FRANK CARLTON	Representative National Coalition for Marine Conservation, Savannah, Georgia
MR RICHARD BUCK	Representative Restoration of Atlantic Salmon in America Inc, Dublin, New Hampshire
MR ARTHUR NEILL	National Marine Fisheries Service, Woods Hole, Mass.
MR STETSON TINKHAM	US Department of State, Washington DC
MR GILBERT RADONSKI	Sport Fishing Institute, Washington DC

DR VAUGHN ANTHONY	National Marine Fisheries Service, Woods Hole, Mass
MR ROBERT JONES	Connecticut Bureau of Fisheries, Hartford, Connecticut
DR DAVID EGAN	Connecticut River Atlantic Salmon Commission, Guilford, Connecticut
DR DAVID GOLDTHWAITE	US Fish and Wildlife Service, Newton Corner, Mass.
MR HAL LYMAN	Salt Water Sportsman Inc, Boston, Mass.
MR JAMES MCCALLUM	Merchant Marine & Fisheries Committee, US House of Representatives, Washington
DR PAUL RAGO	US Fish and Wildlife Service, Kearneysville
MR HOWARD LARSEN	US Fish and Wildlife Service, Newton Corner, Mass.
MR JEFF PIKE	Merchant Marine & Fisheries Committee, US House of Representatives, Washington
MR WILLIAM BRENNAN	Dept of Marine Resources, Augusta, Maine
MR JAY DEHMLOW	United States Embassy, Reykjavik

USSR

*DR GUEOZGUI LUKA	Representative PINRO, Murmansk
DR ALEXANDRE ZUBCHENKO	PINRO, Murmansk
MR KONSTANTIN BUDANOV	Murmanrybvod, Murmansk
MR GUENRIKH BOROVKOV	Ministry of Fisheries, Moscow

ICES

DR EMORY ANDERSON	International Council for the Exploration of the Sea, Copenhagen
MR BERNARD VASKE	Institut fur Hochseefischerei und Fischverarbeitung, German Democratic Republic

NON-GOVERNMENT OBSERVERS

L'ASSOCIATION INTERNATIONALE DE DEFENSE DU SAUMON ATLANTIQUE	M. JACQUES TISSIER MME SYLVIE TISSIER
ATLANTIC SALMON TRUST	REAR ADMIRAL JOHN MACKENZIE
WATER AUTHORITIES ASSOCIATION	DR CHRIS HARPLEY

ASSOCIATION OF ICELANDIC ANGLING CLUBS	MR RAFN HAFNFJORD
FEDERATION OF RIVER OWNERS	MR THORSTEINN THORSTEINSSON MR EINAR HANNESSON

SECRETARIAT

SECRETARY	DR MALCOLM WINDSOR
ASSISTANT SECRETARY	DR PETER HUTCHINSON
PA TO SECRETARY	MISS SANDRA LORIMER
PA	MRS THERESA GAWTHORNE
	MR SIGURDUR EINARSSON
	MRS ANNA STEINSEN
	MISS SIGRIDUR GUNNARSDOTTIR
	MISS HREFNA LUTHERSDOTTIR

13 JUNE 1988
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ANNEX 4

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF CANADA

Mr. President, Minister, Mr. Ambassador, Representatives, Delegates, Observers:

It is my great pleasure to have the opportunity on behalf of Canada, to make a few remarks at this opening session of the NASCO annual meeting. I would like to express our appreciation for the warm words of welcome extended by our Icelandic hosts. Reykjavik is now known as being a place for high level meetings and negotiations, a summit site.

Mr. President, we may not discuss topics of such importance as peace and security in our debate during this week, but I am confident that the spirit of Reykjavik, thanks to the warm hospitality of Iceland and thanks as well to our most able President, will pervade our negotiations. We have come to know and to appreciate one another in these meetings and we always look for frank and open discussions of the issues before us. Some of these issues are tough to handle and, it may take a lot of dedication sometimes to arrive at mutually agreed and satisfactory solutions.

As you know, Canada decided to maintain in 1988 the same stringent approach in salmon conservation it has been following since 1984. We are into the last year of our 5 year salmon recovery plan, the question therefore is what comes next. I believe that to answer such a question a few basic facts are in order. For Canada, as it is for many of the countries represented around the table, Atlantic Salmon is a valuable fishery, both for the commercial and the sportfish sectors. Expenditures incurred by salmon anglers represent dollars and jobs for the many businesses in the sport fishing industry. Most of the money spent on Atlantic Salmon angling is not in large urban centres, but in the smaller, more isolated communities where employment opportunities are limited. Studies have shown that economic benefits derived from the Atlantic Salmon sportfishery are very significant and could be much greater. As well the commercial harvesting of Atlantic Salmon has been of critical importance to some of our remote coastal communities especially in Newfoundland and Labrador where alternative employments are not plentiful and resources are limited.

We have recognized this and other NASCO countries recognize these basic facts as well. You may be aware that, last year scientists were forecasting important surpluses of multi-sea-winter salmon in some of Canada's major Maritime rivers. While there was considerable domestic pressure to loosen up we had decided to maintain the on-going management approach and to refrain from relaxing the five-year conservation strategy. It was fortunate that we did, projected surpluses did not materialize and spawning requirements were barely met in some rivers. Poor water conditions were experienced in many Canadian Atlantic Salmon rivers in 1987. This resulted in a much shorter angling season. Scientists advise that both the adult salmon stocks and most of the young salmon produced since the beginning of the 5 year strategy in 1984 have been affected by these conditions. The real impact will not be known for another few years.

Because of uncertainties associated with forecast returns and environmental conditions, and because salmon stocks have not yet adequately recovered, Canada has decided to maintain intact its on-going strategy for 1988 and will be looking for similar restrictions by other relevant parties, during the upcoming discussions.

I don't think that anyone would wish to question the facts. While negotiations in certain Commissions are likely to be difficult, I know we understand much better each other's preoccupations than we did a few years ago and I think we now have to recognize that the scientific information we have is much more reliable and more thorough than it used to be. This is not to say however that scientific evidence is the only criteria. It can only be part of the complex issue that brings us together today.

In closing, I wish to introduce my fellow Canadian Commissioners, Dr. Gaby Ward, a well-known biologist in Canada and Dr. Wilfred Carter already known to most of you in this forum.

Mr. President, I cannot fail to emphasize how outstanding your stewardship has been for this Organization. If we are here today striving together to develop, in common, satisfactory solutions, rather than go our seperate ways in total disregard for each others concerns, you are undoubtedly greatly responsible for it.

13 JUNE 1988 ANNEX 5

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF DENMARK
(IN RESPECT OF THE FAROE ISLANDS AND GREENLAND)

Mr President, Minister, Delegates and Observers.

In keeping with the homing instinct of the species with which we are dealing, we have this time returned to our place of origin, Reykjavik. Speaking for Denmark (in respect of the Faroe Islands and Greenland), I would like to thank the Government of Iceland for inviting NASCO to have its fifth annual meeting here in Reykjavik, which is not only the site of the agreement on the Convention but also lies midway between the Faroe Islands and Greenland.

At the outset of the Fifth Meeting one should expect NASCO to have overcome its starting troubles and to have achieved a certain routine in dealing with its task of managing North Atlantic Salmon. I think this is, at least partly, true. Regulatory measures have been made for all three Commission areas. We all acknowledge that these management decisions have not been reached easily, and they have not been based upon sufficient scientific evidence. However, in the scientific field considerable progress has been made. This years working group Report backed by ACFM indicates that serious intellectual efforts have been made in order to create models capable of handling the extremely complicated situation of managing such highly migratory stocks, with their special anadromous behaviour.

We have taken note of the fact that the quality of the results of the endeavours of the scientists can not be better than the quality - and quantity - of data input. We therefore hope that all Parties will do their utmost to increase available knowledge of the salmon which is fished throughout the geographical area of the Convention, so the scientists may get a realistic picture of the life and death of salmon throughout its migratory range. So far it seems that distant water intercepting fisheries only to a minor extent contributes to the total mortality of the stocks.

We all agree that it is important to reach agreement on regulatory measures in the Commissions of NASCO. However, fixing these measures is a difficult political process. It requires of all Parties that they try to understand each other, that they respect each others right to take their share, and that there shall be a connection between burdens and benefits for everybody involved.It is the hope of our delegation that these fundamental prerequisites for a fruitful cooperation have been understood by now and will be respected by all Parties. We for our part will try to do our best, also this year, where the regulatory measures concerning West Greenland are to be reconsidered.

Thank you Mr President.

13 JUNE 1988
REYKJAVIK

ANNEX 6

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE
OF THE EUROPEAN ECONOMIC COMMUNITY

Minister, Mr. President, distinguished Delegates, Observers, Ladies and Gentlemen.

The Community looks forward to this 5th Annual Meeting of NASCO in the expectation of a fruitful and constructive meeting. This expectation is based on the considerable progress which has been achieved by NASCO to date. Through the adoption of meaningful regulatory measures and the co-ordinated approach of Contracting Parties within NASCO to increasing the scientific knowledge of the salmon stocks, a spirit of co-operation has been fostered which bodes well for the future of NASCO.

As a major state of origin for the North Atlantic salmon stocks the Community is conscious of its responsibilities and commitments under both the Law of the Sea and NASCO Conventions. The conservation measures in force in the Member States of the Community bear testimony to the Community's commitment to the North Atlantic salmon resource; a commitment which is not a new one but one which can be traced back over centuries. There is no sense of complacency within the Community about the status of its salmon stocks. The human and financial resources devoted to the conservation, restoration and rational management of the salmon stocks within the Community continue to expand and are commensurate with the social and economic importance of the resource.

NASCO over the past four/five years has firmly established itself within the field of international fisheries management. In this process, NASCO has demonstrated its capacity to adapt its decisions to existing information and policy frameworks. Against this background the Community looks forward to working with other Parties in arriving at balanced and meaningful regulatory measures at the 5th Annual Meeting.

Finally may I on behalf of the European Community delegation express its appreciation to our host, the Government of Iceland, for extending the invitation to NASCO. The beautiful location of Reykjavik will no doubt act as an envigorating factor in promoting fruitful discussions.

13 JUNE 1988
REYKJAVIK

ANNEX 7

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF FINLAND

Mr President, Ladies and Gentlemen,

The meeting in Edinburgh last year was a success in the history of this Organization. Then for the first time we succeeded in reaching a decision concerning regulation of the interceptional fishery of salmon stocks in the Atlantic. In this context I would also mention the Norwegian decision to prohibit salmon fishery with drift-nets as from the end of the 1988 season. We in Finland welcome these decisions as a good start toward a biologically sound and balanced salmon fishery.

We are confident that appropriate measures to regulate the salmon fishery in the sea as well as in the rivers will be adopted also in the future in close cooperation of Member Parties through this Organization.

Mr President, in our opening statements in previous years we have drawn your attention to the possible risks of fish diseases and genetic disorders which net-cage farming may cause to wild salmon stocks. This is still our main concern. A parasite, Gyrodactylus salaris, which is native in the waters draining into the Baltic Sea and do not harm fish there, has been transferred, as we believe, with fingerlings into the coastal waters of Norway. As far as we know it has already infected several salmon rivers in Norway and is approaching the River Tana, which is one of the most important reproduction rivers of salmon in the Convention area. According to this, the question of preventing fish diseases was one of the most important points during negotiations between Finland and Norway on revision of the agreement of fisheries in the River Tana. The revised agreement is expected to come into effect as from the beginning of the 1989 season. In the interim, Finland has already issued its own regulations which prevent introductions of live fish from other parts of Finland into the water courses of the Rivers Tana and Nejden. We hope this will safeguard these important salmon rivers against contamination of diseases from the direction of Finland. We also wish best success to our Norwegian colleagues in their struggle against the parasite.

Mr President, we wish that our meeting here in Reykjavik will be successful in its important work for the benefit of valuable salmon resources common to all Member Parties. We are also very pleased that this meeting is convened in Iceland. We are looking forward to getting acquainted with the Icelandic activities in salmon management.

Thank you, Mr President.

13 JUNE 1988
REYKJAVIK

ANNEX 8

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF ICELAND

Mr President, Distinguished Representatives, Delegates and Observers.

Icelandic salmon fisheries and management are in many ways at a crossroads.

Aquaculture activity has increased dramatically in the last 3 years, with over a 15 fold increase in smolt production since 1985. This means that this year there will have to be accommodated over 12 million salmon smolts in land or sea-based rearing units or in salmon ranching facilities. Over a million smolts are already released from ranching stations which equals the estimated quantity of wild smolts leaving Icelandic salmon streams per annum. Already this year it is estimated that ranched salmon will out number the catch of wild fish. Salmon ranching can also be a powerful tool to enhance the catch of salmon in our streams but it must be properly regulated so as to protect the wild strains in the streams. There has been a further 10 fold increase in salmon rearing in the last 3 years, some of it in sea cages which in some cases are uncomfortably close to salmon streams. Regulations regarding desirable distances are being formulated.

Domesticated Norwegian stocks have been imported and are being reared in a few rearing facilities. There is increasing pressure to distribute this genetic material to various salmon farms and sea-cages, where the fish could escape with unknown consequences. This prospect is of increasing concern to Icelandic biologists.

Increased incidence of fish diseases, especially in salmon farms, have been an unavoidable consequence of increased rearing and ranching activity. Reported diseases, however, are relatively few compared to many neighbouring countries.

There is no doubt that salmon culture in various forms will play an important part in the Icelandic economy, especially rearing in land based units and ranching, but this development has to be carefully monitored and guided in order to avoid ecological accidents.

Although each member country has to resolve its own problems in this respect I feel that NASCO should be a scientific avant-garde in this field and welcome the initiative that it already has taken in this area by collecting and presenting relevant scientific information.

I am dwelling on these matters at such length since the Icelandic salmon stocks seem otherwise to be in a healthy state. With proper management and control I believe that the salmon stocks can be preserved in their present condition. It is well known that they are almost exclusively harvested in fresh water and strictly managed. Over-exploitation is thus practically non-existent.

With rapidly expanding commercial salmon ranching programs, Iceland strongly opposes salmon fishing in the sea and the resolution of the Icelandic Althing from 1983 is well known to this forum. As before we will cooperate with other countries of origin with the end in mind of prohibiting all sea fisheries which could potentially threaten Icelandic salmon resources.

13 JUNE 1988
REYKJAVIK

ANNEX 9

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF NORWAY

Mr. President, Minister, distinguished Delegates and Observers.

It is a great pleasure for my delegation to be here on Iceland. Six years have passed since the conference in Reykjavik in January 1982 agreed on a Convention for the Conservation of Salmon in the North Atlantic Ocean. In this short period of time, NASCO has developed into an established Organization carried forward and supported by a broad engagement and a real interest from the member states to work for a common goal.

As for other organizations, we can see different phases in the work of NASCO. From the difficult but necessary negotiations focused on catch quantities to a more broadened field of engagement penetrating into ecological aspects of the salmon stocks.

Norway welcomes very much this widened perspective of NASCO. This is in close connection to what seems to be the realities which the salmon stocks have to face in the future. Most recently we have had an algae bloom in Skagerrak and the near costal waters in the southern part of Norway. This bloom which has an international origin, bear all signs of an ecological system in great imbalance. Among dead marine fishes and invertebrates we also found dead sea-trout and salmon and at one point we feared a major damage to the stocks. This due to the possible killing of the outgoing smolts in the near costal areas and secondly by attacking adult salmon on the way to the rivers. Special measures for salmon fisheries were implemented as an eventuality to protect and to ensure sufficient spawners. The immediate situation is now in some way clarified. The runs to the rivers seems normal but there is still an uncertainty as to what eventually happened to the outgoing smolts.

Acid rain is another factor that we see as a major threat to the salmon stocks. We already face heavy losses and substantially reduced salmon production caused by acid rain in our rivers. International negotiations are ongoing and new international agreements are worked out to reduce the sulphur emission. The situation, however, is so serious that a broad engagement from NASCO and within NASCO are most welcome.

The relationship between aquaculture for salmon and the wild salmon stocks is a field which needs considerably more attention in the future. It is in the common interest for both sides to protect and to ensure the healthiness of the wild stocks and in that way secure the genetic material within these populations.

With the tremendous increase in the quantity of farmed fish we will see in the future, Norway will strongly underline the need for research activities and the development of management plans within this field. Certainly initiatives and engagements on this topic seems natural within the frame of NASCO.

The membership of Norway in the West-Greenland Commission ref. to Article 10, paragraph 2 was decided last year. We see this membership as an important question for Norway. Further research is therefore initiated to give more information which could lead to a renewed evaluation of the Norwegian membership in that Commission.

