1996

THIRTEENTH ANNUAL MEETINGS

GOTHENBURG, SWEDEN

10-14 JUNE 1996

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REPORT OF THE

THIRTEENTH ANNUAL MEETING

OF THE

NORTH AMERICAN COMMISSION

10-14 JUNE 1996
GOTHENBURG, SWEDEN

CHAIRMAN:	MR JEAN-PAUL DUGUAY (CANADA)
VICE-CHAIRMAN:	DR RAY B OWEN, JR. (USA)
RAPPORTEUR:	MS KIMBERLY BLANKENBEKER (USA)
SECRETARY:	DR MALCOLM WINDSOR

NAC(96)11

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NAC(96)11

REPORT OF THE THIRTEENTH ANNUAL MEETING OF THE NORTH AMERICAN COMMISSION OF THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION 10-14 JUNE 1996, SWEDISH EXHIBITION AND CONGRESS CENTRE GOTHENBURG, SWEDEN

1. OPENING OF THE MEETING

1.1 Due to the absence of the Chairman, Mr Jean-Paul Duguay (Canada), the Thirteenth Annual Meeting of the North American Commission (NAC) was opened by the Vice-Chairman, Dr Ray B Owen, Jr. (USA). Dr Owen welcomed delegates to Gothenburg.

1.2 A list of participants at the Thirteenth Annual Meeting of the Council and the Commissions is included on page 191 of this document.

2. ADOPTION OF THE AGENDA

2.1 The Commission adopted its agenda, NAC(96)10, (Annex 1).

3. NOMINATION OF A RAPPORTEUR

3.1 Ms. Kimberly Blankenbeker (USA) served as Rapporteur.

4. ELECTION OF OFFICERS

4.1 The Commission elected Dr Ray B Owen, Jr. (USA) as Chairman for a two-year term.

4.2 The Commission elected Mr Pierre Tremblay (Canada) as Vice-Chairman.

5. REVIEW OF THE 1995 FISHERY AND ACFM REPORT FROM ICES ON SALMON STOCKS IN THE COMMISSION AREA

5.1 The representative of ICES, the Chairman of the ACFM, Mr Eskild Kirkegaard, gave a brief overview of the scientific advice from ICES relevant to the NAC area (CNL(96)15). The ACFM report from ICES, which contains the scientific advice relevant to all Commissions, is included on page 149 of this document. He noted that the nominal catches had been declining since 1987 in the NAC area and were at record low levels in 1995. He commented that the United States had no commercial salmon fisheries in 1995 and its recreational fishery caught and released 370 salmon. In Canada, the recreational and commercial catches were very low in 1995; however, there was little change in their relative proportions. He also noted that the St. Pierre et Miquelon fishery had a reported catch of 414 kg.

5.2 The representative of ICES explained that ICES had been asked by NASCO to evaluate the effect of quota management measures and closures implemented after 1991 in the Canadian commercial fisheries. He noted that in Newfoundland the commercial fishery is under a five-year moratorium. Thus, it could be expected that

there would be an increase in the salmon returns. However, there has been no indication of such an increase. He commented that the gains made by closing the fishery may have been lost somewhere else in the salmon's lifecycle. Regarding Labrador, he noted that there had been a decline in the exploitation rate of small salmon and that catches in this area had been reduced substantially in recent years. He commented that it is difficult to know what the condition of the stocks would have been without strict quota measures; however, it seemed clear that the measures have had a major positive impact.

5.3 The representative of ICES noted that the estimates of prefishery abundance of non-maturing and maturing 1 sea winter (SW) fish were at record low levels in 1995, and that there had been a steady increase in the proportion of the North American stock maturing as 1SW fish. In most regions, 1SW and 2SW fish were near the lower end of a 25 year series; however, the 2SW salmon spawners in Labrador in 1995 were the best in the time series. He commented that only in a portion of Newfoundland and in the Gulf of St. Lawrence were spawning escapement targets for 2SW fish exceeded in 1995. Regarding egg deposition, he stated that 22 of 73 rivers had achieved target deposition levels. He further commented that for Canada, the overall 2SW spawning escapement target could have been met or exceeded in only 3 of the past 25 years. In the remaining years, spawning targets could not have been met even if all in-river harvests had been eliminated.

5.4 The representative of ICES discussed the comparison of observed and predicted prefishery abundance values. He explained that the single variable model (using only the thermal habitat index) had been used to calculate prefishery abundance in recent years, but that it had been overestimating. This year, to improve the estimate, the model had been updated to include an index of stock size as well as the thermal index. The two-variable model may still overestimate prefishery abundance; however, the updated model results in improved error structures over the single variable model and is more biologically sound. The representative of ICES stressed that it was appropriate to use the updated model. He noted that the updated model predicts that prefishery abundance will be at low levels again next year.

5.5 The representative of ICES summarized that prefishery abundance was reaching very low levels and that the spawning target had been revised downward to 180,495 fish. He reported that the recommendation from ICES was that fishing mortality on salmon in the West Greenland and North American Commission areas should be reduced to the lowest possible level; and that there should be no landings of salmon from the WGC area in 1996 and no landing of salmon from the NAC area in 1996 and 1997, except for in-river harvests from stocks in individual rivers which are above biologically-based escapement targets.

5.6 The representative of Canada asked the representative of ICES to clarify how the closure of the Newfoundland fishery had made a significant difference in the conservation of salmon when the fish did not seem to be showing up as expected. The representative of ICES explained that if there had been a fishery, it could be assumed that a certain number of additional fish would have been harvested. As there was no fishery, the assumption was that returns would increase; however, there has not been a corresponding increase in actual returns.

5.7 The representative of the United States added that the expectation of increased returns assumes conditions are constant. However, the analysis is not conclusive that there were no fish saved by the Canadian moratorium. He noted that it is unclear what might have happened had there been a Newfoundland fishery, but the moratorium probably eased the pressure on the stock by reducing one component of mortality. He expressed the view that salmon were saved by the measure even if there was no increase in returns in a given year. The representative of ICES agreed with the statements made by the representative of the United States and added that without the Canadian management measure the situation would probably have been much worse. He noted that the lack of returns in the face of strict management measures may indicate serious problems and that an evaluation of the entire situation should be made.

5.8 The representative of the United States asked the representative of ICES to confirm that the effect of the Canadian moratorium in Newfoundland would be cumulative even though there may not be an obvious positive effect immediately. The representative of ICES responded that, in terms of meeting spawning targets, this statement was true and that a cumulative effect in rivers below spawning targets would be expected.

5.9 The representative of the United States noted that spawning targets in the Gulf of St. Lawrence appear to be exceeded. He pointed out, however, that egg production did not exceed the egg production target. He asked the representative of ICES to clarify this and noted that in the Gulf of St. Lawrence there was a chance that egg production was not exceeded in 1995. He also commented that the picture for the United States was not bright.

5.10 The representative of ICES explained that the egg production figure usually referred to a point estimate and that there was a 50% probability of being above or below that figure. He stated that this was a problem because information concerning individual rivers could not be given. He pointed out that there is not enough information regarding many of the stocks being discussed and noted that many stocks have different stock components.

5.11 The representative of the United States asked the representative of ICES why there appeared to be a dramatic increase in early maturing fish. The representative of ICES stated that it was more likely that there had been a decrease in multi-sea-winter fish, causing the proportion of early maturing fish to increase.

5.12 The Commission recognized the excellent work of ICES and specifically the contribution of the ACFM Chairman, who will be retiring from this post in the near future.

5.13 The representative of the United States summarized his understanding of the information presented by the representative of ICES. First, there are not enough spawners available to meet spawning targets. Second, the impact of management measures can be quite large. Third, the updated model will provide numbers that go up or down in accordance with spawner abundance and environmental conditions, and it makes a more accurate scientific calculation because it uses both spawning abundance and environmental factors. Fourth, the estimates should be viewed in a

precautionary way. The point estimates are likely to be optimistic but clearly the stocks are in grave danger.