In Norway we have continued and further developed new measures and regulations for salmon. The hearing process for the new Salmon Act is concluded. At the same time new regulations that may control the by-catch of salmon, are decided.

With these short remarks Mr. President I will on behalf of the Norwegian delegation say that we look forward to this meeting with great interest. I can assure you of my delegations full co-operation to arrive at successful conclusions.

Thank you Mr President.

13 JUNE 1988
REYKJAVIK

ANNEX 10

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF SWEDEN

Mr President, Distinguished Representatives, Delegates and Observers.

Sweden looks forward to this Fifth Annual Meeting of NASCO in the expectation of a constructive and fruitful meeting.

Considerable progress has been achieved by NASCO up to date. The Swedish delegation like presumably all other delegations especially welcomed that the North East Atlantic Commission during the last Annual Meeting could reach an agreement on regulatory measures for fishing of salmon in the Faroe Islands. We also recognize with satisfaction the accepted, growing wider role of NASCO. The experience gained in utilization of the living resources of the world oceans supports the evidence that only in the course of international cooperation would it be possible to solve the problems relating to protection and rational management of such a resource as the Atlantic salmon. It has been expressed that the management of shared stocks is especially important in the north-east Atlantic where 80% of the stocks migrate between different fishery or economic zones. In addition to this we have the problems of biological interactions between different species and the need for multispecies assessments.

We recognize several threats, which can strongly affect the salmon stocks in a negative way. It is quite evident that to be able to have a rational utilization, the different ecosystems with salmon must be in balance. Thus there are strong responsibilities both for parties with home-water fisheries and for those parties conducting an interception fishery. During the last meeting the Finnish delegation raised the question of possible risks of fish diseases to wild salmon stocks emanating from fish farms in coastal areas. The delegation also expressed its concern about possible risks of genetic erosion caused by escapees from net-cages. We are now pleased to note that a relevant document "Potential threats to wild stocks from aquaculture" has been produced by the NASCO Secretariat.

A dramatic disorder in the ecosystems of the Skagerrak-Kattegatt area has occurred this spring. A very large phytoplankton bloom of mainly one species has caused considerable losses to both natural and farmed fish populations in the area. The matter was discussed at a meeting of the Bureau of ICES in May and the Bureau requested the Council's Working Group on Primary Production to prepare proposals for scientific studies regarding the bloom. The highly dynamic character of the bloom necessitates further interdisciplinary and international studies on several ecophysiological processes and also post-bloom studies devoted to bottom fauna and effects on the higher trophic levels of the food-web. We do not know yet if there have been any negative effects on the Atlantic salmon. There are, however, indications of a delayed migration of returning salmon in three rivers and effects on the smolts leaving the rivers cannot be excluded. Dead specimens of sea trout have been found along the coast. The disorders of the ecosystems strongly call for international cooperation to detect the general mechanisms responsible for bloom formation in the area in question and the anthropogenic impact behind the mechanisms. We are all dependent on balanced ecosystems. The Skagerrak-Kattegatt area may be especially susceptible due to the fact that it receives water from both the Baltic and the North Sea.

The Swedish Delegation is of the opinion that it is of utmost importance that we also have a balanced organization for the conservation of the North Atlantic

salmon stocks, thus an organization without institutional disorders. As was very clearly stated by the Norwegian Delegation during the last meeting the Convention - Article 10 and 11 - suffers from a lack of balance in favour of the powerful Parties. We have to see to it that the Organization with its administrative structure shall be fully utilised on the basis of fundamental, biological facts and principles. Sweden will continue to regard NASCO as an open Organization, aiming at effective and fruitful international cooperation within salmon conservation work between all Parties concerned. Sweden very much welcomed that USSR became a full member of NASCO.

During the Annual Meeting last year especially you, Mr President, and the delegations of Norway and USA commented upon the wider roles of NASCO concerning several issues. We can see in the agenda of this Annual Meeting that the Organization has made progress in this direction and Sweden is willing to support a broadening of the activities of the Council.

13 JUNE 1988
REYKJAVIK

ANNEX 11

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF THE UNION OF SOVIET SOCIALIST REPUBLICS

Minister, President, distinguished Ladies and Gentlemen, Colleagues.

On behalf of the delegation from the Soviet Union let me firstly thank the government of Iceland for inviting us to the country and welcome all participants of the 5th Annual Meeting of the North Atlantic Salmon Conservation Organization.

The Soviet Union having become a member of NASCO supports its policy on the conservation, restoration and enhancement of stocks of one of the most valuable species of commercial fishes.

The Soviet Union approaches this problem with a great responsibility. In recent years a number of measures to limit the catch in the main commercial areas in the USSR home waters were undertaken by our country. It was done in spite of certain losses which fishermen had sustained. Much effort is put into the artificial reproduction of Atlantic salmon. Annually, salmon hatcheries produce over 1 million Atlantic salmon smolts.

The Soviet Union believes that the member-countries of the Organization will realize the policy of the Soviet Union concerning the problem of Atlantic salmon fishery management and first of all the problem on the prohibition fishery salmon in the sea.

The Soviet Union considers that the fishery in the sea leads to the irregular exploitation of salmon stocks and depression of separate populations and disturbance of existing funds of genes, until the methods of separating the stocks in feeding areas is missing.

Apparently, it is high time to discuss this problem more closely. In recent years a general trend toward a reduction in catches is observed in the Northeast Atlantic, which must be taken into consideration; all the more so, that in our scientists opinion, the low abundant year classes will recruit to the fishery in the very near future.

I wish the members of the Meeting fruitful work and the adoption of constructive solutions contributing to that noble purpose, for which we are gathered here.

13 JUNE 1988
REYKJAVIK

ANNEX 12

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

OPENING STATEMENT MADE BY THE REPRESENTATIVE OF THE UNITED STATES OF AMERICA

Minister Helgason, Ambassador Forshell, Mr President, Mr Secretary, Representatives, Delegates, Ladies and Gentlemen; it is a pleasure for the delegation from United States of America to participate in the Fifth Annual Meeting of the North Atlantic Salmon Conservation Organization in Reykjavik. There are some of us here today who were present in 1982 when Iceland hosted the Diplomatic Conference which consummated the International Salmon Treaty and led to the creation of NASCO. It is only proper that we now return to Reykjavik on the first occasion that NASCO has convened its annual Meeting outside of Edinburgh, Scotland.

1987 marked the first year that all three Commission areas operated under NASCO regulatory measures. This was a major accomplishment for a young multi-national organization. Now, we must continue in this "spirit of cooperation" to further protect the integrity of our Atlantic salmon stocks.

The United States has increased its human and financial commitment to the restoration and management of salmon. But, it is discouraging for us to see our home water returns continue to exhibit instability. Runs back to our rivers in 1987 were down nearly 40 per cent from 1986 while catch was down more than 50 per cent. U.S. origin salmon continue to be exploited in interception fisheries in numbers greater than returns to our rivers. This makes us painfully aware there is still more to be done to strengthen regulatory measures.

But, as the President remarked in his opening statement, NASCO was formed to do more than just establish annual quotas on fisheries. There are many other conservation issues that need to be addressed, among them the analyses of catch statistics, the effects of farmed salmon on wild stocks, tag return information, the impact of acid rain on salmon resources, and salmonid introductions and transfers. In the future, NASCO will be judged on the entirety of substantive actions it takes towards conserving and managing our salmon, not just the regulation of fisheries.

I anticipate some difficult sessions during the course of this week. I ask the Council and Commissions to address the issues early in these sessions and not wait until the 23rd hour to resolve matters. Iceland has a unique geography and enjoys a unique history, and it would be most auspicious for all of us to have the time and opportunity to learn of our host country's physical, social, and cultural heritage first hand.

In conclusion, Mr President, I wish again to acknowledge the portentous role Iceland has played in the genesis of NASCO. If it were not for your country's commitment to the well being of the Atlantic salmon resource, it is questionable whether we would be here today. I also want to extend the appreciation of my delegation to you for the support you personally provided during the Diplomatic Conference and throughout the first five years of NASCO's existence. You have truly been the leader of NASCO since its inception. Your leadership has been instrumental in establishing the viability of the Organization and, without question, your firm and steady hand has been critical in resolving many of the difficult issues that have faced us during that period. As you step down from the Presidency, you can look back over these few short years and feel extremely proud of the accomplishments made under your leadership. The United States honors you.

13 JUNE 1988
REYKJAVIK

ANNEX 13

CNL (88)43

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION
FIFTH ANNUAL MEETING OF COUNCIL
13-17 JUNE 1988
REYKJAVIK, ICELAND

AGENDA	PAPER NO
1. Opening session	
2. Adoption of the agenda	CNL(88)2 CNL(88)3 CNL(88)4
3. Election of Officers	CNL(88)5
4. Status of ratification of and accessions to the Convention	CNL(88)6
5. Applications for observer status at meetings of the Council	CNL(88)7
6. Coordination of the activities of the regional Commissions	
- Reports of the regional Commissions	
7. Membership of the regional Commissions	CNL(88)8
8. Report on the Headquarters property	CNL(88)9
9. Report of the Finance and Administration Committee	
10. Consideration of the 1987 audited accounts, 1989 draft budget and 1990 forecast budget	CNL(88)10 CNL(88)11 CNL(88)12
11. Agreement with ICES	
12. Scientific research	CNL(88)13 CNL(88)14
13. Scientific and statistical information	CNL(88)15 CNL(88)16
14. Laws, regulations and programmes	CNL(88)17
15. Salmon tagging	CNL(88)18 CNL(88)19 CNL(88)20

16. Report on the policy of the North American Commission on Introductions

17. Potential threats to wild stocks from aquaculture — CNL(88)21

18. Implementation of the Convention — CNL(88)22

19. External relations of the Organization

20. Consideration of a draft report of the activities of the Organization in 1987 — CNL(88)23

21. Other business

22. Date and place of next meeting — CNL(88)24

23. Consideration of draft report of the meeting — CNL(88)30

24. Consideration of press release — CNL(88)31

5 APRIL 1988
EDINBURGH

ANNEX 14

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)6

STATUS OF RATIFICATIONS OF AND ACCESSIONS TO THE CONVENTION

CNL(88)6

STATUS OF RATIFICATIONS OF AND ACCESSIONS TO THE CONVENTION

1. Parties to the Convention as at 1 April 1988 are as follows:

PARTY	DATE OF ACCESSION (A) OR RATIFICATION OR APPROVAL (R)	
CANADA	30 September 1983	(R)
DENMARK in respect of the Faroe Islands	31 January 1983	(R)
in respect of Greenland	17 April 1985	(A)
EUROPEAN ECONOMIC COMMUNITY (EEC)	14 December 1982	(R)
FINLAND	18 May 1984	(A)
ICELAND	21 June 1982	(R)
NORWAY	20 May 1983	(R)
SWEDEN	17 May 1984	(R)
UNITED STATES OF AMERICA (USA)	16 November 1982	(R)
UNION OF SOVIET SOCIALIST REPUBLICS (USSR)	11 September 1986	(A)

2. The Convention entered into force on 1 October 1983, following the deposit of instruments of ratification or approval by the Parties satisfying Article 17, paragraph 5 of the Convention.

15 JUNE 1988
REYKJAVIK

ANNEX 15

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)46

DECISION OF THE COUNCIL TO MODIFY STAFF RULE 8.2

Having regard to the report of the Finance and Administration Committee and to the fact that a pension scheme for NASCO staff has been set up, the Council decides:

- to delete Staff Rule 8.2(b)
- to renumber Staff Rule 8.2(c) as 8.2(b) and to replace the words "more than" with "less than" in this Rule.

15 JUNE 1988
REYKJAVIK

ANNEX 16

FINANCE AND ADMINISTRATION COMMITTEE

PAPER CNL(88)47

1989 BUDGET AND 1990 FORECAST BUDGET

CNL(88)47

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION
1989 BUDGET AND 1990 FORECAST BUDGET (Pounds Sterling)

SECTION	DESCRIPTION	EXPENDITURE	
		BUDGET 1989	FORECAST 1990
1	STAFF RELATED COSTS	104650	110910
2	TRAVEL AND SUBSISTENCE	12470	19210
3	CONTRIBUTION TO ICES	19520	20690
4	CONTRIBUTION TO WORKING CAPITAL FUND	0	0
5	MEETINGS	13920	3310
6	OFFICE SUPPLIES, PRINTING AND TRANSLATIONS	27480	29120
7	COMMUNICATIONS	9110	9640
8	HEADQUARTERS PROPERTY	65990	61650
9	OFFICE FURNITURE AND EQUIPMENT	11650	6710
10	AUDIT AND OTHER EXPENSES	5120	5410
	TOTAL	269910	266650
		REVENUE	
11	CONTRIBUTIONS - CONTRACTING PARTIES	267410	264150
12	MISCELLANEOUS INCOME - INTEREST	2500	2500
13	SURPLUS OR DEFICIT (-) FROM 1987	0	0
	TOTAL	269910	266650

NASCO BUDGET CONTRIBUTIONS FOR 1989 AND FORECAST BUDGET CONTRIBUTIONS FOR 1990 (Pounds sterling)

CATCH (tonnes)	PARTY		1989	FORECAST 1990
1731	CANADA		49030	48432
	DENMARK	(FAROE ISLANDS)		
		(GREENLAND)		
1476		(TOTAL)	43120	42595
2605	EEC		69285	68441
49	FINLAND		10049	9927
220	ICELAND		14012	13841
1389	NORWAY		41104	40603
47	SWEDEN		10003	9881
1	USA		8937	8828
559	USSR		21869	21602
8077	TOTAL		267410	264150

Contributions are based on 1987 catches as advised by the Parties. Column totals can be in error by a few pounds due to rounding.

JUNE 1988
EDINBURGH

ANNEX 17

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

CNL(88)14

SCIENTIFIC ADVICE FROM ICES

THE REPORT OF THE ADVISORY COMMITTEE ON FISHERIES MANAGEMENT (ACFM)

CNL(88)14

REPORT TO THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION COUNCIL

1. INTRODUCTION

Questions of interest to a particular Commission, such as the description of high seas fisheries, appear in the section dealing with questions of interest to that Commission, while all questions dealing with homewater fisheries appear in Section 7. Many of the questions posed related to more than one Commission area, and these are answered separately. In this summary, the tables, figures, and appendices referred to are from the Working Group report (Doc. C.M.1988/Assess:16).

2. CATCHES OF NORTH ATLANTIC SALMON

2.1 Nominal Catches

Nominal catches of salmon by country (in tonnes round fresh weight) for 1961-1987 are presented in Table 1. The catches in homewaters broken down into grilse and salmon are shown in Table 2. Figures for 1987 (6,511 t) are provisional, but it appears likely that, when confirmed, they will show a decrease from 1986 except for Canada and Finland, where they are expected to increase.

Lack of information on fishing effort presents major difficulties in interpreting the catch data.

Unreported catches were considered an important component in stock assessment, and it was agreed that methods of assessing unreported catches should be investigated. Unreported catches were defined as:

> harvests which are caught and retained but do not enter into unreported catch statistics; such harvests could be either legal or illegal but would not include catch-and-release mortalities whether they arise from nets or angling gear. Such estimates would not include fish retained by public agencies for broodstock purposes.

Although some countries could not provide data, the unreported catches for all countries were considered to be of the order of 3,000t, which is 500t less than the corresponding amount for 1986.

ACFM notes with concern the importance of non-reported catches, and urges participants to continue to make every possible effort to obtain and contribute such data in accordance with normal ICES procedure.

2.2 Catches in Numbers by Sea Age and Weight

Reported national data from several countries are summarized in Table 3. In most countries, the decline in the reported 1987 homewater catches occurred in both the 1-sea-winter (1SW) and multi-sea winter (MSW) age groups.

3. FRAMEWORKFORSCIENTIFICADVICEONMANAGEMENTOFSALMON

3.1 Introduction

NASCO asked ICES to discuss scientifically-based approaches for managing salmon in the context of existing fisheries.

There are two aspects to this subject: firstly, to establish a practical management strategy, and secondly, to describe a possible scientific approach to provide supporting advice. The Working Group recognized three principal aims in the management of Atlantic salmon: conservation of stocks, optimization of yields, and minimization of the variability of the yield from each fishery.

Conservation can best be achieved by controlling fishing mortality to ensure an adequate number of spawners in each river system to optimize production each year, and this must be the first priority of salmon management.

It is likely to be difficult to optimize yields in mixed-stock fisheries because individual stocks or stock complexes will vary in their availability to the fisheries. The stocks or stock complexes having the largest proportion of their extant numbers available to the fishery will experience the highest exploitation rates and must, therefore, be the key to optimising exploitation in the fishery. The varying relative productivity of the stocks or stock complexes further adds to the difficulties of managing mixed-stock fisheries.

Wide annual variation in the yield in each fishery may have socio-economic implications that must be considered.

It is fundamental to rational management that scientists estimate a target number of spawners of each sea age or stock component which should be attained each year. This number can be converted into a target "spawning biomass" using appropriate mean weights.

Management strategy should either:

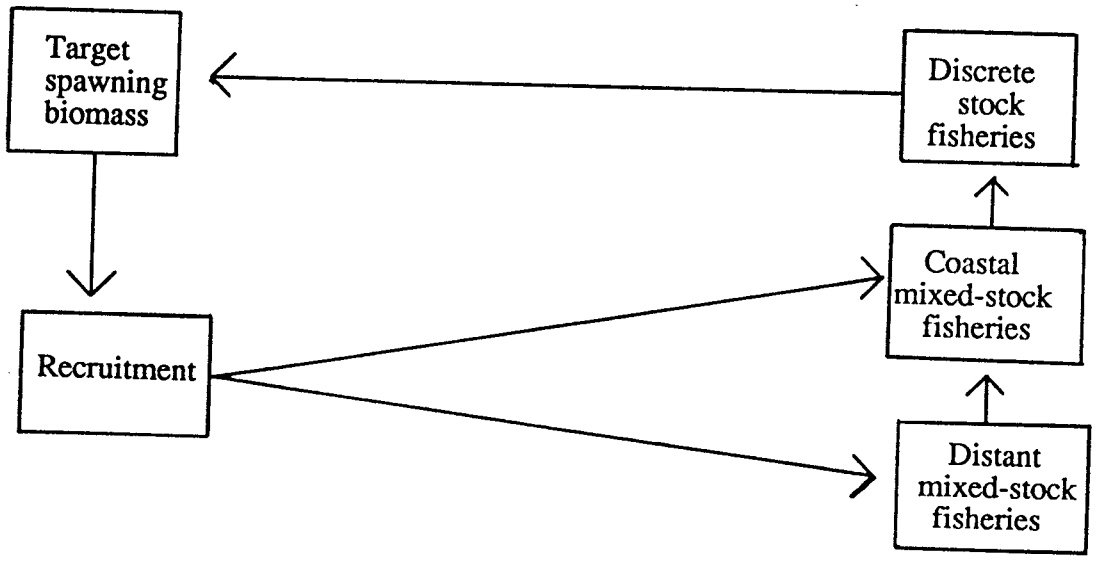
1) permit annual adjustments to harvest levels in all fisheries, or

2) fix the combined harvest of all fisheries at a level sufficiently low to achieve the target spawning biomass of each stock component within normal variations in production, or

3) fix the harvest in mixed-stock fisheries at a level sufficiently low to allow final adjustments to the spawning escapement of each stock component in or close to the river of origin.

3.2 A Conceptual Framework

The diagram below illustrates the type of relationship that could exist between fisheries that must be managed in order to achieve target spawning biomass.



Several models are available which, given sufficient data, can be used to estimate target spawning biomass or production and to assess the effects of varying fishing mortality in one fishery on the harvest in other fisheries and on spawning biomass (see Section 3.6)

3.3 Techniques to Attain Target Spawning Biomass

The ideal system for managing salmon would be to forecast the abundance of all stocks prior to the start of the fisheries each year and then allocate catches to the fisheries on the basis of the distribution of the fish and target spawning escapement.

Existing salmon fisheries cannot be managed within such an ideal framework. Two approaches were discussed which could be used to achieve sufficient spawning escapement for some stock complexes.

A. Real-time management of fisheries

This method utilizes information on stock abundance, either before the fishery commences or while it is in progress. This information is used to close or regulate mixed-stock or discrete fisheries if the abundance of selected stocks or stock components is equal to or less than a predefined target. The method requires:

a) estimates of salmon abundance during the fisheries;

b) techniques to identify stocks;

c) models for estimating the impact of management measures on the predefined abundance targets;

d) enforcement mechanisms for implementation of management measures.

B. Management based on historical performance of the fisheries

This management strategy is one most commonly used at present. The major difficulty with it is that it only reacts to conservation and fishery problems after they occur and operates by trial and error. The method requires:

a) historical data on spawning escapements for a number of stocks;

b) data by stock or stock complex on the contribution to mixed-stock fisheries.

3.4 Proposed Approach to Management

The primary goal of management to ensure target spawning biomass can be achieved by setting harvests in mixed-stock fisheries at a level which would ensure that the number of salmon returning to the vicinity of the river of origin each year is greater than that required for spawning. Adjustments would then be made to fisheries in or near the rivers to ensure that target spawning biomass is attained.

It is not feasible to develop a management strategy or assess its effectiveness by determining the spawning biomass or the fishing mortality of all stocks. Annual assessments and calculations of these parameters should be made on "indicator stocks". An "indicator stock" may be an individual stock or a group of stocks which can represent the stocks in a larger geographic area. For "indicator stocks", it will be necessary to annually estimate the spawning escapement, the fishing mortality in the various fisheries, and the abundance of salmon returning to discrete stock fisheries.

3.5 Estimation of Target Spawning Biomass and Production

There are several approaches which can be used to estimate target spawning biomass when its is not possible to directly obtain reliable figures. One approach would be to apply estimates of densities at various life stages, or adult production from stocks which have similar biological characteristics, i.e. use values from "indicator stocks". Another approach would be to use values from the scientific literature.

3.6 Fisheries Model

Models could be developed for salmon stocks for which sufficient data exist. Eventually these individual models could be linked in order to develop a cohesive picture of interactions among fisheries and used to judge the effectiveness of management measures.

3.6.1 Spreadsheet system

A spreadsheet system available at ICES Headquarters was used by the Working Group to implement a preliminary descriptive salmon model, using standard measures of catches and abundance, traps, tag recaptures, etc. to develop most, but not all, of the necessary parameters for the model.

The model calculates the abundance and catches in each time step; all fish available in the previous time period are accounted for. Examples are shown in Tables 4 and 5 and in Figures 1 and 2.

3.6.2 Fisheries models for selected stocks

The Working Group also examined two conceptual approaches to reducing exploitation on selected salmon stocks. The first, real-time management, is discussed in Section 3.3 above. The second, linear programming, was used to develop time and area closures which minimizes interceptions in mixed-stock fisheries. By adjusting the necessary constraints, the model can provide an objective standard against which management measures can be evaluated.

3.7 Summary

These models are preliminary and may not be available in the immediate future, but, nevertheless, they are the first steps in such descriptions of salmon fisheries in the North Atlantic. The marine life history model is not predictive, but given the appropriate parameter sets, it can provide a descriptive view of the interactions of the various fisheries and spawning escapements.

3.8 ACFM Comments

ACFM notes and commends the constructive discussion on scientifically-based approaches for managing salmon. The Working Group cannot, however, be expected to select overall objectives of management, since this involves the resolution of social and political conflicts, which are beyond its competence. ACFM, therefore, suggests that the Working Group should continue to develop methods for evaluating the consequences (in terms of yield, stocks size, etc.) of management options involving modest changes in the level of exploitation in the main fishery sectors. NASCO should consider how it could make use of such assessments in choosing among such management options, taking into account the biological importance of spawning stock, as discussed by the Working Group.

ACFM also notes the research priorities listed in Section 9 of the Working Group report, which reflect the proposed approach to scientific management, and the data requirements given in Appendix 5 of the Working Group Report. ACFM requests that countries make every effort to initiate such research and obtain and contribute

such data at future meetings of the North Atlantic Salmon Working Group.

4. QUESTIONS OF INTEREST TO THE WEST GREENLAND COMMISSION OF NASCO

4.1 The Fisheries in 1987

The fishery at West Greenland is described below, and the fisheries in homewaters are described in Section 7.

4.1.1 Description of the fishery at West Greenland

The fishery opened on 25 August and ended on 7 October. The agreed TAC was 850t, adjusted to 935t for the opening date of 25 August. The nominal catch was 966t, exceeding the quota by 31t.

The TAC was divided into a "free quota" of 533t available to all licensed fishermen and a "small-boat quota" of 356t for boats less than 30 feet, which was allocated to districts. The remaining 46t was reserved for a longline fishery and as a buffer for the total fishery. The "free quota" catch was 614t and exceeded the quota by 81t.

In total, 77% or 744t was taken by boats smaller than 30 feet operating in the inshore area, and logbooks indicate that a great part of the catches taken by larger boats was from the inshore area.

In 1987, the greatest landings were recorded in NAFO Divisions 1C-1E, which differs from 1986 when the highest divisional catch was taken in Division 1F.

The bulk of the catch is taken with drift nets which have a target mesh size of 140mm stretched. On average, the small boats used 40 nets, each 25m long, per fishing day while the bigger boats used an average of 99 nets per day. Compared with procedures formerly used by the big drifters, the fishermen now patrol their nets more frequently to remove salmon and, in most cases, nets are cleared before the gear is hauled. This should have reduced non-catch fishing mortality.

Of the 350 boats supplied with logbooks, 60 boats provided effort and catch information (Table 8). The figures from 1986 are updated in Table 9. The information available is limited but shows that catch per unit of effort was lower in 1987 than in 1986.

During the first 7 days and the first 14 days of the fishery, the landings were lower than in 1986, which may indicate that salmon were less available to the fishery in 1987.

4.1.2. Composition and origin of catch

In 1987, samples of salmon (678 North American and 678 European) caught between 1980 and 1986 were used to develop a data base for discriminating salmon at West Greenland. One character previously used to develop the discriminant function had to be excluded in 1987. The samples caught at West Greenland in 1987 identified to continent of origin by the presence of a tag or by protein electrophoresis indicated a misclassification rate of 18.6 and an error rate of + 4.0.

Applying the discriminant function to catch samples at West Greenland gave an estimated proportion of 59% North American or a corresponding catch of 556t (179,918 salmon) and 41% European or a corresponding catch of 411t (126,395 salmon).

The proportion of North American fish ranged from 47% in Division 1F to 68% in

Division 1D.

The number of Maine-origin salmon by statistical area caught at West Greenland in 1967-1986 is shown in Table 12. Since the imposition of a quota in 1976, the catch has averaged about 1,460 salmon.

In 1987, 146 fish tagged with coded-wire tags (CWTs) were recovered out of 25,047 salmon (8.2% of the catch) examined. The tags (see Table 14) originated in five countries: Scotland 2 (1%), England and Wales 17 (12%), Canada 21 (14%), Ireland 24 (16%), and USA 82 (56%).

Valid estimates of harvest can be derived at the tag scanning levels being achieved following the methods developed for external tags (Anon., 1986a).

Comparisons of continent or origin identifications made by examining the levels of mito-chondrial DNA polymorphism among Atlantic salmon stocks were in agreement with those derived from electrophoretic techniques.

Image processing techniques for stock identification, utilizing scales or otoliths, have yielded encouraging preliminary results but require further research.

4.1.3. Biological characteristics

The results of the discriminant function analysis were used to divide samples in NAFO Divisions 1B and 1D-F into North American and European components. As previously observed, the North American 1SW salmon were significantly shorter and lighter than their European counterparts. The sea and smolt age composition of samples are summarized in Tables 16a, 16b, and 17. The mean smolt age of 2.8 years observed in the samples of North American origin is similar to the 1986 value of 2.86 years. The mean smolt age of 2.02 years observed in samples of European origin is slightly higher than that observed in 1986 (1.98).

The sea age compositions in 1987 (Table 16a and 16b) were 97.0%, 2.0%, and 1%, of 1SW, 2SW salmon, and previous spawners, respectively.

4.1.4. Stock abundance and exploitation

In 1987, an improved technique based on estimates of run size and harvest of Maine-origin salmon was used to develop preliminary estimates of the exploitation rate and population size of 1SW salmon at West Greenland. A limitation of the previous model was that it assumed that all fish returning to Maine rivers were available for exploitation in the Greenland summer fishery. Simulations using the modified model suggested that exploitation rates in 1986 had probably increased and that population size had decreased in West Greenland compared with 1985 values, but the magnitude could not be quantified. This inference from the model is not consistent with the apparent high abundance in the 1986 fishery as assessed by the catch levels in the first two weeks of the season as well as by the CPUE data. Low catch rates of 2SW salmon in some Canadian and USA rivers, however, did support the model simulation.

4.2 Accuracy of Age Determination of Hatchery-Origin Salmon at West Greenland

Estimates of the harvest of USA fish at West Greenland derived from the "proportional harvest method" (Anon., 1986b) were about four times higher than estimates from a model based on Carlin-tag recoveries. The method was sensitive to the proportion of the harvest of North American fish estimated to be river age 1, and the accuracy of these estimates was investigated. The Working Group concluded that the river age of salmon of North American origin could be determined without undue bias.

4.3 Effectiveness of Management Measures in the Fishery at West Greenland

Prior to 1984, the quota for the West Greenland salmon fishery for many years was 1,190t (or its equivalent adjusted by season opening date). Since 1984, the quota has been lower, and for 1986 and 1987 it was set to be equivalent to 850t in terms of numbers of fish if the season had opened on 1 August.

The Working Group concluded that significant reductions have taken place in both the average quota (lower by 26%) and the total weight of harvest (lower by 21%) for the years 1985-1987 compared to 1978-1982 (Table 18). Total harvest in Greenland averaged 308,000 during recent years, which is about 58,000 fish less than when the quota was 1,190t.

5. QUESTIONS OF INTEREST TO THE NORTH-EAST ATLANTIC COMMISSION OF NASCO

5.1 The Fisheries in the 1986/1987 Season, and in 1987

The fishery at Faroes is described below, and descriptions of homewater fisheries are given in Section 7.

5.1.1. Description of the fishery at Faroes

The landings in 1987 amounted to 510t, which was 20t less than in 1986 (Table 19, which is a corrected version of previous tables). The nominal landings by seasons broken down into numbers and weight by sea-age group are given in Table 3. Catch in number by statistical rectangle for the 1986/1987 season is presented in Figure 3. The number of discards was estimated to be 7.4% of the catch.

5.1.2. Fishing effort

The average CPUE in the 1986/1987 season was the highest annual figure recorded (Figure 4 and Table 20).

5.1.3. Origin of salmon in the Faroese fishery

In 1987, tagging data from external and coded-wire tags indicated that the recapture rates per 1,000 fish tagged have decreased in Scotland, Ireland, Iceland, and England/Wales. It was noted that tags from the USSR have been found in the fishery.

As in 1986, the number of recoveries of Norwegian Carlin tags relative to the number released indicated that salmon of Norwegian origin are by far the largest component of the Faroese fishery.

5.1.4. Abundance and exploitation

Data from the River Imsa tagging experiments indicate that the exploitation of this stock in the Faroese area in the 1986/1987 season was similar to previous years (Tables 23 and 24). Estimates of the exploitation rate on the extant stock range from 0-4% on 1SW salmon and 13-63% on 2SW salmon.

5.2 Effort Control in the Faroese Fishery

Catch limitation (quota) should provide a constant fishing mortality if recruitment remains constant, while effort control might stabilize the fishing mortality if the proportion of the extant stock available to the fishery remains constant. It was not possible, however, to evaluate the relative effects of effort and quota control on fishing mortality in the Faroese fishery zone.

5.3 Contribution of Hatchery-Reared Salmon and Fish Farm Escapees to the Salmon Fishery

Based on scale samples from the Faroese fishery in the 1986/1987 season, 2.6-3.6% of the fish were classified as hatchery reared. The range estimated from samples presented in 1987 was 0-13%.

5.4 Acoustic Survey at the Faroes

A feasibility study on the use of acoustic techniques to estimate the numbers of salmon in the Faroes fishery zone is to be carried out in February or April 1989. The Marine Laboratory in Aberdeen (Scotland) and the Marine Research Institute in Bergen (Norway) have agreed to supply acoustic experts to take part in the experiments and assist with data analysis. The equipment and research vessel will be made available by the Faroese Laboratory.

5.5 Effectiveness of Management Measures in the Faroese Fishery

Since 1987 was the first year of effort control, it is not yet possible to assess the effect of this measure on either the Faroese or homewater fisheries.

5.6 Recommendations

ACFM endorses the recommendations of the Study Group on the Norwegian Sea and Faroese Salmon Fishery given in Appendix 4 of the Working Group report.

6. QUESTIONS OF INTEREST TO THE NORTH AMERICAN COMMISSION OF NASCO

6.1 The Fisheries in 1987

The fisheries in Canada and USA are described under homewater fisheries in Sections 7.1 and 7.11.