5.14 The representative of Canada commented that the news was not good but that it was comforting and perhaps satisfying to know that management measures might be having some positive conservation effects.

6. REVIEW AND DISCUSSION OF THE 1995 CANADIAN AND US SALMON MANAGEMENT MEASURES AS THEY RELATE TO THE MANDATE OF THE COMMISSION AND TO THE FINDINGS OF THE ACFM REPORT FROM ICES

6.1 The representative of the United States informed the Commission that the United States is taking an important step for Atlantic salmon by proposing to list certain Maine populations under the Endangered Species Act. He noted that currently a detailed conservation plan was under development with the State of Maine.

6.2 The representative of Canada explained that no decisions had yet been made regarding Canada's 1996 management measures. He noted that Canada is taking a close look at the advice and that the final decision should be made by the Minister soon.

6.3 The representative of the United States reminded the Commission that management measures will likely have a cumulative effect and that the ICES advice is very clear. He stressed the need to heed that advice. He expressed the view that, consistent with the NASCO mandate, all Parties should be prepared to discuss their management measures. He stressed the importance of discussing regulatory measures so that France (in respect of St. Pierre et Miquelon) could be made aware of and comply with the measures. He stated that the United States intended to present a proposal for a regulatory measure for the NAC area if nothing else was forthcoming.

6.4 The representative of the United States tabled a proposal for a regulatory measure for the mixed stock fishery in the North American Commission area, NAC(96)7 (Annex 2), for consideration by the Commission. This measure proposed the closure of the marine commercial fishery for salmon in Labrador Areas 1 and 2 in 1996 and 1997.

6.5 The representative of Canada responded that Canada's position is as he has stated on a number of previous occasions. He said that Canada strongly agrees with the conservation intent of the proposal and with its science-based approach. He said that over the past several years Canada has taken drastic and painful measures to meet conservation objectives. These measures included retirement of over 6,500 commercial licences at a cost of over 70 million Canadian dollars. The commercial fisheries in Newfoundland and the Maritime provinces have been closed for several years. The representative of Canada, while fully subscribing to the importance of the interception fisheries issue and noting the concern expressed by the United States on this issue, stated that he believed the proposal was inconsistent with the US position on the issue in other areas - namely the Pacific Coast - and this would be a consideration for Canada.

6.6 The representative of Canada said that decisions on the Atlantic salmon fishery in Canada are made by Canada's Minister of Fisheries and Oceans. He is well aware of the scientific advice. This year, as in previous years, the Minister is consulting with all the parties involved in the Labrador fishery, and will be making his decision soon. As in previous years, the management plan for Canada's Atlantic salmon fishery will be forwarded to NASCO as soon as the decisions have been made.

6.7 The representative of the United States acknowledged the steps that Canada has taken to conserve Atlantic salmon but the stocks continue to be in poor shape. He noted that the United States is so concerned over status of salmon returning to U.S. waters that several populations are being proposed for listing under the Endangered Species Act. Regarding Pacific salmon, the representative of the United States reminded the Commission that these species were outside the purview of the NASCO Convention. He requested that the regulatory measure concerning Atlantic salmon be put to a vote.

6.8 The Chairman called for a vote on the proposal. The United States voted in favour of it, and Canada voted against the proposal. The Chair advised the Commission that the measure was not, therefore, adopted.

7. ST. PIERRE ET MIQUELON SALMON FISHERIES

7.1 The Secretary introduced a paper, NAC(96)5 (Annex 3), providing catch statistics for the salmon fisheries on St. Pierre et Miquelon. The catch provided to NASCO for 1995 was 837 kg (364 salmon), the lowest in the period of record dating back to 1987. As in previous years, the Commission recognised a discrepancy between the statistics provided by the Ministère de l'Agriculture et de la Pêche in Paris and those provided by ICES. The ICES figure was 414 kg. The Secretary will again seek clarification on the reasons for the difference.

7.2 The Secretary noted that at last year's meeting the representative of the USA raised the question of membership of France (in respect of St Pierre et Miquelon) in other international fisheries fora and suggested the possibility of encouraging France to do the same within NASCO. The Secretary suggested that there was logic in this idea. He also noted that last year the representative of Canada referred to a new agreement between Canada and France concerning St. Pierre et Miquelon that would limit the fishery by requiring St. Pierre et Miquelon to comply with salmon conservation measures adopted by NASCO. The agreement stipulates that there would be no increase in the catch of salmon originating in other countries' rivers without the consent of the other country.

7.3 The Secretary reminded the Commission that ICES recommended that there should be no landings of fish in the NAC area in 1996 or 1997 and asked the Parties if they wished to take any further action.

7.4 The representative of Canada commented that the France/Canada agreement had been signed and stressed that the agreement specifies that France will abide by the decisions of NASCO regarding management measures. He stated the view that the agreement should make membership by France in NASCO unnecessary.

8. REPORT OF THE NAC SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

8.1 The Co-Chairman of the NAC Scientific Working Group on Salmonid Introductions and Transfers, Mr Rex Porter (Canada), presented a report on the activities of the Group in 1995/96, NAC(96)6, (Annex 4). He pointed out that of the 18 recommendations made by the Working Group, the Commission should specifically address the following three during this meeting: (1) the release of transgenic salmon, (2) minor amendments to the Protocols, and (3) the suggestion that the Protocols be thoroughly reviewed and updated by 1998.

8.2 The representative of the United States noted that the issue of transgenics was raised in the Council and that the recommendations of the Working Group would be helpful as the Council decides where it wants to go with this issue in the future. He commented that the suggested amendments to the Protocols seemed straightforward but that he would like to have an opportunity to review them more closely. He stated that the recommendation that the Protocols be reviewed and simplified into one part was very important and should be completed by 1998 when the Protocols will again be available for amendment. However, he cautioned that care should be taken not to change the substance of the Protocols as this would create problems for the United States domestically. Finally, he commented that the genetics issue was very important and that the results of the upcoming joint ICES/NASCO Symposium would be very helpful in re-writing the Protocols.

8.3 The Commission requested and the Co-Chair of the Working Group agreed to review all relevant information before undertaking any re-writing and that effort should be made to make the Protocols more flexible without altering their substance.

8.4 The representative of Canada endorsed the Working Group's proposals and suggested the need to give the Working Group clear direction regarding the revision of the Protocols. He then questioned whether or not sterile fish were considered genetically modified organisms (GMO).

8.5 The Co-Chair of the Working Group explained that if the fish are sterilized by modifying the genetic material within the fish, then they are considered a GMO. If sterilization is done without gene modification, then the fish is not considered a GMO.

8.6 The representative of Canada noted that reference had been made for several years in the Working Group's report that there is a European strain of salmon being used in Maine. He questioned whether anything could or should be done about it.

8.7 The representative of the United States explained that the Scottish strain was introduced before the current rules existed regarding introductions and transfers. He noted that the strain was maintained on a limited scale and importation of additional material is not allowed. He informed the Commission that the strain is not very good for culture purposes. He noted that current U.S. regulations do not require the destruction of existing stock.

8.8 The Commission thanked the Working Group for its excellent work.

8.9 The Chairman reminded the Commission of the three recommendations that were to be considered in more detail. Regarding the recommendation to revise the Protocols by 1998, the representative of Canada introduced a document, NAC(96)8, that would establish the scope of the work and set out a timetable for it. Concern was raised by the representative of the United States about this document. In particular, he expressed concern that the Working Group was being directed to make substantial changes to the Protocols regarding fish health and genetics. He did not believe that this was appropriate for the reasons already expressed. He suggested changes to the document which were accepted by the representative of Canada. The amended document, NAC(96)9, is contained in Annex 5.