6.2 Effectiveness of Management Measures

6.2.1 USA

In 1987, a mandatory registration system for all salmon >64cm in total length caught by anglers was instituted. This is expected to improve the reporting rate for salmon taken in the Maine sport fishery. The management measures initiated in 1985 (Anon., 1987b) are still in effect and have achieved a 50% reduction in the exploitation rate of MSW salmon in the Penobscot River.

6.2.2 Canada

The management measures imposed in Canada in 1984 and 1985 were described in Anon. (1986a and 1987b). Preliminary 1987 figures suggest that the complete closure of some fisheries resulted in a decrease in harvest of 258t of MSW and 25t of 1SW salmon. The delayed opening of the season reduced the 1987 catch by 92t of MSW and 7t of 1SW salmon.

In 1987, legislation requiring market tagging of salmon in the Newfoundland/Labrador commercial fishery came into effect. No information was presented to quantify the impact of this.

6.2.3 Effect of Canadian management measures on USA stocks

It is noted (Anon., 1987b) that area closures and season reductions for 1984 and 1985 should have resulted in an 11% reduction in the harvest of Maine-origin

salmon. The closure of the autumn fishery on 15 October 1986 should account for 29% of the 1SW Maine-origin salmon caught in the Newfoundland/Labrador fisheries. The percentages are not additive, however.

The number of Penobscot River MSW fish considered to be both available and vulnerable to distant commercial fisheries in 1986 was 2.5 times more than the average for 1981-1986. Although based on only a single observation, results are consistent with the objective of the management measure which closed the Newfoundland fall fishery.

To assess the combined effect of all measures taken by Canada for 1984-1986, the estimated harvest of 1SW Maine-origin salmon in Newfoundland/Labrador was compared to the Maine run size of 2SW salmon the following year. For the years 1967-1983, the ratio of Newfoundland harvest to homewater run size averaged 0.53, while the value for 1984-1986 was 0.35 (Table 30). The reduced harvest in Newfoundland is consistent with the expected impact of the closure of the fall fishery by Canada in 1986.
Tag recovery information from the provinces of New Brunswick, Nova Scotia, and Quebec should be examined next year to provide a more complete analysis of the impact of these management measures.

6.3 Numbers of Salmon of USA Origin in Canadian Fisheries

6.3.1. Historical catches in Newfoundland/Labrador commercial fisheries by 1 SW salmon which originated in USA

Revised harvest estimates by year and standard week are given in Table 32 and an annual summary in Table 33. The estimates are derived using the same parameters as in 1987 (Anon., 1987b) and the most up-to-date information on tagged and untagged 2SW salmon returning to Maine rivers. The overall change in the estimates across all years is only 0.3%.

The estimated harvest of Maine-origin salmon in Newfoundland and Labrador during 1986 was substantially lower for recent years (Table 33). The higher proportion of harvest in Area 0 and a lower proportion in Area B, compared to previous years, is consistent with the closure of the fall fishery.

An estimated 254 1SW salmon of Connecticut River origin were harvested in Newfoundland/Labrador in 1986 compared to an estimated 649 1SW fish in 1985.

6.3.2. Historical tag recoveries of 1SW and MSW salmon of USA origin in provinces of Quebec, Nova Scotia, and New Brunswick and MSW salmon in Newfoundland/Labrador

Additional information on the annual capture of 1SW and MSW Maine-origin salmon in the commercial fisheries of Quebec, New Brunswick, and Nova Scotia is provided for the period 1963-1987 in Tables 35 and 36. Similarly, new information was provided summarizing the annual capture of tagged MSW salmon of Maine origin in Newfoundland/Labrador fisheries (Table 37). Tag recovery information from these areas should be re-examined in the future in order to provide improved estimates of the impact of management measures.

ACFM notes that this is a recommendation of the Study Group on the North American Salmon Fishery in Appendix 4 of the Working Group report, which ACFM endorses.

6.3.3. Average percentage by number of USA fish in the total harvest of the Newfoundland/Labrador commercial fishery

The average percentage of Maine-origin fish in the total harvest of the

Newfoundland/Labrador commercial fishery during the years 1974-1986 (excluding 1979) is presented in Table 38.

6.4 Review of the Report of the Study Group on Acid Rain

6.4.1. Freshwater habitats of Atlantic salmon populations and their vulnerability to acidification

There are nearly 1,000 km of accessible Atlantic salmon rearing habitat in Eastern North America, of which 50 km were classed as vulnerable (on the previous criterion of <50 eq/l mean alkalinity) (Anon. 1987a). Upon further examination, this estimate has now been increased from 50 to 108 km . The minimum standard for vulnerability has been revised to meet one of the following criteria: a) a mean value of 75 eq/l or less (derived from at least eight measurements which include seasonal changes and a realistic change of water flows; or b) when sampling has been or must be limited, a value of 150 eq/l or less, derived from consistent measurements of low summer flows, preferably repeated over a 5-year period as an acceptable approximation of a) above.

The additional area of vulnerable habitat gained by applying new higher alkalinity criteria has not yet been estimated.

For Nova Scotia, the amount of habitat lost as a result of acidification has been revised from 10.3 km to the more conservative value of 6.0 km.

The Study Group revised the production loss due to acidification in the Southern Upland of Nova Scotia (Watt, 1986). The Study Group was concerned about the robustness of the new estimate due to unexplained sensitivity of the estimate of production per unit habitat. The revised estimated loss of Atlantic salmon annual production due to acidification since 1980 has been conservatively estimated to be about 5,600 fish/year.

Following the 1987 advice of the North Atlantic Salmon Working Group (Anon., 1987a), an alternative method of estimating Atlantic salmon production loss was attempted, based on a relationship between pre-smolt production and pH. This method indicated a substantial decline in Atlantic salmon production, but was judged to be insufficiently developed at present.

6.4.2 Trends in acidification of habitat and in the fish populations

No new information on annual or seasonal trends in acidification was reported to the Study Group, and so the 1987 conclusions remained unchanged (Anon., 1987c).

The only historic water chemistry data available was from the Southern Upland region of Nova Scotia, and this revealed that, in at least four rivers during the period 1955-1981, acidity had increased.

Angling catch records for 22 rivers in the Southern Upland zone provide evidence that the Atlantic salmon harvest has declined from 1936 to the present.

6.4.3. Influence of acidification on growth and survival of Atlantic salmon

While the Working Group noted that low pH seems not to affect growth rates, increased acidity (lowered pH) can lead to mortality in several stages of the salmon's life cycle; alevins are particularly vulnerable at hatching and transition to first feeding, while the water-hardened egg is relatively resistent to low pH. Mortality can also occur in parr and smolts if the pH is rapidly reduced.

If pH falls to 4.7, juvenile production will tend to fall below the lower limit for maintenance of the population. Production stays below carrying capacity at more moderate pH levels up to about 5.6. It is also apparent that low pH levels will drastically limit reproductive success to the point where a stock may disappear before food supplies are themselves impoverished.

6.4.4 The effectiveness of mitigation measures

The only satisfactory permanent solution to the problem of acidification of Atlantic salmon habitat would be the elimination of the source of acidity.

Feasible short-term mitigation measures are liming, stocking, and the preservation of genetically diverse stocks. Liming has been used successfully in Europe and North America. Hatchery-reared stocks are most useful in situations where production declines are not yet severe. Preservation of the gene pool and selection of acid-resistant stocks require further research and development before implementation would be practical.

6.4.5 Recommendations

ACFM endorses the recommendations of the Study Group on Acid Rain (Appendix 4 of the Working Group report).

7. HOMEWATER FISHERIES

Section 7 of the Working Group report describes the various homewater fisheries.

The information from most countries allows a description of the fishery according to the various types of gear, contribution of fish from other countries, and status of stocks. Some countries were able to provide exploitation rates in some fisheries.

Effectiveness of management measures is commented on for most countries. For Canada, this is dealt with specifically in Section 6.2 above.

It is envisaged that the information in this section could be helpful in building a descriptive model of salmon in the North Atlantic.

8. GENERAL TASKS

8.1 Compilation of tag data

NASCO requested ICES to compile information on tagging carried out on Atlantic salmon.

8.1.1 Compilation of tag release data for 1987

About 1.2 million microtags and 0.4 million external tags were applied to Atlantic salmon in 1987 (Table 43). In addition, 1.3 million salmon were finclipped. Thus, more than 2.9 million fish were marked.

The Working Group prepared a separate report on salmon tagged or marked in 1987.

8.1.2 Tagging data base

ACFM notes the progress made by the Working Group in assembling tagging data, and endorses the Working Group's conclusion that there is no need for NASCO to develop a tagging data base as long as the Working Group can continue to provide this service.

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ANNEX 18

NORTH ATLANTIC SALMON CONSERVATIN ORGANIZATION

COUNCIL

PAPER CNL(88)48

DECISION OF THE COUNCIL TO REQUEST SCIENTIFIC ADVICE FROM ICES

CNL(88)48

DECISION OF THE COUNCIL TO REQUEST SCIENTIFIC ADVICE FROM ICES

The Council decides to request the following scientific advice from ICES:

1) With respect to Atlantic salmon in the West Greenland Commission area:

   (a) describe events of the 1988 fisheries with respect to gear, effort, exploitation rate, composition and origin of the catch, and assess the status of the stocks;

   (b) evaluate the effectiveness of new, existing, or proposed management measures for home waters and interception fisheries on stocks occurring in the Commission area;

   (c) continue the development of models to describe the fishery interactions and stock dynamics in order to estimate the effects of management measures;

   (d) specify data deficiencies and research needs.

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

   (a) describe events of the 1988 fisheries with respect to gear, effort, exploitation rate, composition and origin of the catch, and assess the status of the stocks;

   (b) evaluate the effectiveness of new, existing, or proposed management measures for home waters and interception fisheries on stocks occurring in the Commission area;

   (c) continue the development of models to describe the fishery interactions and stock dynamics in order to estimate the effects of management measures;

   (d) with respect to the issue of acidification:

      (i) provide estimates of the number of salmon lost due to acidification in the North-East Atlantic Commission Area;

      (ii) describe the effectiveness of mitigation measures and the extent to which the measures are in current use;

   (e) specify data deficiences and research needs.

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

   (a) describe events of the 1988 fisheries with respect to gear, effort, exploitation rate, composition and origin of the catch, and assess the status of the stocks;

   (b) evaluate the effectiveness of new, existing, or proposed management measures for home waters and interception fisheries on stocks occurring in the Commission area;

(c) continue the development of models to describe the fishery interactions and stock dynamics in order to estimate the effects of management measures;

(d) specify data deficiencies and research needs;

(e) if new information is available, provide estimates of the amount of salmon habitat available, areas vulnerable to acidification, areas lost to production and the number of salmon lost due to acidification.

(f) NASCO has decided to implement a trial voluntary 4 year lottery reward system to encourage the return of external tags. This system is to be implemented beginning in 1989. What are the effects this reward system may have on the rate of return of these tags and how might this improve or otherwise affect the scientific analyses or the development of scientific advice.

ANNEX 19

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)15

CATCH STATISTIC RETURNS BY THE PARTIES (TABLES 1 AND 2)

TABLE 1: OFFICIAL CATCH STATISTICS

	PROVISIONAL 1987 CATCH (TONNES)	PROVISIONAL 1987 CATCH ACCORDING TO SEA AGE						CONFIRMED 1986 CATCH (TONNES)
		1SW		MSW		TOTAL		
		NO.	WT	NO.	WT	NO.	WT	
CANADA	**1731**	423698	815	193168	916	616866	1731	1559
DENMARK (In respect of Faroe Islands and Greenland)	**1476**							1490
FAROE ISLANDS*	**510**	76	--	140228	--	140304	520	530
GREENLAND	**966**	306313	966	--	--	306313	966	960
EUROPEAN ECONOMIC COMMUNITY	**2604.8**	--	1595	--	628	512969	2604.8	3524
FINLAND	**49**	--	--	--	--	--	--	38
ICELAND	**220**	30000	72	32000	148	62000	220	330
NORWAY	**1389**	--	--	--	--	--	--	1597
SWEDEN	**46.7**	--	--	--	--	12916	--	53.2
UNION OF SOVIET SOCIALIST REPUBLICS	**559.4**	--	--	--	--	--	--	607.7
UNITED STATES OF AMERICA	**1.1**	29	--	227	1.1	256	1.1	1.9

*** The breakdown of the Faroese catch according to sea-age is for the 1986/87 season catch of 520 tonnes.**

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

TABLE 2: CATCHES OF ATLANTIC SALMON BY THE PARTIES TO THE NASCO CONVENTION

	CANADA	DENMARK*	EEC	FINLAND	ICELAND	NORWAY	SWEDEN	USA	USSR
1960	1636	60	2676		100	1576	40	2	1100
1961	1583	127	2342		127	1456	27	2	790
1962	1719	244	3948		125	1838	45	2	710
1963	1861	466	3862		145	1697	23	2	480
1964	2069	1539	4290		135	2040	36	2	590
1965	2116	861	3696		133	1900	40	2	590
1966	2369	1338	3611		106	1823	36	2	570
1967	2863	1600	4540		146	2058	25	2	883
1968	2111	1167	3645		162	1752	150	2	827
1969	2202	2350	4420		133	2083	76	2	360
1970	2323	2354	4036		195	1861	52	2	448
1971	1992	2511	3802		204	1847	35	2	417
1972	1759	2146	4187	32	250	1976	38	2	462
1973	2434	2402	4538	50	256	2126	73	3	772
1974	2539	1945	4339	76	225	1973	57	1	709
1975	2485	2086	4413	76	266	1754	56	2	811
1976	2506	1479	2901	66	225	1530	45	1	
1977	2545	1652	2977	59	230	1488	10	2	
1978	1545	1159	3070	37	291	1050	10	4	
1979	1287	1694	2542	26	225	1831	12	3	430
1980	2680	2052	2593	34	249	1830	17	6	631
1981	2437	2602	2532	44	163	1656	26	6	450
1982	1798	2609	2523	83	147	1348	25	6	311
1983	1424	1433	3512	78	198	1550	28	1	436
1984	1112	997	2290	73	159	1623	40	2	593
1985	1133	1430	2989	49	217	1561	45	2	652
1986	1559	1490	3568	38	330	1598	54	2	608
1987	1731	1476	2515	49	220	1389	47	1	559

NOTES: * In respect of Faroe Islands & Greenland

1. The EEC catch consists of the sum of the catches of the present members of the Community for which data are available.

2. The catch for Denmark in respect of the Faroe Islands and Greenland includes the catch for Greenland when it was a member of the European Community and the catches up to 1983 by Denmark.

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ANNEX 20

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)36

DRAFT RETURN OF OFFICIAL CATCH STATISTICS CALENDAR YEAR :

(1) Provisional catch of Atlantic salmon, in tonnes round fresh weight or round fresh weight equivalent.

(2) If available, provisional catch of Atlantic salmon in numbers and weight (round fresh weight or round fresh weight equivalent) according to sea-age.

(3) Confirmed catch of Atlantic salmon in tonnes round fresh weight or round fresh weight equivalent for previous calendar year.

Notes

1. "Round fresh weight" means weight of whole, ungutted, unfrozen fish.

2. "Provisional" means latest available data (which may be subject to revisions) for calendar year ended.

3. "Confirmed" includes any revision to the provisional figure previously given.

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ANNEX 21

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)39

DECISION OF THE COUNCIL ON THE ESTABLISHMENT OF A NASCO LOTTERY FOR TAG RETURNS

The Council, having regard to paper CNL(88)20 on a NASCO lottery for tag returns, and to the desirability of encouraging and improving the return of tags and recapture information, decides:

- 1. that the Secretary shall establish a NASCO lottery for tag returns for a trial period of four years to apply to tag returns for the calendar years 1989-92.

- 2. that participation by Parties in the lottery should be on a voluntary basis.

- 3. to establish a special fund under Financial Rule 7.2 for the purpose of funding the lottery.

- 4. that the following rewards (in US dollars) shall be offered in each NASCO Commission area:

First award	$1500
Second award	$1000
Third award	$ 500
Seven awards	$ 100

- 5. that there be a grand award of $2500 for which any tag could be eligible.

- 6. to accept the proposal by the United States to fund the lottery for the trial period.

NOTE: This lottery will only apply to individually identifiable external tags which are returned in each calendar year.

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ANNEX 22

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)28

SYNOPSIS OF ACTIVITIES TO DATE OF THE NORTH AMERICAN COMMISSION'S BILATERAL SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

PAPER CNL(88)28

SYNOPSIS OF ACTIVITIES TO DATE OF THE NORTH AMERICAN COMMISSION'S BILATERAL SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

Upon the request of the North American Commission of NASCO, the following is presented as a review of our activities to date:

At the May 1984 meeting of the North American Commission of the North Atlantic Salmon Conservation Organization (NASCO) in Ottawa, Mr D Goldthwaite (USA) and Dr G I Pritchard (Canada) were appointed to pursue the establishment of a bilateral scientific working group to examine and develop recommendations for the consideration of the Commission at its next 1985 meeting on the following matters:

1. The potential for adverse impacts on Atlantic salmon stocks resulting from the introduction of Pacific salmonids in the Great Lakes and along the Atlantic coast of North America and ways of minimizing such impact, if noted.

2. Options for protecting the genetic integrity of Atlantic salmon populations including the possible development of protocols for movement or transplants of stocks.

3. The feasibility of and possible ways for achieving more closely aligned fish health programs.

A report was produced and submitted to the North American Commission in May 1985.

As a result of the June 1986 meeting of the Commission, a Bilateral Scientific Working Group (hereafter referred as the Group) was established. The initial membership to the Group consisted of: D Goldthwaite, US Fish and Wildlife Service (US Chairman); T Spurr, Fish and Game Department, New Hampshire, USA; R Porter, Department of Fisheries and Oceans (DFO), Canada (Canadian Chairman); G Turner, DFO Canada; T Carey, DFO Canada.

Terms of Reference for the Group were established. Underlying this listing was the overall charge to develop guidance that is directed toward protecting the Atlantic salmon resource from adverse impacts of importations and transfers of salmonids.

The Group was requested to provide a Progress Report, for the February 1987 meeting of NAC, to address the following items:

1. Thorough review of the previous report (Report of NASCO Scientific Group, 1985) - Introductions of New Salmonids on the Atlantic Seaboard- referenced above.

2. A review of all non-indigenous salmonid introductions (undertaken in 1986 or proposed for 1987) in relation to International Council for the Exploration of the Sea (ICES), revised Code of Practice (Terms of Reference No. 2) and development of an inventory (Terms of Reference No. 4).

A completed report (Annex 13 to NAC(87)20) was presented to and approved by the Commission at the June 1987 meeting of NASCO in Edinburgh. The report provides information which demonstrated that there was the potential for risk of detrimental effects that would result from introduction and transfers of salmonids to the Commission area. In relation to Atlantic salmon populations, these risks are associated with fish health, genetics and ecological interactions. An integral part

of that report was a Summary of Recommendations. Included in the listing of recommendations were three items of special interest that were immediately acted upon by the Commission (see NAC(88)11): acceptance of revisions to the Terms of Reference (attached), a Declaration of Policy and an Action Plan.

In response to the first of these (Terms of Reference), the inventory of introductions and transfers was expanded to cover all such matters in the Commission area since 1975. Such a change has been instituted and reports developed and analyzed for conformance to ICES Code of Practice and compliance with recommendations made to NAC by the Group (referenced above).

The majority of Group activities since the 1987 NASCO meeting have concentrated on the establishment of institutional arrangements commensurate with the Action Plan. We now have two Subgroups (Fish Health and Genetics) in place that have been provided with their own Terms of Reference and are independently developing protocols that will provide guidance when importing or transferring stocks or strains of fish into or within the Commission area. During these deliberations, these groups are making maximum use of protocols and/or model programs that are already in existence. For example, the Model Fish Health Program of the Great Lakes Fishery Commission, the ICES Code of Practice, the EIFAC Code of Practice, the American Fisheries Society's Position on Introductions of Aquatic Species, the Colorado River Fish Health Cooperative's Guidelines, the New England Salmonid Fish Health Policy, and others have been and are being utilized, where appropriate, in development of these new protocols.

An additional subgroup has been established to address the issues related to ecological interactions in the wild. It will develop draft protocols as well. At this point, it is a smaller group composed of two Canadian members, but will expand as the drafted material is reviewed.

Ultimately, these three draft protocols will be developed into final draft form (by the end of December 1988) and will be provided to the Group who will then combine them into an overall set of protocols or a model program to be completed for Commission approval at the June 1989 NASCO Meeting. This would then serve as guidance for the various regulatory agencies as they develop legislation to deal with introductions and transfers in a biologically sound manner.

Co-Chairmen
Bilateral Scientific Working Group

TERMS OF REFERENCE
FOR NASCO
NAC BILATERAL SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

1. Provide advice and comments to NASCO-NAC on matters related to the potential impact (genetic, ecological or pathological) on "native" Atlantic salmon stocks of eastern Canada and the United States resulting from proposed introductions or transfer of any salmonid to these areas.

2. Review all non-indigenous salmonid introductions in relation to the ICES/EIFAC "codes of practice to reduce the risks of adverse effects arising from introduction of non-indigenous species".

3. Review and develop, mechanisms and protocols related to the introduction or transfer of salmonids into the waters of eastern Canada and/or the United States with respect to their potential impacts on native salmonids.

4. Maintain an inventory of all approved introductions and transfers of all salmonids into Lake Ontario and the Atlantic coast of North America since 1975.

5. Establish and maintain a liaison with the appropriate ICES/EIFAC working groups on introductions and transfers of fish and on genetics; and if required, participate in joint meetings to consider questions of mutual interest.

JUNE 1988
REYKJAVIK

ANNEX 23

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)21

POTENTIAL IMPACTS OF SALMON FARMING ON WILD STOCKS

CNL(88)21

POTENTIAL IMPACTS OF SALMON FARMING ON WILD STOCKS

1. INTRODUCTION

1.1 The Atlantic salmon has colonised roughly its present distribution range since the last glaciation some 10,000 years ago. Representatives of the salmonid group of fish have been found in fossils dating back 5 million years. For the first time in the evolutionary history of the salmon man has made a sudden intervention to artificially propagate domesticated, selectively bred Atlantic salmon on a large and rapidly expanded scale. The advent of this salmon farming industry is an exciting and valuable development. It may even exert some degree of protective influence, at least economically, on the wild stocks. Nevertheless, this new industry could pose new threats to the wild stocks and such concerns have been expressed by a number of national and international organisations.

1.2 This paper, which should be read in conjunction with the detailed review attached (Annex 1) is prepared in accordance with the decision of the Council at its Fourth Annual Meeting. It presents a summary of the potential threats, the activities of other organisations and suggests possible action by the Council of NASCO.

2. POSSIBLE INTERACTIONS BETWEEN FARMED AND WILD FISH

Production of farmed fish

2.1 Salmon aquaculture is not new. The first commercial salmon hatchery was established on the Rhine in 1852 and by the turn of the century hatcheries had been established in almost every salmon producing country. The recent large scale expansion of salmon farming is, however, unprecedented. The industry has expanded from a production of 10 tonnes in 1970 to a production by eight countries of over 65,000 tonnes in 1987. There are estimates of a production of between 90,000 and 259,000 tonnes by 1990. This may be seen in relation to a wild salmon catch averaging under 10,000 tonnes over the last twenty years (Fig. 1). The attached review, examines the occurrence and behaviour of farmed fish in the wild (Section 2), the possible genetic interactions (Section 3), diseases and parasites (Section 4), the introduction of non-indigenous salmonids (Section 5), economic interaction (Section 6), and the impact upon the aquatic environment (Section 7).

Occurrence of farmed fish in the wild

2.2 Farmed salmon may occur in the wild as a result of accidental release (escape) or deliberate release. There is direct evidence that salmon farm escapees are caught in the Faroese long line fishery. It has been estimated that on average 15% of the fish held in fish farm cages escape accidentally. If this percentage is applied to the 1987 harvested production, up to 10,000 tonnes of farmed fish may have escaped to the wild. Recent reports from Norway suggest that up to 13% of the fish ascending rivers in southern Norway may be of farmed origin. In addition to escapees, unwanted parr may be deliberately released into the wild by salmon farmers or given to fishery managers for stocking.

Genetics

2.3 The Atlantic salmon is being domesticated by the salmon farming industry; farmed; fish have been selected for traits favourable for rearing in captivity, e.g. tameness, growth rate and late maturity. Hatchery production produces marked reductions in genetic variabilties. On the other hand it has been estimated that 2,000 distinct stocks of wild Atlantic salmon exist in Europe and North America. Clear genetic differences can be demonstrated between European, North American and Baltic salmon and studies within these groups have demonstrated genetic differences between and in some cases within river systems. These studies are supported by strong circumstantial evidence of physiological differences which are heritable. Several studies conclude that Atlantic salmon rivers should all be regarded as having genetically separate populations. The adaptive significance of these genetic differences has been demonstrated. The genetic variability in a wild salmon population enables adaptation to differing environmental conditions and therefore assists its long term survival.

2.4 In view of the risk of hybridisation posed by the large number of farmed fish in the wild there have been warnings of the need for the formulation of a strategy on how best to conserve the genetic resources that are still available. There has been one recorded instance of the risks of such introductions. The transfer of 350 million chum salmon eggs (from the Kalininka to the Naiba River in the Soviet Union) took place and twenty years later the run of salmon into the Naiba River was virtually extinct. This is an important example because Atlantic salmon show more genetic variability than Pacific salmon.

Introductions, diseases and parasites

2.5 The rapidly expanding aquaculture industry has led to an associated increase in the number and severity of diseases of farmed fish and such disease problems have led to growing concern about the possibility of the introduction and transfer of diseases from farm stocks to wild fish. The possible dangers to wild fish from introduced diseases and parasites have been highlighted by the problem of Gyrodactylus salaris, a monogenean fluke introduced to Norway with imported hatchery stock. The parasite now occurs in more than 28 watercourses and annual losses of salmon are already estimated to be 250-500 tonnes. The ICES ad hoc Study Group on Environmental Impact of Mariculture believed that the importation of exotic species or disease organisms is the greatest environmental risk associated with mariculture because the consequences may be widespread and irreversible. Concern has recently been expressed in the North American Commission of NASCO about the growing interest in the use of rainbow trout in sea-cages along the eastern seaboard of North America. The rainbow trout has the potential to pose a severe ecological threat to Atlantic salmon management.

Environment

2.6 The rapid growth of the salmon farming industry has led to an increased awareness that there may be considerable impacts on the aquatic environment, both in freshwater and marine conditions. The most significant characteristics of fish farm wastes as they affect water quality are nitrogen and phosphorous compounds, oxygen consumption, suspended solids and a range of therapeutic and prophylactic chemicals. Although the industry has posed only localised environmental problems to date its continued development, given anticipated growth, is likely to cause greater problems. Furthermore, there is concern that the behaviour of wild fish may be modified by the presence of cages.

3. ACTIVITIES OF OTHER ORGANISATIONS

3.1 The subject of inter-relationships between farmed and wild salmon was considered by the ANACAT Fish Committee at its 1987 meeting. The papers presented dealt mainly with the methods of distinguishing farmed and wild salmon, the occurrence of farmed salmon in the wild and possible impacts. It is intended that this topic could be considered further as part of a mini-symposium on spawning variability in 1989. ICES has established a Working Group on the Environmental Impacts of Mariculture which will meet for the first time in 1988 to consider, among other things criteria for site selection which will minimise the environmental impacts of mariculture.

3.2 Several Working Groups concerned with Introductions and Transfers have been established including those of ICES, EIFAC and the North American Commission of NASCO. ICES and EIFAC have prepared Codes of Practice concerning introductions and transfers. Some countries have not endorsed either code of practice while in some other countries the codes are only applied to the import of non-indigenous species. The NAC Working Group has produced a series of recommendations, which apply specifically to salmonids in Canada and the USA and which recognise the potential for adverse genetic effects, in addition to diseases and other ecological interactions, resulting from introductions and transfers. These recommendations included the prohibition of transfers of eastern hemisphere and Icelandic Atlantic salmon, and the use of alternate sources of stocks for both enhancement and aquaculture until appropriate protocols could be developed. Such protocols are now being drawn up by Health and Genetics sub-groups. The NAC group also prepared a computer-based inventory of salmonid introductions and transfers.

3.3 The Norwegian authorities have responded to the threats to the genetic resources of their salmon by establishing a sperm bank. Sperm banks have also been established to supply the salmon farming industry with disease free milt and research is currently underway into the feasibility of cryopreserving salmon eggs and embryos.

3.4 Commercial trials in the UK of the performance of all female, triploid salmon are now being undertaken. These fish are sterile and therefore avoid the problem to the farmer of maturation in the sea cages. This development, if adopted by the industry, could have favourable implications with regard to possible genetic effects of fish farm escapees. However, further research into the behaviour of these fish in the wild may be required.

3.5 In Norway and British Columbia regulations requiring a minimum distance between net-pen facilities and major salmon spawning streams, i.e. aquaculture-free zones, have been introduced.

POSSIBLE ACTION BY THE COUNCIL

4.1 NASCO holds the international responsibility for conservation of salmon stocks. There is clearly a need for further research into the effects of the new aquaculture industry on these stocks. Areas of research which have been highlighted include further development of methods of stock identification; assessment of the number of farmed salmon escaping, their migration pattern and whether or not they breed; and the effects of hybridisation between wild and farmed fish if this occurs. The Council might like to consider how such research might be stimulated.

4.2 The North American Commission of NASCO established a Bilateral Scientific Working Group in 1986. Their Report has been published separately as

Annex 13 to NAC(87)20. It includes recommended actions to be taken to reduce potential risks. The NAC group also developed an inventory of salmonid introductions and transfers. The Council may wish to consider if such actions should be recommended to the North East Atlantic Commission. As with the NAC Group this Commission might well liaise with the ICES Working Group on Introductions and Transfers.

4.3 The Council might like to consider whether an internationally agreed Code of Practice to protect wild stocks might be developed. Such a code could consider recommendations on, for example, aquaculture-free zones, the use of local broodstock, the disposal of surplus stock from aquaculture, the possible use of all female triploid stocks etc. A review of the main elements which might form the basis for a code could be carried out by the Council as part of its role in the conservation of salmon stocks under the Convention.

4.4 The Council might wish to consider in further detail the mechanics, costs and benefits of establishment of gene banks. In addition to established techniques for cryopreservation of sperm, research is underway in the UK and in other countries on cryopreservation of salmonid ova and embryos. A review of the state of these techniques and other methods of preserving genetic resources could be considered at the Sixth Annual Meeting.

4.5 The Council may wish to consider in more detail any evidence on the environmental effects of sea cages on wild stocks and review the evidence for diseases being transmitted from farmed to wild.

4.6 The Council may wish to see a review of the legislation relating to the interactions described in this paper as taken from the Laws, Regulations and Programmes Database which now exists.