8.10 The Chairman reminded the Commission that the issue of transgenics will be addressed by the Council so further discussion in the Commission was not required. The Chairman also reminded the Commission that there were small changes to a few of the existing Protocols recommended by the Working Group. It was agreed that these should be accepted.

8.11 The Co-Chair of the Working Group agreed with the foregoing comments. He requested that the Secretariat take part in re-writing the Protocols. The Commission agreed to this request.

8.12 The Chairman noted his understanding that there would be consultation between parties regarding nominees to fill the two vacant Working Group positions.

9. RECOMMENDATIONS TO THE COUNCIL ON THE REQUEST TO ICES FOR SCIENTIFIC ADVICE

9.1 At its Ninth Annual Meeting the Commission had appointed Dr Kevin Friedland (USA) and Dr Wilfred Carter (Canada) to represent the Commission on the Standing Scientific Committee.

9.2 The Commission reviewed document SSC(96)6 as presented by the Chairman of the Standing Scientific Committee. He noted that the format for requesting advice had changed somewhat as questions were grouped by Commission. This new format made the request longer but would provide advantages. He also noted that most of the questions concerning the NAC were based on last year's questions, but he noted that there were some new requests.

9.3 The representative of the United States commented that the changes made to the document were helpful, and he recommended endorsing the draft. The representative of Canada agreed. The Commission thanked the Standing Scientific Committee for its work and recommended the document to the Council as part of the annual request to ICES for scientific advice. The request to ICES agreed by the Council, CNL(96)58, is contained in Annex 6.

10. ANNOUNCEMENT OF THE TAG RETURN INCENTIVE SCHEME PRIZE

10.1 The Chairman announced that the draw for prizes in the Tag Return Incentive Scheme was made by the Auditors at NASCO Headquarters on 31 May 1996. The winner of

the Commission's $1,500 prize was Mr Douglas Young of Rothesay, New Brunswick. The Commission offered its congratulations to the winner.

11. OTHER BUSINESS

11.1 There was no other business.

12. DATE AND PLACE OF THE NEXT MEETING

12.1 The Commission agreed to hold its next meeting during the Fourteenth Annual Meeting of the Council, 9-13 June 1997, in Greenland.

13. CONSIDERATION OF THE DRAFT REPORT OF THE MEETING

13.1 The Commission considered a draft report of the meeting, NAC(96)4.

ANNEX 1

NAC(96)10
THIRTEENTH ANNUAL MEETING OF THE
NORTH AMERICAN COMMISSION
10-14 JUNE 1996
SWEDISH EXHIBITION & CONGRESS CENTRE, GOTHENBURG, SWEDEN

AGENDA

1. Opening of the Meeting
2. Adoption of the Agenda
3. Nomination of a Rapporteur
4. Election of Officers
5. Review of the 1995 Fishery and ACFM Report from ICES on Salmon Stocks in the Commission Area
6. Review and Discussion of the 1996 Canadian and US Salmon Management Measures as they relate to the Mandate of the Commission and to the Findings of the ACFM Report from ICES
7. The St Pierre et Miquelon Salmon Fisheries
8. Report of the NAC Scientific Working Group on Salmonid Introductions and Transfers
9. Recommendations to the Council on the Request to ICES for Scientific Advice
10. Announcement of the Tag Return Incentive Scheme Prize
11. Other Business
12. Date and Place of the Next Meeting
13. Consideration of the Draft Report of the Meeting

ANNEX 2

NORTH AMERICAN COMMISSION

NAC(96)7

PROPOSAL BY THE UNITED STATES FOR THE MIXED STOCK FISHERY IN THE NORTH AMERICAN COMMISSION AREA FOR THE YEARS 1996 AND 1997

NAC(96)7

PROPOSAL BY THE UNITED STATES FOR THE MIXED STOCK FISHERY IN THE NORTH AMERICAN COMMISSION AREA FOR THE YEARS 1996 AND 1997

Whereas Article 7 1(b) of the Convention states one of the functions of the North American Commission is "To propose regulatory measures for salmon fisheries under the jurisdiction of a member which harvest amounts of salmon significant to the other member in whose rivers that salmon originates, in order to minimize such harvests;"

Whereas salmon of United States origin are caught in the ocean interceptory fishery in Labrador fishing areas 1 and 2;

Whereas salmon of United States origin caught in Labrador fishing areas 1 and 2 are of significant importance to the United States;

Whereas the scientific advice provided by ICES in the report of the Advisory Committee on Fishery Management, CNL(96)15, advises that the North American stock complex is in a "tenuous condition" and the pre-fishery abundance for North American origin salmon is less than the spawning target;

Whereas ICES has further advised that there be no landings of salmon from the West Greenland Commission area in 1996 and no landings of salmon from the North American Commission area in 1996 and 1997 except for in-river harvest from stocks in rivers which are above biologically based escapement target levels;

The NAC hereby agrees that the marine commercial fishery for salmon in Labrador Areas 1 and 2 will be closed in 1996 and 1997.

ANNEX 3

NORTH AMERICAN COMMISSION

NAC(96)5

THE ST PIERRE ET MIQUELON SALMON FISHERIES

NAC(96)5

THE ST PIERRE ET MIQUELON SALMON FISHERIES

1. At its Seventh Annual Meeting the Commission requested the Secretary to pursue efforts to obtain information about the salmon fisheries on St Pierre et Miquelon. In accordance with this request we have contacted the Ministère de l'Agriculture et de la Pêche in Paris annually with a view to obtaining information on the salmon fisheries according to the format agreed by the North Atlantic Salmon Working Group (CM1988/Assess:16 and CM1988/M:4).

2. We have now received provisional catch data for 1995. The official time series of information as provided by the Ministère de l'Agriculture et de la Pêche is therefore as follows:

	Number	Weight (Tonnes)
1987	442	0.984
1988	813	2.084
1989	971	2.590
1990	884	1.889
1991	573	1.132
1992	1049	2.319
1993	1439	2.943
1994	1656	3.423
1995	364	0.837

3. The provisional catch data for 1995 is the lowest recorded in the time series since 1987, both in terms of number caught and weight. The breakdown of the catch was 170 salmon (392kg) in the commercial fisheries and 194 salmon (445kg) in the recreational fisheries. At its Tenth Annual Meeting the Commission recognised a discrepancy between the official statistics provided by the French Government to NASCO and those provided to ICES. This discrepancy had been raised with the French authorities but to date I have not received any clarification. This year there is again a discrepancy between the ICES figures (414kg) and those provided to NASCO (837kg). The ICES figures do not include the recreational catch of 445kg but there is a small discrepancy between the commercial landings reported by ICES (414kg) and those provided to NASCO (392kg) and I will again pursue the reasons for the discrepancy with the Ministère de l'Agriculture et de la Pêche.

4. Last year the representative of the US raised the question of membership of France (in respect of St Pierre et Miquelon) in other international fisheries fora and suggested that France might be encouraged to do the same within NASCO. The representative of Canada referred to a new agreement between Canada and France concerning St Pierre et Miquelon under which it was agreed that there would be no increase in the catch of salmon originating in other countries' rivers without the consent of the other country. He also indicated that Canada and France were to meet to discuss the implementation of the agreement, since the catch in 1994 had increased compared to

the previous year. A copy of the agreement was made available to the Commission through the Secretariat.

5. In view of the recommendation from ICES that there should be no landings of salmon from the North American Commission area in 1996 and 1997, except for in-river harvests from stocks in individual rivers which are above biologically-based escapement targets, the Commission might like to consider whether the present bilateral arrangement concerning St Pierre et Miquelon is satisfactory or whether it wishes to pursue the question of membership of France (in respect of St Pierre et Miquelón).