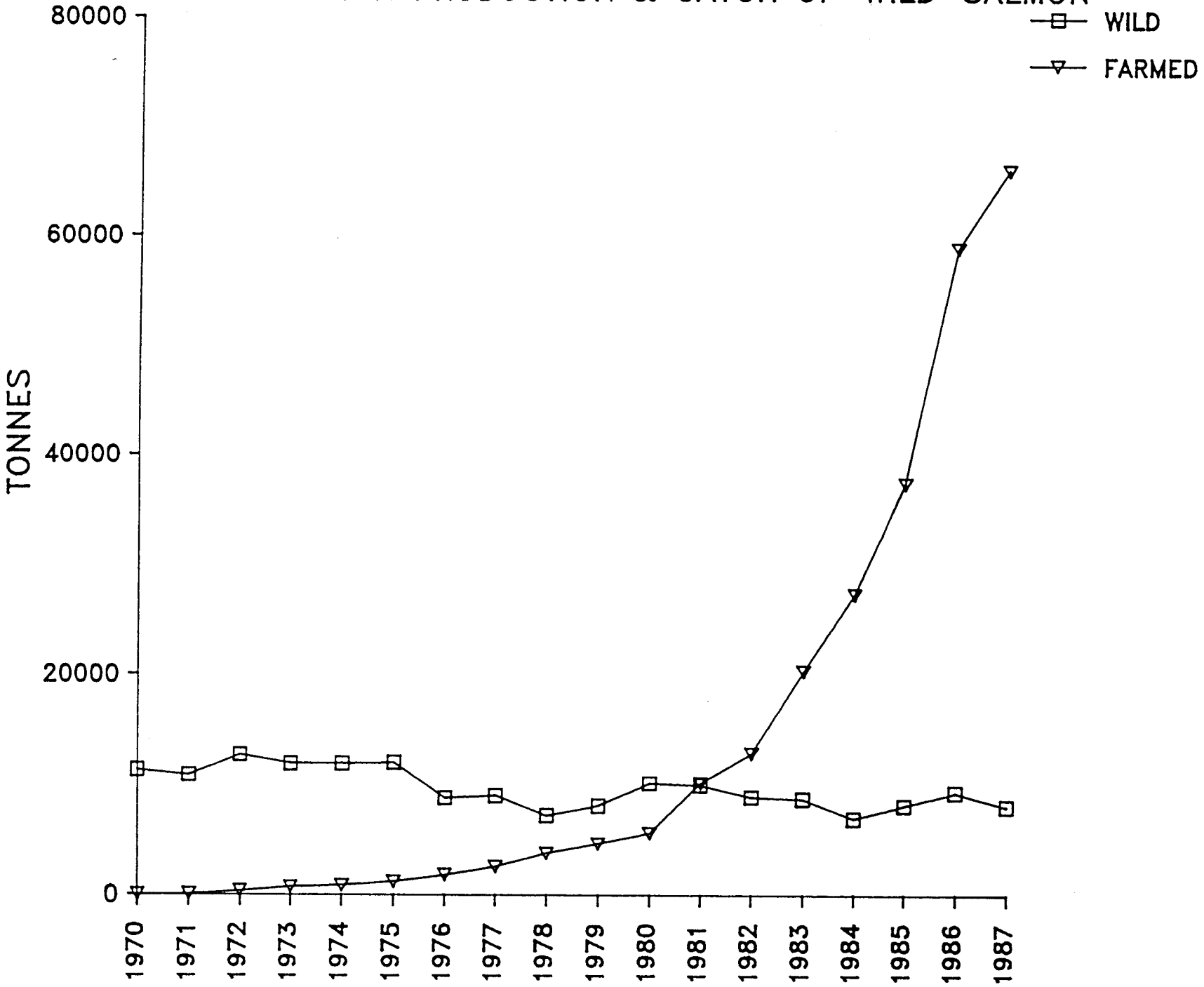
5. SUMMARY

5.1 The attached review requested by the Council examines in some detail the possible interactions between wild and farmed salmon. It concludes that the growth of aquaculture has produced new potential threats to the Atlantic salmon. Some of these are known to be serious but the effects of others are not known. These potential threats include loss of genetic variability, to introduction and transfer of diseases and parasites and changes in the aquatic environment. A number of organisations are studying the evidence for some of these interactions. The Council of NASCO may wish to consider which action it should take. Some options are listed above.

Secretary
Edinburgh
18 May 1988

FIGURE 1

FARMED SALMON PRODUCTION & CATCH OF 'WILD' SALMON



ANNEX 1

1. INTRODUCTION:

1.1 At its Fourth Annual Meeting the Council agreed that a brief review of the potential threats from salmon aquaculture on wild stocks be undertaken by the Secretary, including information on the activities of other organisations and the role NASCO may have in this matter. This paper concerns principally the salmon farming industry since this is the most rapidly expanding section of salmon aquaculture. Many of the potential threats also apply to the other sections of salmon aquaculture-enhancement, stocking and ranching.

1.2 There has been a recent large scale expansion of salmon aquaculture with the development of salmon farming i.e. rearing salmon in a system of total protection to the time of harvest (see Figure 1). In 1987, the industry produced over 65,000 tonnes of farmed salmon. The majority of this production (90%) was from Norway and Scotland other countries have also developed salmon farming on a significant scale. Recent reports have indicated scope for further large scale increases in production. For example, a recent Norwegian study estimated that a market potential of 120,000 + 30,000 tonnes will exist by 1990. Other estimates suggest a production level in Europe alone of 140,000 + 259,000 tonnes by 1990 with additional significant production from Chile, Eastern Canada and the United States of America. In the long term the most likely constraints to production within these estimates are economic with market saturation reducing prices, and increased capital costs associated with more difficult sites reducing profitability (Shaw and Muir, 1987). However, over the last ten years there has been continued growth with only short term reductions in the rate of growth reflecting problems associated with smolt supply and disease.

1.3 The advent of salmon farming is an exciting and valuable development and there is much to admire in the energy and growth of the new industry. The industry produces a high quality product with all year round availability and has created employment opportunities in remote rural communities. Furthermore, the industry's research and development programmes have provided much scientific information regarding growth patterns, survival and maturity of the Atlantic salmon (Laird and Needham, 1985), although this information has principally been of value to the salmon farmer. However, there is growing concern about possible interactions between farm reared salmon and the wild stocks. Among the organisations that have expressed their concern are the Atlantic Salmon Trust (UK), the Atlantic Salmon Federation (North America), Restoration of Atlantic Salmon in America Inc (USA), the Nature Conservancy Council (UK) and the Directorate for Nature Management (Norway).

1.4 This paper is a review of the available literature on the possible interactions. These interactions include genetic interactions such as intraspecific hybridisation, ecological interactions between Atlantic salmon and introduced species, transfer of diseases and parasites from farmed to wild fish, economic interactions and interactions with the environment of wild salmon. We have attempted to bring together information from a variety of sources and in general terms place it in some perspective so assisting the Parties to the NASCO Convention to consider what action might be taken in the light of the Convention which calls for the conservation of salmon stocks.

2. THE OCCURRENCE AND BEHAVIOUR OF FARMED FISH IN THE WILD

2.1 Clearly, some of the interactions noted above require the occurrence of farmed fish in the spawning and nursery areas of the Atlantic salmon. There is now growing evidence that substantial numbers of farmed Atlantic salmon have gained access to the wild through accidental release (escape) and deliberate release.

2.2 Accidental releases of farmed salmon may occur through handling errors, faulty gear, weather damage, predator damage or other forms of damage (e.g. vandalism, collisions etc.). In sheltered sites, simple square or rectangular cage units, capable of containing a stock of about 5 tonnes, are frequently used. The flotation collar of such units is intrinsically weak so the frequency of failure may be relatively high, but individual losses resulting from such failures may be relatively low (Institute of Aquaculture, 1987). As more exposed sites have been developed more sophisticated units capable of containing between 100-150 tonnes have been designed e.g. Bridgestone "High Seas" cage. A single incident involving one of these cages could result in a massive loss of stock to the wild although the frequency of failures may be relatively low (Institute of Aquaculture, 1987).

2.3 In 1986 direct evidence that salmon farm escapees were being caught in the Faroese long-line fishery became available. Muscle tissue canthaxanthin analysis revealed that 3% of a sample of 219 fish were of farmed origin having escaped after the smolt stage (Anon, 1987a). Furthermore, single incidences involving the escape of significant quantities of farmed salmon have been reported (e.g. 20-30 tonnes (Hansen et al, 1987); 90,000 salmon (Maitland, 1987); and 30,000 salmon (Mills, 1987)). It has been estimated that on average 15% of the fish held in fish farm cages escape accidentally (RASA, 1987). If this figure is applied to the 1987 production, approximately 2.5 million fish (up to 10,000 tonnes) of farmed fish may have escaped to the wild. Evidence from freshwater rainbow trout cage units has indicated that harvests of between 2.5 - 5% of total cage production may occur in the surrounding water body (Phillips et al, 1985). Recent reports from Norway suggest that up to 13% of the fish ascending rivers in southern Norway may be of farmed origin (see CNL(88)22). Studies in Norway have shown that immature farmed fish released into the wild migrated to North Atlantic feeding areas whereas mature fish entered rivers at random when they were ready to spawn (Hansen et al, 1987).

2.4 In addition to accidental release, surplus farm stock may be released or be available for release into the wild. High pre-smolt growth rate produces one year old smolts (S1s) thereby enabling early transfer to marine units and reducing the cost of the expensive freshwater stage (Naevdal, 1981). There may be other advantages in that it has been reported that one year old smolts produce a lower grilsing rate than two year old smolts thereby reducing the problems posed by maturation (Ritter and Newbould, 1977; Laird and Needham, 1985). Those parr that do not smoltify after 1 year (the potential S2s) are largely unwanted by the salmon farmers although if parr maturation has no deleterious effect on later age at maturity there may be a role for precociously mature male parr in reducing the generation interval in breeding programmes (Naevdal, 1983). However, in general, unwanted potential S2 smolts are removed during grading and either released into neighbouring rivers, sold to fishery managers or other fish farms, given away or rarely killed (Maitland, 1987; Mills, 1987). In some cases these smolts have been used to stock rivers which have lost their salmon stocks e.g. River Thames, England and River Carron, Scotland. In addition, however, they have been released into rivers already containing salmon populations. Again the scale of the problem is largely unknown but individual large scale releases are known. For example, Maitland (1987) reports that 60,000 of

these fish were released into the river Ness system and 8,000 were released into a small stream flowing into Loch Lomond. With the rapid expansion of the salmon farming industry enormous numbers of smolts are now being produced. For example, Norway now has the capacity to produce 183 million smolts a year, enough to give a grow-out of 130,000 tonnes and it is estimated that in excess of 23 million smolts will be produced in Scotland in 1988.

3. GENETIC INTERACTION:

3.1 Salmonid fish exhibit striking ecological and morphological intraspecific differences between and even within various waters. The widespread distribution and well marked homing instinct of the Atlantic salmon are attributes favouring the development of distinct stocks i.e a stock is a population which differs genetically from other populations of the same species (Wilkins, 1985). On the basis of circumstantial evidence the species has often been subdivided into genetically distinct sub-units (Ryman, 1983). For example, Saunders and Bailey (1980) estimated that 2000 stocks of Atlantic salmon exist in Europe and North America.

3.2 Recent electrophoretic studies have demonstrated clear genetic differences between European, North American and Baltic salmon. Moller (1970) demonstrated regional differences in North American salmon populations and although Payne (1974) argued that there was a latitudinal cline in North America, an analysis of more extensive data by Verspoor (1986) did not support this argument. Payne et al (1971) also demonstrated regional differences in British and Irish salmon populations but analysis of more extensive data by Cross and Healey (1983) provided unequivocal evidence of stock discreteness (Thorpe and Mitchell, 1981). Similar evidence was presented by Stahl (1983) for Baltic salmon where discreteness within and between river systems was demonstrated. These electrophoretic studies are supported by strong circumstantial evidence in the form of different physiological capacities which have been shown to be heritable and morphological differences between river populations (Thorpe and Mitchell, 1981). Cross and Healy (1983) concluded that the rivers in their study and possibly all Atlantic salmon rivers should be regarded as genetically separate populations.

3.3 Several studies have demonstrated the adaptive significance of genetic differences in salmonid populations. Riddell et al (1981) compared juvenile salmon from two tributaries of the Miramichi River and demonstrated that the juveniles from the river characterised by higher flows had more fusiform bodies and longer fins than fish from the slower flowing river. By rearing the progeny of salmon from the two tributaries under identical conditions they demonstrated that this interpopulation variation in body morphology had a genetic basis. Winter et al (1980) demonstrated that transferrin genotypes exhibit differential resistance to infections such as BKD and Kanis et at (1976) showed that mortality in salmon, particularly for the egg and alevin stages, was heritable. There is also evidence that the homing ability of salmon may be under genetic control. For example, Bams (1976) showed that while imprinting alone brought back some of an introduced donor stock of pink salmon, addition of the locally adapted paternal genes improved the returns. Browne (1986) considered that the differences in the relative performance of hatchery and wild smolts were mainly associated with accuracy of homing and overall survival. Ferguson (1986) concluded that genetic variability is a key factor in a populations capacity to produce new adaptations in response to environmental change and therefore to its long term survival.

3.4 During the selection of stock for the developing salmon farming industry, the genetic diversity present in wild stocks enabled the farmers to select for rapidly growing, late maturing fish which were suitable for improvement of productive capacity e.g. Norwegian river Alta stock (Naevdal, 1981). Selective breeding has subsequently resulted in significant genetic gain in growth rate, reduced frequency of early sexual maturation and tameness of the fish (Gjedrum, 1985). The Atlantic salmon is being domesticated, a process including selection for calmness, little fear of handling and tolerance to noise and the presence of people (Gjedrum, 1979). In contrast to the genetic diversity demonstrated in wild salmon, hatchery production results in significant reductions in genetic variation compared to the wild fish from which they were derived (Ryman and Stahl, 1980; Cross and King, 1983). This loss of genetic variation has been attributed to the use of small numbers of parents and the effects of genetic drift (Allendorf and Phelps, 1980; Cross and King, (1983), Johansson (1981) and Cross and King (1983) believed that hatchery procedures select for salmon well adapted to rearing conditions but less well adapted to survival in the wild. The salmon farming industry has also resulted in international transfers of stock. For example, Norwegian stock have been imported into Scottish fish farms and vice-versa and Finnish and Scottish stock have been imported to aquaculture facilities in Maine. In addition techniques such as gene implantation and induced ploidy may be used by the salmon farming industry (NAC, 1987).

3.5 In view of the genetic differences between hatchery and wild stocks, Stahl (1983) warned that there is a strong need "for the formulation of a strategy of how to best conserve the genetic resources that are still available". There are very few examples in the scientific literature of studies that have monitored the genetic effects of hatchery stocks on the recipient wild stock's performance. Reisenbichler and McIntyre (1977) compared the survival of offspring from matings of hatchery x hatchery, hatchery x wild and wild x wild, summer steelhead, Salmo gairdneri. They demonstrated that in the study streams wild fish had the highest survival rates and they concluded that if the hatchery fish interbred with wild fish there may be a reduction in smolt output. Such introgression was demonstrated by Taggart and Ferguson (1986) as a result of a 15 year stocking programme in the Erne-Macnean system. The potential dangers of introgression have been described by Altukhov (1981). Between 1964-1971 350 million fertilised chum salmon (Oncorhynchus keta) eggs were transferred from the Kalininka river to the Naiba river on Sakhalin Island. By 1969-1970 there had been a genetic shift in the later running Naiba stock and by 1985 the population, which previously supported a run of about 650,000 chum salmon, was virtually extinct. Thorpe (1987) stressed the importance of this example for managers of Atlantic salmon stocks which are known to exhibit more genetic variability than Pacific salmon stocks.

3.6 Saunders and Schom (1985) believed that the effective spawning population of wild salmon populations, which may comprise sexually mature parr and anadromous adults of various ages, even in small populations may be quite large thereby leading to low levels of inbreeding. Maitland (1987) considered that the genetic problem associated with farmed salmon stems from the fact that farmed salmon became more genetically distinct from wild stocks with each generation in captivity and that large numbers of these domesticated fish are now being released into river systems. In the past, relatively small numbers of fish have been moved or have strayed from one system to another and these incomers are less likely to be successful and so have little genetic impact when present in small numbers (Maitland, 1987). Similarly, Isaksson (1985) considered that large scale releases of ranched salmon, which are genetically distinct from neighbouring wild stocks, could have an effect on the wild stock if straying occurred, whereas moderate releases would have minimal effects.

4. DISEASES AND PARASITES:

4.1 The rapidly expanding aquaculture industry has led to an associated increase in the number and severity of diseases of farmed fish (Smith, 1985). For example, Hitra disease, which was first identified in 1979, has recently caused severe losses in Norway (Anon, 1987b). Such disease problems on salmon farms have led to growing concern about the possibility of transfer of diseases and parasites from fish farms to wild stocks. The potential negative interactions are not one sided, with both farmed and wild stocks potentially at risk (Anderson, 1987). In the case of diseases introduced to the wild, however, treatment is not usually possible while, in contrast, the farming industry has responded rapidly to disease problems e.g. a vaccine against Hitra disease has already been developed (Anon, 1987b). In addition, there have been considerable trans-Atlantic and other international movements of salmonid stocks associated with the aquaculture industry. Mills (1987) considered that although considerable concern has been expressed regarding the introduction and transfer of disease with stock there is little record of wild fish being affected by farm stock. Similarly, Cobham Resource Consultants (1987) considered that the available data provide no conclusive evidence of significant adverse effects. However, as Anderson (1987) points out, transmission of disease from farmed to wild stock is hard to establish.

4.2 Egidius (1987) describes the import of furunculosis, Aeromonas salmonicida, to Norway with Scottish salmon smolts. The disease has subsequently been reported from a free living salmon. Similarly, although Munro et al (1976) reported the spread of Infectious Pancreatic Necrosis from farmed stock to wild fish they demonstrated a low prevalence and limited distribution of the virus in wild fish and the infection appeared to be "inactivated" within a short distance of the farm. Concern has recently been expressed about the possible import of Infectious Hematopoietic Necrosis (IHN) with stock movements from the west to east coasts of North America (NAC, 1987). IHN was, isolated from two rainbow trout farms in France during 1987. Prior to this the virus had not been isolated from Europe (ICES, 1987). The most severe documented damage to wild salmon stocks which appears to have resulted from international stock movements has been caused by the monogenean fluke Gyrodactylus salaris and highlights the dangers of introducing exotic diseases or strains of diseases and parasites with international stock movements. The most likely hypothesis is that this parasite was introduced to Norway and subsequently dispersed by fish stocking from infected hatcheries (Dolmer, 1987). The parasite now occurs in more than 28 Norwegian salmon rivers and appears to pose one of the most serious threats to salmon in Norway. It has been estimated that annual losses of 250-500 tonnes of salmon have occurred (Johnson and Jensen, 1986) and the Norwegian authorities are now treating entire river systems with rotenone in order to try to eliminate the parasite. Gyrodactylus has recently been added to the list of notifiable diseases by the Ministry of Agriculture, Fisheries and Food in the United Kingdom as a precautionary measure.