Secretary
Edinburgh
4 June 1996

ANNEX 4

NORTH AMERICAN COMMISSION

NAC(96)6

REPORT OF ACTIVITIES 1995/96
NAC SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

REPORT OF ACTIVITIES 1995/1996
NAC SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

Members:

Rex Porter (Canada Co-chair)
Tim Carey (Canada)
Vacant (Canada)

Dan C. Kimball (USA Co-chair)
Chris Mantzaris (USA)
Vacant (USA)

The Scientific Working Group was asked by the NAC at its June 1995 Annual Meeting for advice on three issues (Attachment I). The Scientific Working Group did not meet this year due to travel and funding constraints, but carried out the tasks requested by NAC through telephone and electronic exchanges. The Working Group established a Genetics Subgroup to assist in responding to Task #2, and a Fish Health Subgroup relative to Task #3. The Terms of Reference and memberships of the two Subgroups are included with the draft reports received from the Sub-groups (Attachments II and III).

Task #1 Provide an update of the inventory of Introductions and Transfers of Salmonids in the Commission Area

Reports of the 1995 salmonid introductions and transfers were received from all agencies responsible for authorizing shipments of salmonids within the NAC Area of Canada and USA; and information was entered into the data base which extends back to 1986 (Attachment IV). Introductions and transfers of salmonids occurred only in the State of Maine and the six Canadian Provinces with drainage to the Atlantic Ocean. A brief summary of the introductions and transfers which crossed Provincial or State borders is as follows:

SPECIES	NUMBER OF EGGS OR FISH MOVED	NUMBER OF SHIPMENTS
Rainbow trout	6,303,700	63
Atlantic salmon	3,075,410	36
Arctic charr	338,500	6
Brook trout	421,000	5
Lake trout	8,000	1
Coho	20,000	1

All transfers appeared to meet the intent of the protocols except for the transfer of 25,000 Atlantic salmon parr (10 gram) of Saint John strain which were imported to Bay d'Espoir, Newfoundland from Maine, for marine cage rearing. According to the protocols for Zone II, non-indigenous stocks used in cage rearing should be reproductively sterile. It should also be noted that Canada had seven shipments of rainbow trout from Washington State, which is west of the continental divide; however the donor facility has had a long history of disease-free status and therefore meets the requirements under the protocols. The shipment of coho from B.C. was for vaccine development; and the fish are held in quarantine and will be destroyed.

Most of the transfers and introductions were for aquaculture purposes, small numbers of fish were for bioassay or research, and a couple of shipments were for fish-out ponds.

The Scientific Working Group notes that the continuing practise of cage rearing of European strain salmon in the Maine and the cage rearing of Saint John strains of salmon in Newfoundland are contrary to the NAC Protocols. These deviations from the Protocols expose the nearby wild salmon populations to elevated risk of reduction in genetic diversity and fitness. **The Working Group recommends that the Protocol prohibiting the use of European strains of Atlantic salmon in the NAC Area and the Protocol which requires non-local strains used in cage rearing to be reproductively sterile, should be maintained. Deviations from the use of non-local strains should have adequate acceptable safeguards to prevent interaction with wild stocks.**

The Working Group recommends that in the Protocols, Part I, Section 3.1 (2), the statement ".. acceptable history of disease testing demonstrating the absence of IHN", which allows fish to be shipped from a facility in an IHN-affected area to the NAC area, be explicitly defined and incorporated into the Protocols.

Task #2 Provide an update on the status of scientific knowledge on the effects on wild stocks of using non-local strains and/or genetically modified salmon in cage-rearing

Non-local strains

There has been little advancement in scientific knowledge on the effects of using non-local strains of salmon in marine and freshwater rearing. Very little empirically-derived genetic data exists on the interactions between non-local strains and wild Atlantic salmon. The genetic consequences of these interactions are difficult to predict due to the difficulty in estimating the extent of gene flow and the potential impact on wild stocks. All one can do is assess the changes in gene frequencies and speculate as to the impacts on wild populations.

If the genetic differences between local and non-local strains are large, substantial reductions in productivity may occur in the short term because of outbreeding depression; however, reduced survival of non-local strains and their introgressed hybrids may help to limit the extent of the impact. More modest genetic differences may not result in large, short term reductions in productivity, but persistent gene flow would cause a replacement of local genes with non-native ones.

The genetic effects of introgressive hybridization are permanent and are likely to change historical genetic states. If introgressive hybridization ceases, wild populations may recover lost fitness over time, but not genetic diversity or loss alleles.

Introgressive hybridization can be beneficial under some circumstances: 1) foreign genes may mask the effects of deleterious recessive alleles in inbred populations; 2) Initially introgressive hybridization will generally increase genetic diversity in local populations. However there is a trade-off between increases in genetic diversity and loss of adaptive fitness within a population, and the result of continued introgression may be a reduction in within and between population diversity.

One of the criticisms of the Protocols has been the large area covered by each of the Zones. Decisions have to be made on which strains of salmon are acceptable within a specific geographical area within a Zone. The Working Group recognizes the lack of empirical data to be able to predict the genetic consequences on wild stocks of escaped domestic strains. In the absence of such information, restrictions on the importation of foreign strains or distant stocks are probably the most prudent and conservative measure. Domestic strains developed from local stocks are probably more similar in terms of genetics than domestic strains developed from distant stocks. The Genetics Sub-group has indicated that molecular genetic technology has advanced to the point where it should be possible to classify river stocks and domestic strains on the same scale of genetic similarity. It may therefore be possible to place limits on the genetic distance allowable between a domestic strain and any given wild stock. This would lead to a continuum of allowable domestic strains over the species range and also cover the possibility of a discontinuous distribution of salmon genotypes. **The Working Group recommends that this approach be further developed by the Genetics Sub-group.**

Genetically modified

Genetically modified fish includes polyploid, transgenic and /or all-male or all-female strains, but not selected strains.

The aquaculture industry is hesitant to publicly endorse the use of transgenic technology for fear of consumer resistance. In eastern Canada, one company has been working for more than five years on protocols for the development of a transgenic Atlantic salmon; but it appears to be a long way from field. Transgenic salmon could potentially pose a risk of adverse effects on wild Atlantic salmon if allowed to hybridize.

There has been significant research in both triploid and single sex populations of Atlantic salmon. Triploids are functionally sterile but their performance has not yet met aquaculture industry standards. Triploids have higher mortalities, deformity problems, and do not compete well with diploids in the same cage. Triploids that survive to harvest seem to be larger, on average, than diploids but that may be a result of size-related mortality. In most cases, the performance problems have resulted in a termination of most research to evaluate the efficacy of all-female strains. Triploids hold promise for aquaculture but there are a number of technical difficulties to overcome. Triploidy as a form of reproductive sterility would only be truly effective with all-female strains. Triploid males are functionally sterile but they undergo sexual maturation. They will spawn with diploid females but the fertilized eggs will not survive.

All-female populations are the only single sex strains that would be of interest to the aquaculture industry. All-female diploid strains reduce grilsing and any escapees would have to mate with a wild male to reproduce.

The Working Group recommends that: 1) NAC encourage NASCO member countries to conduct research to address the problems that currently prevent industry from accepting polyploid stocks for aquaculture use; 2) NAC endorse the recommended procedures to follow when considering the release of genetically modified organisms (GMOs) as outlined in the ICES Code of Practise on the Introductions and Transfers of Marine Organisms, 1994. The recommended procedure includes "..member countries to establish strong legal measures to regulate such (GMOs) releases.."; "Member countries contemplating any release of GMOs .. notify the Council before such releases are made. This

notification shall include a risk assessment..."; and "whenever feasible initial releases of GMOs be reproductively sterile..".