4.3 Cage rearing can cause eutrophication and this has been linked to increased parasite loads in some fish populations and pathogenic fungal infections are more common in eutrophic waters. Bacterial numbers are also related to trophic status (Phillips et al, 1985).

5. INTRODUCTION OF NON-INDIGENOUS SALMONIDS:

5.1 Non-indigenous species, with attributes favourable to the fish farmer or salmon rancher, have been introduced into the North Atlantic, often

accompanied by accidental introductions of disease organisms (Institute of Aquaculture, 1987). The ICES ad hoc Study Group on Environmental Impact of Mariculture believe that the importation of exotic species or disease organisms poses the greatest environmental risk of mariculture since the consequences may be widespread and irreversible.

5.2 In eastern North America, coho salmon (Oncorhynchus kisutch), which were introduced in order to develop an aquaculture industry based on sea-ranching, have spawned regularly in the Cornwallis river, Nova Scotia. It is thought that there would be little interaction between juvenile coho and Atlantic salmon because of habitat segregation. However, superimposition of redds could occur in rivers where spawning substrate is limited and juvenile interactions could occur in rivers where Atlantic salmon occur in pools e.g. Newfoundland (NAC, 1987). Concern has recently been expressed about the growing interest in the use of rainbow trout (Salmo gairdneri) in sea-cages along the eastern seaboard of North America. This species has the potential to pose a very severe ecological threat to Atlantic salmon management (NAC, 1987).

5.3 In Europe, coho salmon eggs have been imported to France since 1971 as part of a cage rearing project in Brittany and Normandy. Considerable escapes and intentional releases have occurred but as with many other introduced populations of Pacific salmon the coho appear to have died out after initial spawning success (Euzenat and Fournel, 1981). Pink salmon, Oncorhynchus gorbuscha, introduced to the Kola peninsula have aggregated in Norwegian rivers since 1960 and successful spawning has occurred (Bjerknes and Vaag, 1980). However, Solomon (1979) considered that since this species migrates to sea as fry before commencing feeding the possible adverse interaction with native salmonids is much reduced.

5.4 Solomon (1979) concluded that, before any introduction is undertaken, it is desirable to investigate any possible risks including adverse competitive interactions and introduction of new disease organisms or strains of disease organisms. Protocols regarding introductions and transfers are presently being prepared by the Bilateral Scientific Working Group on Introductions and Transfers of the North American Commission of NASCO through health and genetic sub-groups.

6. ECONOMIC INTERACTIONS:

6.1 Prior to the advent of salmon farming, trading in Atlantic salmon was very much a seller's market (Stansfeld, 1985) with availability of the wild stocks and regulations governing the harvest, rather than the demand, determining the supply from the fisheries (Anderson, 1987). The advent of a large supply of high quality, fresh farmed salmon with all year round availability has had a marked effect on the traditional wild salmon market with consequences for commercial netsmen.

6.2 In Scotland the effect of the influx of farmed salmon was to reduce and stabilise salmon prices. At the same time the premium price enjoyed by wild salmon over farmed salmon has been generally reduced in Scotland and Norway. In Canada, farmed salmon attain a premium price (Anderson, 1987). Tuomi (1987) believed that the development of the salmon farming industry would end the traditional commercial fishery for salmon in Canada. In Scotland, price reductions have resulted in many marginal stations closing and other stations working shorter seasons. These changes are likely to result in a change in the pattern of exploitation of salmon and may favour the development of salmon ranching (Stansfeld, 1985).

6.3 Another effect of the all year round availability of fresh salmon has been a

reduction in the market for frozen salmon in Scotland. It is possible that this market will be particularly hard hit by the salmon farming industry. The small market that still exists for frozen salmon in Scotland is now largely supplied by the Greenland and Faroese fisheries (Stansfeld, 1985).

6.4 Hansen et al (1987) reported that reared fish augment the commercial catches of wild salmon in Norway but warned that if an increased output of reared fish lead to higher fishing effort in mixed stock fisheries natural salmon stocks may be over-exploited.

7. IMPACT ON THE AQUATIC ENVIRONMENT:

7.1 The rapid growth of the salmon farming industry has led to an increased awareness that there may be considerable impacts on the aquatic environment, both in freshwater and marine conditions. This concern is shared by conservationists and the fish farmers who fear that the harmful feedback could affect the economic viability of the farm (Gowen and Bradbury, 1987).

7.2 The most significant characteristics of fish farm wastes as they affect water quality are nitrogen and phosphorous compounds, oxygen consumption and suspended solids. The impact of these wastes is influenced by the nature and amount of waste produced and the characteristics of the recipient environment (Institute of Aquaculture, 1988). In addition a wide variety of chemicals including pharmaceuticals and other chemicals used in disease treatment, materials incorporated in feeds and treatments applied to equipment may enter the recipient water.

7.3 Salmon cage culture understandably requires the maintenance of an environment suitable for salmon and studies on the impact of cage culture of rainbow trout have been unable to demonstrate any adverse impact of eutrophication (Phillips et al 1985). However, vitamin and trace materials may have subtle effects and there is evidence that the toxicity of Gyrodinium aureolum is enhanced by biotin, a constituent of fish farm wastes. There are also examples of localised phytoplankton blooms occurring in enclosed sea lochs causing mortality of farmed stock. Problems associated with sedimentation and reduced dissolved oxygen concentrations are likely to be localised in nature. These problems are likely to be more severe on farms using fresh fish or moist pelleted feeds.

7.4 Solbe (1982) carried out a questionnaire survey of fish farms in the United Kingdom and concluded that there was little deterioration in either biotic indices or fishery status as a result of fish farm effluent. Where fishery status had declined intensive use of water was a common feature. Similarly, Alabaster (1982) showed that downstream fisheries were generally not adversely affected unless the total flow of recipient water was less than 5 litre/sec/tonne of annual production. Maitland (1985) considered that more information was needed on the effect after discharge of therapeutic and prophylactic chemicals.

7.5 There is increasing evidence that the behaviour of wild fish may be modified by the presence of cages. Clearly it is important to ascertain whether the migratory behaviour of salmon is adversely affected by farming in and around rivers supporting wild populations of salmon (Phillips et al, 1985).

8. ACTIVITIES OF OTHER ORGANISATIONS:

8.1 At its 1987 meeting the ANACAT Fish Committee of ICES held a special

topic session on the "Inter-relationships between wild and farmed salmon and wild and farmed eels". Nine papers were presented on the inter-relationships between farmed and wild salmon. These papers covered methods of distinguishing reared and wild salmon, the occurrence of farmed salmon in the Faroese fishery and the possible impact of farmed fish on the wild stocks. The Committee endorsed a proposal for a mini-symposium at the 1989 Statutory Meeting to discuss "Spawning Variability and the Implications for the Dynamics and well being of Stocks". The Committee considered that contributions to this symposium could include comparative studies of wild and cultured anadromous fishes as relative contributors to the reproductive potential of the stocks.

8.2 Both ICES and EIFAC have established Working Groups to consider the possible adverse effects of introductions/transfers of aquatic organisms. The ICES Working Group on Introductions and Transfers of Marine Organisms prepared a Code of Practice to Reduce the Risks of Adverse Effects arising from Introductions of Non-Indigenous Marine Species which was adopted by ICES in 1973. A similar code of practice was prepared for inland aquatic organisms by the EIFAC Working Party on Introductions. These Codes of Practice recommend careful assessment of the effects of an introduced species and lay down guidelines to minimise the risk of introducing disease agents with the introduced organism. However, some countries have not endorsed either Code of Practice (NAC, 1987) while in some other countries the code is only applied to the import of non-indigenous species (ICES, 1987). Concern about the trans-Atlantic and other transfers of Atlantic salmon relative to the genetic and ecological implications of stock mixing has recently been expressed by the ICES Working Group on Introductions and Transfers of marine organisms. This Group recommended that studies on stock identification and the effects of stock movements be encouraged. The Group is also establishing a computerised inventory and bibliography of Introductions and Transfers of marine organisms.

8.3 In 1987, the Bilateral Scientific Working Group of the North American Commission on Salmonid Introductions and Transfers made a series of recommendations to the North American Commission of NASCO regarding both introduction and transfer of salmonids to the eastern sea-board of North America. These recommendations recognised the potential for adverse genetic effects, in addition to disease and other ecological interactions, resulting from introductions and transfers. These recommendations included the prohibition of transfers of eastern hemisphere and Icelandic Atlantic salmon and the use of alternate sources of stocks for both enhancement and aquaculture efforts from within the local area until appropriate protocols can be developed. The Group also established a computerised database on salmonid introductions and transfers. Since their report was published the Group has established Health and Genetics sub-groups whose primary tasks are to develop protocols and/or model fish health and genetics programmes for the protection of wild stocks in the NAC area.

8.4 In response to a recommendation from an ad hoc Study Group ICES has established a Working Group on the Environmental Impacts of Mariculture which will meet for the first time in 1988. The Working Group will review ongoing research projects on environmental issues related to mariculture; evaluate techniques and monitoring strategies; determine criteria for site selection which will minimise environmental impacts and compile a directory of chemicals and their properties currently used in mariculture.

8.5 The Norwegian authorities consider that salmon farm escapees represent a potentially greater threat to natural genetic resources than either surface water acidification or Gyrodactylus. The proportion of farmed fish occurring

in some Norwegian rivers is expected to increase above the present level of 13% as the industry continues to expand. With this problem, together with surface water acidification and Gyrodactylus in mind, the Directorate for Nature Management has established a national gene (sperm) bank for wild salmon (see paper CNL(87)47 for details). In the first year of a 10 year programme, field techniques were developed and samples were collected from 47 different stocks. A gene (sperm) bank designed to provide the Scottish salmon farming industry with large volumes of disease free milt has been established at Stirling University's Institute of Aquaculture (Rana, 1988).

8.6 Cornerstones of the successful marketing of farmed salmon by Organisations such as the Norwegian Fish Farmers Sales Organisation and the Scottish Salmon Growers Association have been the health value of salmon in the diet and the image of the wild fish occurring in unpolluted waters. The industry has tended to respond rapidly to environmental issues which could adversely affect the marketability of their product, e.g. the use of the antifoulant tributyl-tin. Concern in the industry about the possible degradation of the aquatic environment, particularly in the vicinity of the salmon farm, has led to a growing interest in the production of high digestibility, low pollution feeds. The marketability of these feeds will, however, depend on their expense (Institute of Aquaculture, 1987).

8.7 Problems of maturation in rainbow trout farming have led to the development of all female, triploid stocks which are sterile. These fish are now widely used by the trout farming industry in the UK and the techniques are now being tested with Atlantic salmon. Experimental trials have indicated that triploid fish grow slightly less well than diploid fish to the grilse stage but their growth is more predictable and there is no problem of maturation thereby avoiding the labour intensive grading of grilse. Full scale commercial testing of triploid smolts is now being undertaken (Anon, 1986). It remains to be seen if the industry will adopt this technology since the use of hormones, albeit one generation away from harvested fish, may be perceived as a threat to the marketability of the product. The adoption of this technology by the industry would have implications in the consideration of the possible genetic interactions of farmed and wild stocks. Sterile fish farm escapees clearly cannot interbreed with wild fish and in the absence of maturation it is possible that these fish might not even enter freshwater. However, if they did ascend into freshwater in large numbers there may still be the possibility of adverse interactions with wild stocks. Maitland (1987) describes several examples of biological control where mass release of sterile males has been used in order to control unwanted populations e.g. the sea lamprey Petromyzon marinus in the Great Lakes. The release of sterile females might be expected to have less of an effect than release of sterile males although the behaviour of these fish has not yet been studied in the wild.

8.8 In Norway and British Columbia regulations laying down required separation distances between cage units have been introduced. In addition, regulations requiring a minimum distance between net-pen facilities and major salmon spawning streams (3km) have been introduced. In the Maritime Provinces of Canada the density of salmon cage culture is restricted to not more than 24 cages and a maximum of 2 hectares per lease. Recent Norwegian legislation has placed a complete embargo on the movement of any salmonid fish from one river system to another and on the large scale release of smolts (Maitland, 1987) In Sweden, a recent statute has enabled salmon rivers to be classified on being of national interest on the basis of its genetic characteristics.

8.9 In the United Kingdom, the Nature Conservancy Council (NCC) has recently commissioned two reports (Maitland, 1987; Institute of Aquaculture, 1988) on

the environmental impacts of salmon farming. Maitland's report concerns the genetic impact of farmed Atlantic salmon on wild populations and he concludes:

> "The threats to wild stocks from salmon farming are potentially serious and must be taken account of in the development of the industry. The current practice in Scotland of the release of large numbers of parr and smolts from fish farms into lochs and rivers may result in the deterioration of wild salmon stocks. This practice should be stopped and suitable research into the various potential problems posed by salmon farming initiated. The development of codes of practice is an important step in solving the problem....."

The NCC plans to promote the development of nature conservation guidelines for the marine environment using the Institute of Aquaculture report and other commissioned work (Cobham Resource Consultants, 1987). Guidelines on nature conservation and freshwater fish farming have already been developed.

8.10 A further report entitled "An Environmental Assessment of Fish Farming" (Cobham Resource Consultants, 197) has recently been prepared for the Countryside Commission for Scotland, the Crown Estate Commissioners, the Highlands and Islands Development Board and the Scottish Salmon Grower's Association. The report concludes that, to date, the industry has posed only limited environmental problems, but that the continued development, given anticipated growth, is likely to pose greater problems. Recommendations as to good practice in fish farm siting, design and management were made although nature conservation was outwith the remit of the report.

9. POSSIBLE ROLES FOR NASCO

9.1 This paper has attempted to bring together information from a variety of sources and to place it in some perspective thereby assisting the Parties to the NASCO Convention to consider what action might be taken in the light of the Convention which calls for the conservation of salmon stocks.

9.2 The salmon farming industry has developed extremely rapidly and there is clearly a need for further research into the possible effects of the industry on wild stocks. Hansen et al (1987) considered that there is an urgent need to estimate the number of fish escaping from farms; to study their migration pattern, and to investigate their possible effects on wild stocks. The ICES Working Group on Introductions and Transfer of Marine Organisms recommended that studies be encouraged by member countries to determine means of stock identification and to examine the effects of trans-Atlantic and other transfers of Atlantic salmon and the NAC Bilateral Scientific Working Group on Introductions and Transfers considered that there was an urgent need to develop new techniques to study the effects of intra-specific hybridisation. The Council might like to consider if NASCO has a role to play in stimulating this research.

9.3 The North American Commission of NASCO established a Bilateral Scientific Working Group in 1986. This group reported back to the Commission at its Fourth Annual Meeting and their report has been published separately as Annex 13 to NAC(87)20. The Report included recommended actions to be taken to reduce the potential risks to eastern seaboard salmon stocks until appropriate protocols can be developed. These protocols will include model programs for the protection of fish health, genetic integrity and productivity of salmonid stocks. The NAC Working Group also developed an inventory of computer-based salmonid introductions and transfers. Council may like to

consider if such actions should be considered for the entire Convention area.

9.4 The Council might like to consider the production of a Code of Practice to minimise the adverse effects of aquaculture on wild stocks. Such a Code of Practice could consider recommendations such as "aquaculture free zones"; the use of all female triploid stock; the use of local broodstock; disposal of surplus stock etc. A review could be prepared for consideration by the Council at its Sixth Annual Meeting.

9.5 Atlantic salmon gene (sperm) banks have been established in Norway in response to concern about loss of genetic resources in the wild stocks and in Scotland in order to supply the industry with disease-free milt. Research is presently being undertaken by Cell Systems, a Cambridge (England) based biotechnology company, into cryopreservation of salmonid ova and embryos. The development of cryopreservation and the establishment of gene banks and other methods of maintaining genetic resources such as "pristine preserves" could be reviewed for consideration by the Council at its Sixth Annual Meeting.

9.6 The Council may wish to see a review of the legislation relating to the interactions described in this paper as taken from the Laws, Regulations and Programmes Database which now exists.