Other Genetic Considerations

The Scientific Working Group, with advice from the Genetics Sub-group, considered three other genetics-related issues pertaining to the NAC Protocols:

1) **A request was received from the Nova Scotia Fin Fish Farmers Association: "Within Zone II, rainbow trout, Arctic Charr, striped bass, domestic Atlantic salmon, and other species should not be considered non-indigenous until it is proven that potential adverse impacts of these introductions significantly outweigh economic benefits of their uses in aquaculture."**

The definition of indigenous and non-indigenous should not be changed. However, the Protocols already state that an introduced species which has been established for ten years or more would be treated as indigenous. The intent here is not to change the definition but, **for management purposes,** to treat a species or strain that has been naturally reproducing in the wild for 10 or more years with the same Protocols as indigenous species. Although not specifically mentioned in the Protocols, introduced non-indigenous strains would be given the same consideration.

Striped bass are indigenous to some rivers of Nova Scotia and New Brunswick, but are known to be predators on salmonids. Thus their use in cage rearing operations will result in fish escaping and lead to a larger population (and predation) than current wild populations. Hybrid bass, which is the preferred aquaculture candidate, may prove to be more aggressive than the indigenous population.

The Working Group recommends: 1) Industry or an Association should provide the biological rationale (or interactions risk assessment) to NAC for consideration if they believe that a non-indigenous species or stock should be governed by the same protocols as an indigenous species; 2) domestic non-local Atlantic salmon stocks should not be treated (for management purposes) as an indigenous wild stock.

2) **The appropriateness of the Protocol for Zone II which requires that non-indigenous salmon stocks in cage culture be reproductively sterile. (Several requests have been made by industry to change this protocol).**

The intent of the protocol is to prevent genetic interaction (spawning) between non-indigenous escapees and wild stocks. There is no new information to change this intent. However, it may be possible to develop measures to effectively contain fish so that they do not escape or recapture fish after they escape. Consideration could be given to changing the wording to "reproductively sterile or measures that will prevent interactions with wild salmon". However, the Working Group is not aware of any such measures which could be put in place. The present cage structures used by industry often result in many fish escaping and no adequate recapture technique has been put forth. **The Working Group thus recommends that the protocol "Non-indigenous salmon stocks may be introduced into the wild or used in cage rearing operations if the fish are reproductively sterile and the risk of adverse ecological interactions is minimal" not be changed until evidence is provided of**

containment measures or any other measures which will prevent aquaculture fish from interacting with wild salmon.

3) Review the 30 km and 20 km exclusion areas referenced in the Protocols.

The intent of the protocol is to prevent straying by aquaculture escapees into Class I and Class II rivers. These distances were arbitrary values previously recommended by the Working Group. There is evidence that escapees will stray a greater distance than 30 km. **The Working Group recommends that flexibility be adopted in applying the protocols related to the 30 km and 20 km exclusion areas such that the exclusion zone can be established on a river by river basis and still maintain a low risk of escapees straying to the river.** It may be appropriate that some rivers have a smaller or larger exclusion zone depending on the geography of the coastline. **The Working Group recommends consideration be given to rewording this criteria when the Protocols are re-written.**

There was no scientific information provided by the Genetics Sub-group to warrant changing the Protocols at the present time. The Working Group is aware of the ICES/NASCO Symposium on "Interactions between Salmon Culture and Wild Stocks of Atlantic Salmon: Scientific and Management Issues" which may provide new information. **It is therefore recommended that the Protocols be reviewed again after the Symposium giving consideration to any new information that may be presented.**

Task #3 Provide a review of the fish health aspects of NAC Protocols in light of current reviews being undertaken by Canadian Fish Health Regulations, New England Salmonid Health Guidelines, US Title 50, and US Fish and Wildlife Fish Health Policy

There are no major changes recommended to the fish health related items in the Protocols that would warrant a re-write at this time. The Canadian Scientists on the Fish Health Sub-group questioned the need for NAC Protocols to deal with fish health issues given the many varied federal, state, and provincial regulations. However, they did not provide a review of the regulations to show if the regulations all met the requirements set out in the NAC Protocols. The Canadian scientists did suggest some issues that needed to be addressed if the Protocols are maintained; but they did not recommend what the changes should be. **The Scientific Working Group supports maintaining the Protocols pertaining to Fish Health at this time to ensure a basic standardization of regulations which are necessary to protect wild Atlantic salmon populations.**

The New England Fish Health Guidelines and the Canadian Fish Health Protection Regulations are currently under active revision as are other local policies, such as in the State of Maine. **The Working Group recommends that, since many of these revisions are near completion, it would be appropriate to postpone any major re-write of the Protocols at this time.** The NAC Protocols are supposed to be reviewed every two years for possible amendments. Since it is a time-consuming process to revise the Protocols the review should be initiated before the next annual meeting with the intent that a re-write of the Protocols be completed for the 1998 annual meeting. This would also allow enough time for the Working Group and Sub-groups to meet and recommend changes to the protocols as well as provide NAC member countries to get consult with public/industry prior to the Working Group's submission to NAC.

However, the Working Group does recommend some modifications to the Protocols which should be adopted by NAC, and transmitted by letter to the regulating agencies for immediate implementation. There are other recommendations for consideration in the next major re-write of the Protocols.

Recommendations for immediate implementation

- To clarify the wording relative to the applications of Zones, to Part 2, Section 5, add:

  "Protocols for the transfer of salmonid fish or eyed eggs described in Part 2, Section 5 are to be applied under the restrictions for Zones I, II, and III that are listed in Part I, Section 3 "PROTOCOLS"."

- Annex IX (4) should be changed to "*All discharges must be in compliance with Federal, state, and/or provincial regulations.*"

For consideration for future re-write of Protocols

- Part II, Section 7(ii) should clarify if fish health inspectors must be "certified", either under American Fishery Society guidelines or Canadian Fish Health Protection regulations.

- The prohibition of imports from geographic areas enzootic for IHN should be expanded to cover VHS and OMV diseases. A map of specific enzootic areas (states, watersheds, etc.) should be included in the Protocols. Strict procedures should be developed for any granting of exceptions to the prohibitions for using "disease free" sources of eggs located within these geographic areas.

- Develop a list of important scientific informational needs relative to fish health issues in the NAC Area to aid governmental and institutional researchers in identifying priority research needs.

The State of Maine has recently developed a fish health policy that will serve as a protocol for state agencies issuing permits for the transfer of salmonids within the state. These guidelines, upon initial review, appear to equal or exceed the Protocols relative to controlling fish pathogen transfers. A similar document governing permits for importations of salmonids into Maine is under way and will probably be more stringent than the new within-state policy. The USA Federal Agency, the National Marine Fisheries Service, has initiated the process of implementing the Protocols through federal regulations. The federal process initially requires the agency to prepare an Environmental Impact Statement, which is underway. The total regulatory process will require some length of time to complete.

Summary of Recommendations extracted from above:

1) **The Protocol prohibiting the use of European strains of Atlantic salmon in the NAC Area and the Protocol which requires non-local strains used in cage rearing to be reproductively sterile, should be maintained. Deviations from the use of non-local strains should have adequate acceptable safeguards to prevent interaction with wild stocks.**

2) In the Protocols, Part I, Section 3.1 (2), the statement ".. acceptable history of disease testing demonstrating the absence of IHN", which allows fish to be shipped from a facility in an IHN-affected area to the NAC area, be explicitly defined and incorporated into the Protocols.

3) The Working Group, with support from the Genetics Sub-group, develop a system to classify river stocks and domestic strains on the same scale of genetic similarity. This system would recommend limits on the genetic distance allowable between a domestic strain used in aquaculture and any given wild stock.

4) NAC encourage NASCO member countries to conduct research to address the problems that currently prevent industry from accepting polyploid stocks for aquaculture use.

5) NAC endorse the recommended procedure for the consideration of release of genetically modified organisms (GMOs) as outlined in the ICES Code of Practice on the Introductions and Transfers of Marine Organisms, 1994. The recommended procedure includes ".. member countries to establish strong legal measures to regulate such (GMOs) releases .."; "Member countries contemplating any release of GMOs .. notify the Council before such releases are made. This notification shall include a risk assessment..."; and "whenever feasible initial releases of GMOs be reproductively sterile..".

6) Industry or an Association should provide the biological rationale (or interactions risk assessment) to NAC for consideration if they believe that a non-indigenous species or stock should be governed by the same protocols as an indigenous species.

7) Domestic non-local Atlantic salmon stocks should not be treated (for management purposes) as an indigenous wild stock.

8) The protocol "Non-indigenous salmon stocks may be introduced into the wild or used in cage rearing operations if the fish are reproductively sterile and the risk of adverse ecological interactions is minimal" should not be changed until evidence is provided of containment measures or any other measures which will prevent aquaculture fish from interacting with wild salmon.

9) Flexibility should be adopted in applying the protocols related to the 30 km and 20 km exclusion areas such that the exclusion zone can be established on a river by river basis and still maintain a low risk of straying of escapees to the river.

10) Consideration be given to rewording the criteria referenced in Recommendation 9, when the Protocols are re-revised.

11) The genetics aspects of the Protocols should be reviewed with consideration to the information provided at the ICES/NASCO Symposium, April 1997.

12) Protocols pertaining to Fish Health should be maintained, at this time, to ensure a basic standardization of regulations which are necessary to protect wild Atlantic salmon populations. Since several agencies are presently revising their fish health

regulations, it would be appropriate to postpone any major re-write of the Protocols until these revisions are completed.

13) The following amendments to the fish health aspects of the Protocols should be adopted by NAC and conveyed to regulatory agencies for implementation:

- To clarify the wording relative to the applications of Zones, to Part 2, Section 5, add:

  "Protocols for the transfer of salmonid fish or eyed eggs described in Part 2, Section 5 are to be applied under the restrictions for Zones I, II, and III that are listed in Part I, Section 3 "PROTOCOLS"."

- Change Annex IX (4) to "*All discharges must be in compliance with Federal, state, and/or provincial regulations.*"

14) The following amendments should be considered to the Fish Health aspects of the Protocols during the next re-write:

- Part II, Section 7(ii) should clarify if fish health inspectors must be "certified", either under American Fishery Society guidelines or Canadian Fish Health Protection regulations.

- The prohibition of imports from some areas enzootic for IHN should be expanded to cover VHS and OMV diseases. A map of specific enzootic areas (states, watersheds, etc.) should be included in the Protocols. Procedures should be developed for any granting of exceptions to the prohibitions for using "disease free" sources of eggs located within these geographic areas.

15) A list of important scientific information needs relative to fish health issues in the NAC Area should be developed to aid governmental and institutional researchers in identifying priority research needs.

Other Recommendations:

16) The next review of the Protocols for the Introduction and Transfer of Salmonids is scheduled for 1998. The Working Group feels that the charge by NAC for this review should be given now to allow the maximum amount of time for a thorough review and update of the Protocols, with an opportunity for NAC member countries to seek public input.

17) The deviations from the protocols which are occurring in USA and Canada should be addressed.

18) The two vacancies on the Working Group should be filled. The amount of time required to perform a proper review in this era of agency streamlining and resultant increases in workload makes it desirable to fill these vacancies soon.

ATTACHMENT I

NORTH AMERICAN COMMISSION

NAC(95)9

NORTH AMERICAN COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE TO THE SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

1. Provide an update of the inventory of the introduction and transfer of salmonids in the NAC Area and rivers flowing into the NAC Area. Advise on deviations from the NAC Protocols.

2. Provide an update on the status of scientific knowledge on the effects on wild salmon stocks, of using non-local strains of salmon and/or genetically modified salmon in marine and freshwater cage-rearing.

3. Provide a review of the fish health aspects of the NAC Protocols in light of the current reviews which are being undertaken of the Canadian Fish Health Protection Regulations, the New England Fish Health Guidelines, and amendments to the US Title 50 and the latest revision to the Fish Health Policy of the US Fish and Wildlife Service.

ATTACHMENT II
Draft Only

NORTH AMERICAN COMMISSION
GENETICS SUBGROUP
SCIENTIFIC WORKING GROUP ON
SALMONID INTRODUCTIONS AND TRANSFERS

Biological Station, St Andrews, NB
May 22, 1996

Genetics Subgroup

In Attendance

John Bailey, Canada Co-chairman
Atlantic Salmon Federation
St Andrews, NB

Tillmann Benfey
University of New Brunswick
Fredericton, NB

William Davidson
Memorial University of Newfoundland
St John's, NF

Dan Kimball
US Fish and Wildlife Service
Hadley, MA

Jeff Hutchings
Dalhousie University
Halifax, NS

Richard Saunders
Department of Fisheries and Oceans
St Andrews, NB

Tim King, United States Co-chairman
National Biological Service
Kearneysville, West Virginia

Rex Porter
Department of Fisheries and Oceans
Saint John's, NF

Not present

Brian Glebe
Connors Bros Limited
Blacks Harbour, NB

Shirley Roach-Albert
Stolt Sea Farm Inc
Saint John, NB

Brian Riddell
Department of Fisheries and Oceans
Nanaimo, BC

1. **Provide an update on the status of scientific knowledge on the effects of using non-local strains of salmon and/or genetically modified salmon in marine and freshwater cage-rearing.**

NON-LOCAL STRAINS

There has been little advancement in the scientific knowledge of the effects of using non-local strains of salmon in marine and freshwater rearing. The response provided

by Tim King and the US Delegation is both thorough and up to date. There is little to add to the knowledge base.

A recent thesis by Carr (1995) reports that aquaculture escapees have accounted for more than half of the 500+ salmon which have ascended the fish ladder at the mouth of the Magaguadavic River during each of the past two years. DNA analyses from scales collected in the mid 1970's (before there was an aquaculture industry) and in recent years show that there have been measurable genetic changes in the population. However, it is difficult to draw a firm conclusion that this has been caused solely by the introgression of genes from fish which escaped from sea cages. The original samples were small and may not have been representative of the wild gene pool. In addition, there are three smolt-producing hatcheries located in the Magaguadavic drainage basin. Fry or parr, which escaped from these hatcheries may have also contributed to the 'wild' gene pool. To my knowledge, there has been no measurable change in phenotype of the Magaguadavic population over the past 20 years.

GENETICALLY MODIFIED

According to a definition adopted by NASCO in February, 1996, genetically modified fish include polyploid, transgenic and/or all-male or all-female strains, but not select strains.

The aquaculture industry is hesitant to publicly endorse the use of transgenic technology. Fear of consumer resistance is the primary reason. There has been one company working on protocols for more than five years but they appear to be a long way from field testing transgenic fish. Undoubtedly, there will be a number of bureaucratic and technological hurdles to any field testing (including reproductive sterility) and this is not considered an urgent concern.

There has been significant research in both triploid and single-sex populations. Triploids are functionally sterile but their productivity does not yet meet aquaculture industry standards. Triploids have higher mortalities, deformity problems (particularly in North America and Tasmania), and do not compete well with diploid salmon in the same cage. Triploids that survive to harvest tend to be larger, on average, than diploids but that may be the result of size-related mortality. The majority of triploid studies have been conducted on mixed-sex strains. In most cases, the performance problems associated with triploids caused a termination of further research to evaluate the efficacy of all-female, triploid strains. Triploids are thought to hold promise for aquaculture but there are still a number of technical difficulties to overcome before they can compete in an economic context with diploid salmon.

Although two generations are required, the production of single-sex populations is relatively straightforward. All-female populations are the only single-sex strains that would be of interest to the aquaculture industry. All-female diploid strains would reduce grilsing and any fish which did escape would have to mate with wild males in order to reproduce. It is interesting to note that in British Columbia, all-female, Atlantic salmon strains are considered to be reproductively sterile. Triploidy, as a form of reproductive sterility would only be truly effective with all-female strains. Triploid

males, although functionally sterile, undergo sexual maturation and will spawn with mature diploid females. The escapement of triploid males from aquaculture has the potential to significantly reduce spawning success in wild populations.