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JUNE 1988
REYKJAVIK

ANNEX 24

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)22

RETURNS UNDER ARTICLES 14 & 15 OF THE CONVENTION

CNL(88)22

RETURNS UNDER ARTICLES 14 AND 15 OF THE CONVENTION

1. At its Fourth Annual Meeting the Council agreed a format (CNL(87)14R1) for the annual return under Articles 14 and 15 of the Convention. This format was designed to simplify and harmonise the reporting procedure. The form for the 1987 return was circulated on 22 December 1987 for completion by the Parties. All Parties were requested to complete and return the form even if there had been no changes since the last notification. Where changes have been notified under Article 15, the Laws, Regulations and Programmes concerned have been lodged with the Secretariat and this information will be incorporated into the Laws, Regulations and Programmes database. Copies of the detailed submissions are available from the Secretariat. In view of the large volume of paperwork involved a summary of the new actions taken under Articles 14 and 15 of the Convention is attached.

2. The Council might like to consider whether this is an acceptable method of reporting these returns.

Secretary
Edinburgh
17 May 1988

ARTICLE 14

1. ACTIONS TAKEN TO MAKE EFFECTIVE THE PROVISIONS OF THE CONVENTION.

1.1 The prohibition of fishing for salmon beyond 12* nautical miles from the baselines from which the breadth of the territorial sea is measured.

* 40 nautical miles at West Greenland
* Area of fisheries jurisdiction of the Faroe Islands

NO NEW ACTIONS

1.2 Inviting the attention of States not party to the Convention to any matter relating to the activities of the vessels of that State which appears to affect adversely the salmon stocks subject to the Convention.

NO NEW ACTIONS

1.3 Measures to minimise by-catches of salmon originating in the rivers of the other member. [North American Commission members only]

NO NEW ACTIONS

1.4 Alteration in fishing patters in a manner which results in the initiation of fishing or increase in catches of salmon originating in the rivers of another Party, except with the consent of the latter. [North American Commission members only]

NO NEW ACTIONS

2. ACTIONS TAKEN TO IMPLEMENT REGULATORY MEASURES UNDER ARTICLE 13

NO NEW ACTIONS

ARTICLE 15

3. LAWS, REGULATIONS AND PROGRAMMES ADOPTED OR REPEALED SINCE THE LAST NOTIFICATION

SUMMARY OF THE REPORTS AS SUBMITTED BY THE PARTIES

Canada

In New Brunswick, Nova Scotia and Newfoundland, anglers must now stop fishing for salmon once they have retained their daily or seasonal catch limits, or on a daily basis, have released a maximum number of fish equal to twice the daily catch limit. The same regulation is being proposed for Prince Edward Island.

EEC

The wealth of salmon legislation of a Community, national, regional or local nature within the European Community is subject to a process of continuous review and assessment to ensure its effectiveness for the conservation and rational management of the salmon stocks concerned. Therefore, whilst major framework legislation such as the UK Salmon Act of 1986 are not by their nature in the short-term subject to modification, Laws are enacted, adopted or repealed relating to the day-to-day management of the stocks at the level of rivers or river systems in conformity with the objectives of Community management.

Norway

A special law commission established in 1981 in order to review the Salmon Act from 1964, completed their work in January 1987. The document is being considered by all parties engaged in salmon management, research or fishing. The opening date for fishing with pound nets has been altered from May 15 to June 1. A gene bank for Atlantic salmon is being established.

Sweden

In 1986 new regulations on the fishery for salmon and trout in the counties of Goteborg and Bohus (Ordinance FIFS 1986:2); Halland (Ordinance FIFS 1986:3 and others) and parts of the counties of Kristianstad and Malmohus (Ordinance 1986:4) were introduced. These regulations define closed seasons, closed areas, permitted fishing methods and minimum sizes for both freshwater areas and coastal areas. All fishing for salmon in the sea beyond 4 nautical miles from the base-line is prohibited. On 1 July, 1987 a new law on natural resources entered into force. On the basis of this law, areas of national interest with respect to commercial fisheries, recreational activities and nature conservation are being distinguished. All waters with salmon populations have been proposed to be of national interest with regard to commercial and/or recreational fisheries and/or high genetic characteristics. In the physical planning of coastal and marine areas it is important to evaluate and specify the fish species and fishery interests. The National Board of Fisheries has developed a new comprehensive method to specify the importance of a particular area of water to commercial and sport fishing, and aquaculture based on biological, chemical, physical and economic criteria. The National Board of Fisheries, together with the National Board of Physical Planning and Building has developed maps to accord with physical planning demands.

USA

The new Atlantic Salmon Fishery Management Plan became effective on 17 March,

1988. The plan establishes a management program for the US Atlantic Salmon resource to complement the existing management programs of the New England States, and to complement Federal Management Authority over salmon of domestic origin on the high seas conferred to the United States as a member of NASCO. The plan prohibits the possession of Atlantic salmon taken from federal waters, thereby preventing the interception of migratory salmon on their return to natal waters.

USSR

Regulations on the concentrated Atlantic salmon fishery in the Murmansk region rivers were adopted for 1987. In the Pechenga, BZ Litsa, Ura, Tuva, Iokanga, Ponoi and Muchka rivers exploitation is regulated by alternating days of fishing and spawning escapement. In the Varzuga, Umba and Kitsa rivers 37% of the spawning stock is withdrawn. Fishing and escapement through counting fences in the Varzuga and Kitsa rivers occur on the same day. In the Tuloma River, 50% of the total stock is withdrawn by fishing. In the Kola River part of the spawning stock is fished out for fish culture purposes, the rest is withdrawn by the fishery. In the Luvenga River not more than two thirds of the stock is removed for fish culture purposes and the rest is allowed to migrate to the spawning grounds in autumn. Protection of the river should be intensified by the Kandalaksha inspection at this time.

In the Pechenga, Ura, B.Z. Litsa, and Muchka rivers the fishery should be completed by 1 August and counting fences should be removed. In agreement with PINRO and Murmanrybvod (MRV) the fishery period can be changed. Detailed regulations concerning the fishery in the Umba River were adopted.

In order to promote the migration of spawners to the spawning grounds the sea fishery is prohibited with any type of gear. The salmon fishery is prohibited in the Barents Sea throughout the year and in the White Sea during the period of operation of the fences in the Ponoi and Varzuga Rivers. In the Ponoi and Varzuga Rivers fishing for salmon with trap nets is allowed in pro-estuarine fishing places during the period when counting fences are removed or do not work. Regulations concerning the methods to be used in operating counting fences were adopted. Murmanrybvod appoints an inspector to monitor the number of fish caught by a fence and the number of spawners allowed to escape through it.

4. OTHER NEW COMMITMENTS RELATING TO THE CONSERVATION, RESTORATION, ENHANCEMENT AND RATIONAL MANAGEMENT OF SALMON STOCKS SUBJECT TO THE CONVENTION

Canada

It was announced that, starting in 1988, anglers fishing in Newfoundland and Labrador would be required to tag their fish immediately upon retention.

Denmark (In respect of Faroe Islands and Greenland)

The Faroese fishery was closed for 1 month from 15 December 1987 to 15 January 1988.

EEC

These new commitments are incorporated in the above mentioned section. Further, the Community considers a commitment to maintain in force effective, existing measures to be tantamount to a new commitment.

USSR

In 1987 the coastal White Sea fishery limit was equal to 137 tons.

5. OTHER FACTORS WHICH MAY SIGNIFICANTLY AFFECT THE ABUNDANCE OF SALMON STOCKS SUBJECT TO THE CONVENTION

EEC

Awaiting the ACFM Report to analyse this factor.

Iceland

Increased ocean ranching programmes will lead to increased abundance of Icelandic origin salmon in the North Atlantic.

Norway

The fluke Gyrodactylus salaris has been discovered in the river Drammenselva, a major salmon river in S-E Norway. Farmed salmon are entering rivers in increasing numbers. A survey undertaken by fish managers in 1987, revealed that 13% of the salmon entering the rivers of Southern Norway originates from fish farms.

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ANNEX 25

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)49

DECISION OF THE COUNCIL TO EXTEND THE CONTRACT OF THE SECRETARY

The Council having regard to its decision at its First Annual Meeting in 1984 to appoint Dr Malcolm Windsor as Secretary to the Organization until 1988, decides:

- to extend his appointment as Secretary for a period of five years from 15 June 1988. This appointment to be renewable upon the mutual agreement of both parties

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ANNEX 26

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

COUNCIL

PAPER CNL(88)31

PRESS RELEASE

This week representatives of the nine Parties which are signatories to the NASCO Convention met in Reykjavik, Iceland at the Fifth Annual Meeting of the North Atlantic Salmon Conservation Organization (NASCO). The Organization was established in 1984 by a Convention signed in Reykjavik with the objective of contributing to the conservation, restoration, enhancement and rational management of salmon stocks. The Fifth Annual Meeting of NASCO was opened by the Minister of Agriculture, Mr Jon Helgason. After an opening speech by the President, Mr Gudmundur Eiriksson (Iceland), each of the Parties gave an opening statement. The Parties to the Convention are Canada, Denmark (in respect of the Faroe Islands and Greenland), the EEC, Finland, Iceland, Norway, Sweden, the USA, and the USSR.

Detailed discussion on the salmon fisheries were held in the three regional Commissions of NASCO - the North American Commission (NAC), the West Greenland Commission (WGC), and the North-East Atlantic Commission (NEAC). Both the NAC and the NEAC had regulatory measures in place. The effects of these measures, the state of the fisheries and the scientific advice received on these stocks was reviewed. The West Greenland Commission agreed a regulatory measure for the years 1988, 1989 and 1990. This measure restricts the total catch to 2520 tonnes over these three years and in any given year the annual catch shall not exceed the annual average by more than 10%.

The Council of the Organization took a number of measures related to its responsibilities under the Convention. First, the Council received official catch statistics from the Parties and agreed on their future format. Second, they agreed that the analysis of the comparability of these catch statistics should continue as soon as all information had been received. Thirdly, they received an interim report from the Secretary on the data base on Laws, Regulations and Programmes, covering all members of NASCO, which was being set up by the Organization. Fourthly, they agreed on the compilation of tagging data and agreed to institute a lottery to encourage tag returns as is used by some other international fishery organizations. Fifthly, the Council considered the threats posed to the wild stocks by the very rapid growth of salmonid aquaculture in the North Atlantic. They decided on a number of measures to assess the impact of salmonid aquaculture on the wild stocks.

The Council elected Mr Allen E Peterson Jr (USA) to be its President and Mr Svein Aage Mehli (Norway) to be its Vice President.

The Sixth Annual Meeting of the Organization is to be held in Edinburgh, Scotland, from 13 to 16 June 1989.

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ANNEX 27

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

LIST OF COUNCIL PAPERS

Paper No.	Title
CNL(88)1	Provisional Agenda
CNL(88)2	Draft Agenda
CNL(88)3	Explanatory Memorandum on Draft Agenda CNL(88)2
CNL(88)4	Proposed Schedule of Meetings
CNL(88)5	Election of Officers
CNL(88)6	Status of Ratifications of and Accessions to the Convention
CNL(88)7	Applications for Non-Government Observer Status at the 1988 meetings
CNL(88)8	Membership of the Commissions of NASCO
CNL(88)9	Report on the Headquarters Property
CNL(88)10	Audited Accounts - 1987
CNL(88)11	Contributions - 1988
CNL(88)12	Outline of 1989 Draft Budget and 1990 Forecast Budget
CNL(88)13	Report of the ICES North Atlantic Salmon Working Group
CNL(88)14	Report of the ACFM
CNL(88)15	Catch Statistic Returns by the Parties
CNL(88)16	Preliminary Report on Analysis of Catch Statistics
CNL(88)17	Preliminary Report on Laws, Regulations and Programmes
CNL(88)18	ICES Compilation for NASCO of Microtag, Finclip and External Tag Releases in 1987
CNL(88)19	A central repository for tag information
CNL(88)20	A NASCO lottery for tag returns
CNL(88)21	Potential threats to wild stocks from aquaculture
CNL(88)22	Returns under Articles 14 & 15 of the Convention
CNL(88)23	Report on the activities of the North Atlantic Salmon Conservation Organization in 1987

CNL(88)24	Dates and places of 1989 and 1990 meetings
CNL(88)25	List of participants
CNL(88)26	Further Applications for Non-Government Observer Status to NASCO
CNL(88)27	Draft Decision of the Council to modify Staff Rule 8.2
CNL(88)28	Synopsis of Activities to Date of the North American Commission's Bilateral Scientific Working Group on Salmonid Introductions and Transfers
CNL(88)29	Draft Decision of the Council to extend the contract of the Secretary
CNL(88)30	Draft Report of the Fifth Annual Meeting
CNL(88)31	Draft Press Release
CNL(88)32	Draft Decision of the Council on the appointment of Auditors
CNL(88)33	Statement from the Norwegian delegation on potential threats to wild stocks from aquaculture
CNL(88)34	Norwegian statement on the Norwegian membership to the WGC
CNL(88)35	Draft Decision of the Council to request scientific advice from ICES
CNL(88)36	Draft Return of Official catch statistics
CNL(88)37	Draft Decision of the Council on the establishment of a NASCO lottery for tag returns
CNL(88)38	Press Release - NASCO Council elects its new President and Vice-President
CNL(88)39	Decision of the Council on the establishment of a NASCO lottery for tag returns
CNL(88)40	Draft Decision of the Council to request scientific advice from ICES
CNL(88)41	Not issued
CNL(88)42	Press Release
CNL(88)43	Agenda
CNL(88)44	Report of the Fifth Annual Meeting of the Council
CNL(88)45	Not issued
CNL(88)46	Decision of the Council to modify Staff Rule 8.2
CNL(88)47	1989 Budget and 1990 Forecast Budget

CNL(88)48	Decision of the Council to request scientific advice from ICES
CNL(88)49	Decision of the Council to extend the contract of the Secretary
FAC(88)7	1989 Draft Budget and 1990 Forecast Budget

NOTE: This list contains all papers submitted to the Council prior to and at the meeting. Some but not all of these papers are included in this report as annexes.

POST-SCRIPT

CLOSING REMARKS MADE BY THE PRESIDENT

I know you will forgive me if I use a few moments to reflect on my experiences in NASCO on my last day, indeed my last hour, in office. I have been moved by the many kind words addressed to me by delegates during this week.

I cannot deny that NASCO has been an important part of my professional life during these past eight years beginning with the preparatory meetings, then the Conference here in Reykjavik, then further meetings in Edinburgh before the Organization began its work and finally at Annual Meetings of the Organization.

I should add that it has provided an opportunity for me and my family to become acquainted with the warm and hospitable people of Scotland. Although Scotland is one of our nearest neighbours we might nevertheless have gone some years without that opportunity.

My involvement with NASCO has been of an unexpectedly comprehensive nature. When I began we were very much a one-horse show. I recall that in our first days we went down to the Royal Bank of Scotland to establish a bank account in my own name to get the Organization started. Fortunately that situation didn't last long as we soon appointed our Secretary, Dr Malcolm Windsor. I have enjoyed with Dr Windsor the most successful professional relationship imaginable during our work together when we had for many periods almost daily contact. I thank him for that and I will sorely miss our contacts which, however, I know will continue between our families on a personal basis.

What I shall in fact remember most clearly from the work of NASCO is its teamwork nature. I began my career in international affairs as an official of the United Nations and was thus, in a way, a professional internationalist. When speaking in favour of the role of the United Nations I pointed out that whatever else might be said it was useful for representatives of various States to communicate, as they did at the United Nations, and to become acquainted with one another's interests. I recall discussing this with an experienced Arab diplomat who challenged my theory by pointing to the many disputes in the world where the participants knew only too well the interests of each other.

I think in our Organization we have gone against the Arab diplomat's pessimistic view of international relations. Admittedly, our Organization is unique and it may not be safe to generalize into other facets of international life. We have succeeded in addressing the difficult issues within our mandate. We have done so by establishing bonds of friendship and sincerely taking account of the views of others with full knowledge and understanding of the issues involved.

We have succeeded because of each and every one of you. As I look around this room I see a group of friends whom I will sincerely miss. So I assure you that I leave you with a great feeling of sadness, but with confidence also that the Organization is in good hands with our Secretary and his fellow members of the Secretariat and with the Presidency in the hands of Allan Peterson and the Vice Presidency in the hands of Svein Aage Mehli.

I wish you the very best of success in the future.

I join Minister Helgason in wishing you a safe return to your homes and I declare this Fifth Annual Meeting of the Council of NASCO closed.