2. **With consideration to the potential for adverse genetic effects on wild salmon stocks, comment on the following request from the Nova Scotia Fish Farmers' Association.**

"Within Zone II, rainbow trout, brown trout, Arctic charr, striped bass, domestic Atlantic salmon, and other species should not be considered non-indigenous until it is proven that potential adverse impacts of these introductions significantly outweigh economic benefits of their use in aquaculture".

This rationale behind this "request" was difficult to fathom. Firstly, it is beyond the scope of this Committee to recommend a change to the definition of non-indigenous. Secondly, NASCO is concerned with salmon, but has a secondary concern with introductions of other species that may impact on wild salmon.

Striped bass are both indigenous to Zone II and a potential aquaculture species. This poses a problem more complex than that of a non-indigenous introduction. Striped bass are salmon predators and increased aquaculture may lead to larger than current wild (free ranging) populations. Hybrid bass are preferred aquaculture candidates may prove to be even more aggressive salmon predators than indigenous populations.

Naturally reproducing populations of rainbow trout, brown trout and Arctic charr can all be found in Zone II. From a management perspective, these populations are treated as indigenous. NASCO, too, states that introduced species will be treated as indigenous if it has been established for more than ten years.

Perhaps it would be more appropriate to call successful introductions of non-indigenous species "naturalized" or "introduced" species. Management of "naturalized" populations could be similar to that for indigenous populations. However, such a distinction might make it easier to enact and enforce legislation which limits further naturalization.

3. **Comment on the appropriateness of the protocol for Zone II which requires that non-indigenous salmon stocks in cage culture be reproductively sterile (several requests have been made to change this protocol).**

The intent of the protocol is to prevent genetic interactions (spawning) between non-indigenous aquaculture escapees and wild stocks. Certainly this can be accomplished by only allowing reproductively sterile fish in aquaculture. However, to prevent spawning, fish don't have to be sterile. The sub-committee recommends that "reproductively sterile" be changed to "effectively contained or reproductively sterile". Effective containment could be translated into an operational definition that includes requirements for cage construction, mesh strength, mesh size, double caging, etc. This change in protocol would "leave a door open" for aquaculture in Zone II. The onus should be on the operator to convince the regulatory agencies that his containment will be secure.

4. **Are the 30km and 20km exclusion areas referenced in the Protocols reasonable?**

The intent of the protocol is to prevent straying by aquaculture escapees into Class I and II rivers. The distances are arbitrary and were selected by consensus. There is evidence that strays travel distances much greater than 30km. Furthermore, the protocol is not being adhered to in Maine, New Brunswick or Newfoundland. As such, the exclusion areas are probably not reasonable. The sub-committee questioned the utility of any exclusion zone but was unable to provide a reasonable alternative that embodied the intent of the protocols in question. It was suggested that tagging studies were necessary to get some idea of the exploitation rates of various rivers. Exclusion zones might be more reasonable if they were applied on individual rivers rather than all rivers within a zone.

5. **Advise on modifications that should be made to the protocols which will reduce the risk of adverse genetic effects on wild salmon stocks; conversely, are there modifications that could be made to the Protocols which would reduce restrictions on the movement of salmonids without increasing the risk of adverse genetic effects on wild salmon stocks?**

One of the major criticisms of the protocols has been the very broad brush that was used to designate the three classification zones and their implicit restrictions on aquaculture development. Within each zone there are undoubtedly areas that simply "don't fit" the intent of the classification system and warrant some type of exemption or altered status. The NASCO protocols do not specifically allow for river by river or area by area reviews.

The sub-committee recognizes that there is a lack of empirical data to be able to predict the genetic consequence on wild stocks of escaped domestic strains. In the absence of such information, restrictions on the importation of foreign or distant stocks is probably the most prudent and conservative measure. Domestic strains developed from local stocks are probably more similar in terms of genetics than domestic strains developed from distant stocks.

The sub-committee feels that molecular genetic technology has advanced to the point where it should be possible to classify river stocks and domestic strains on some scale of genetic similarity. Armed with this information it may then be possible to establish some criteria which would place limits on the genetic distance allowable between a domestic strain and any given wild stock. This would lead to continuum of allowable domestic strains over the species range and also cover the possibility of a discontinuous distribution of salmon genotypes.

Response to Terms of Reference
Genetics Subgroup

1. **Provide an up-date on the status of scientific knowledge on the effects of using non-local strains of salmon and/or genetically modified salmon in marine and freshwater cage-rearing.**

I am aware of little empirically derived genetic data on the interactions between wild and non-local strains of Atlantic salmon. Heggberget et al (1993), who report genetic interactions between wild and cultured Atlantic salmon in Norway, provide one of the few studies documenting changes in gene frequencies as a result of introgression from cultured fish. Other literature is available, however, the material published on the topic is indirect in nature and theoretical (see White 1995). The genetic consequences of these interactions are arduous to predict with certainty because of the difficulty in predicting the amount of gene flow that occurs. All one can do is assess changes in gene frequencies and speculate as to the impacts on wild populations.

I will review some of the potential (theoretical) effects of non-local strains on wild salmon populations as described in the Executive Summary of a Workshop on Genetic Effects of Straying of Non-Native Hatchery Fish into Natural Populations, sponsored by NMFS. The fundamental genetic principals are the same.

In general, larger genetic differences between native and non-local populations will increase the effects of interbreeding, but the dynamics of any particular situation can be complex. If genetic differences between native and non-local populations are large, substantial reductions in productivity may occur in the short term because of outbreeding depression; however, reduced survival of non-local strains and their introgressive hybrids may help to limit the extent of the impact. More modest genetic differences may not result in such large, short-term reductions in productivity, but persistent gene flow would probably cause the replacement of local genes with non-native ones.

A short-term infusion of non-adaptive genes may be offset by selection due to outbreeding depression. Long-term introgression will eventually replace neutral genes in the local population with non-native genes. Genes with small adaptive effects will also be flushed out from a wild population.

The genetic effects of introgressive hybridization are permanent and are likely to change historical genetic states. If introgressive hybridization ceases, wild populations may recover lost fitness over time, but it is unlikely that the original genetic composition of the population will return.

Introgressive hybridization can be beneficial under certain circumstances: (1) The introduction of foreign genes may mask the effects of deleterious recessive alleles in inbred populations. This may apply to populations outside the zone of abundance for the species (e.g. Maine). (2) Initially, introgressive hybridization will generally increase genetic diversity in local populations. However, there is a trade-off between increases

in genetic diversity and loss of adaptive fitness within populations, and the result of continued introgressive hybridization may be a reduction in within and between population diversity.

Definitions: **outbreeding depression** - If genetic divergence is large between wild and non-local populations, the result can be a reduction in fitness known as outbreeding depression. Outbreeding depression can be caused by two factors; loss of local adaptation (may occur in first generation after hybridization) and breakdown of favourable combinations among gene loci (may not surface until later generations).

introgressive hybridization - Hybridization in which genes from one population or species are introduced and incorporated into another.

2. **With consideration to the potential for adverse genetic effects on wild salmon stocks, comment on the following request from the Nova Scotia Fish Farmers Associations.**

"Within Zone II, rainbow trout, brown trout, Arctic char, striped bass, domestic Atlantic salmon, and other species should not be considered non-indigenous salmon until it is proven that potential adverse impacts of these introductions significantly outweigh economic benefits of their use in aquaculture".

Non-indigenous species are non-indigenous species! There is no justification for calling non-indigenous species not non-indigenous! Perhaps these organizations could develop a justification for relaxing some of the sanctions against non-indigenous species. Does data exist to support such an action for either of the species mentioned? The proposal stated above places an inappropriate burden of proof on agencies charged with protecting native populations.

3. **Comment on the appropriateness of the protocol for Zone II which requires that non-indigenous salmon stocks in cage culture be reproductively sterile.**

There is nothing new to report here. There is clearly insufficient research into the use of polyploid Atlantic salmon to mitigate effects of cultured fish. Further, commercial growers in North America strongly resist using polyploid salmon, primarily because it has not been demonstrated that equal or better performance is achieved compared to normal (diploid) fish. However, until data on the effects of introgressive hybridization are available, it seems prudent that some mitigation strategy be instituted whether it involves sterility via induced polyploidy or by requiring commercial growers to use river-specific (native) stocks.

4. **Are the 30km and 20km exclusion areas referenced in the Protocols reasonable?**

No basis for a response here.

5. **Advise on modifications that should be made to the protocols which will reduce the risk of adverse genetic effects on wild salmon stocks; conversely, are there**

modifications that could be made to the protocols which would reduce restrictions on the movement of salmonids without increasing the risk of adverse genetic effects on wild salmon stocks?

The use of representative river-specific (or local) broodstock seems to be the only mechanism to reducing the risk of adverse genetic effects to native Atlantic salmon populations.

TERMS OF REFERENCE

GENETICS SUBGROUP

1. Provide an up-date on the status of scientific knowledge on the effects of using non-local strains of salmon and/or genetically modified salmon in marine and freshwater cage-rearing.

2. With consideration to the potential for adverse genetic effects on wild salmon stocks, comment on the following request from the Nova Scotia Fish Farmers Associations.

   "Within Zone II, rainbow trout, brown trout, Arctic charr, striped bass, domestic Atlantic salmon, and other species should not be considered non-indigenous until it is proven that potential adverse impacts of these introductions significantly outweigh economic benefits of their use in aquaculture".

3. Comment on the appropriateness of the protocol for Zone II which requires that non-indigenous salmon stocks in cage culture be reproductively sterile (several requests have been made to change this protocol).

4. Are the 30km and 20km exclusion areas referenced in the Protocols reasonable?

5. Advise on modifications that should be made to the protocols which will reduce the risk of adverse genetic effects on wild salmon stocks; conversely, are there modifications that could be made to the protocols which would reduce restrictions on the movement of salmonids without increasing the risk of adverse genetic effects on wild salmon stocks.

GENETICS SUBGROUP

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ATTACHMENT III

SUBJECT: Fish Health Subgroup (USA): Report on Terms of Reference

Term of Reference 1

Considering current nature, development, and application of provincial, state and regional guidelines, one does question the appropriateness, role, and practical implementation of the NAC fish health guidelines, at this time. The NASCO guidelines could enhance consistency and standardization among the various fish health documents, but some of the local policies are in a current state of revision. For example, the New England Salmonid Health Guidelines have been revised, but have not yet been approved by the New England Atlantic Salmon Committee. There remain controversial points of contention within these regulations. Therefore, the NAC should proceed cautiously with any suggested protocols.

Specific non-contentious items for consideration

Some clarification is needed in Part II to avoid certain statements that appear contradictory. On page 23, under 5.1.1; the statements are made "Fish culture facilities including movements to cage culture facilities", "salmonids may be introduced/transferred between fish culture facilities in areas not enzootic for IHN or released into the watersheds if the following provisions are met:..."; on page 23, under 5.1.2, Movements from cage culture facilities, "eyed salmonid eggs may only be introduced/transferred to fish culture facilities from broodstock reared in cage culture facilities ...", and on page 24, under 5.1.3, Free-ranging fish, "introductions/transfers of free-ranging fish in areas not enzootic for IHN into fish culture facilities or released into watersheds must meet the following provisions:" At face value it appears that any transfers are possible, when, in fact, they are restricted by two sections of the protocols for Zone I and Zone II, described in Part I: (1) "No Atlantic salmon reared in a fish culture facility are to be released in a Class I river ..." (see page 7 of Amendments to the Protocols for the Introduction and Transfer of Salmonids, 1994, section 3.2.1 General Within Zone I) and (2) "Reproductively viable non-indigenous species, other than Arctic charr and brook trout, and reproductively viable Atlantic salmon stocks, non-indigenous to the NAC area, are not to be introduced into watersheds or into the marine environment of Zone II" (see page 9 of Amendments to the Protocols for the Introduction and Transfer of Salmonids, 1994, section 3.3.1 General within Zone II).

To prevent any misunderstanding, a revision is suggested that consists of adding the following sentence on page 22 under the major heading "5 TRAFFIC IN FISH": Protocols for the transfer of fish or eyed salmonids eggs described in this section are to be applied under the restrictions for Zones I, II and III that are listed in Part I Section 3 PROTOCOLS.

On page 27, under 7 FISH HEALTH INSPECTIONS, the following statement appears: "(ii) Competence of fish health inspectors shall be based upon the standards set forth by the Fish Health Section of the American Fisheries Society or Canadian Fish Health Protection Regulations." This is an ambiguous statement. The intent appears to state that only inspections from "certified" fish health inspectors shall be accepted. However, it does not state as much nor does it state what standards set forth by the Fish Health Inspection are acceptable. The paragraph should either reflect that "only individuals certified as fish health inspectors by the Fish Health Section of the American Fisheries Society or Canadian Fish

Health Protection Regulations." In lieu of such an absolute statement, the minimum standards for competence should be cited in the text.

On Page 35, under ANNEX IV, METHODS OF DIAGNOSIS. A. The "Procedures for the Detection and Identification of Certain Fish Pathogens", "developed by the Fish Health Section (FHS) of the American Fisheries Society or ..." It should be noted herein that the current revision of this reference has several serious mistakes in the biochemical procedures used to identify fish pathogens. This was inadvertent and must be corrected. One of these mistakes involves *Yersinia ruckeri,* a listed pathogen of concern for the NAC guidelines. Also the differentiation of *Vibrio spp* and *Pastuerella piscicida* (potential pathogens of Atlantic salmon) were not included in revised flow charts. The Fish Health Section was made aware of these problems and a revision is in process.

On page 49, under QUARANTINE FACILITIES. 4; the last sentence states that, "The chlorinated effluent must be neutralized before discharge into surface waters." Considering the increased monitoring of discharges and effluents by environmental organizations since the time that these protocols were originally written, it may be better to state that "all discharges must be in compliance with federal, state, and/or provincial regulations."

Term of Reference 2

Both Terms of Reference 2 and 3 are interrelated and changing the protocol to allow movement of fish across the continental divide (item 3) would also weaken arguments against movement of fish between watersheds of like disease status (item 2). Current protocols were established in the absence of complete information and were designed to err on the side of caution. Policy can assist (1) prevention of new introductions or (2) minimize the deleterious effects of further introductions within an endemic area.

Specifically in regards to Term of Reference 2, the literature documents well the risks that are taken when carrier fish are stocked into watersheds containing other hosts. A case against easing the prohibition on like introductions among watersheds could be made by reviewing the literature related to *furunculosis*. Investigators who studied original outbreaks of *furunculosis* noted that epizootics in natural waters categorically correlated with stocking of fish from infected farms (Mackie et al. 1930, 1933, and 1935). These authors further noted that disease was initially restricted to the stocking area but radiated from that point with time. Plehn (1911) was among the first to transmit *furunculosis* from carrier brook trout to sea char via cohabitation. Later, Horne (1928) noted that apparently healthy carriers can become reservoirs for further infection and emphasized that bacterial exams should be conducted before the fish are stocked in order to curtail further contagion. Hence, it became a matter of practice to avoid stocking infected fish. Two more recent studies, however, have since concluded that stocking infected fish does not affect feral populations (McDermott and Berst 1968, Andrews 1981). Thus, even with furunculosis, there is no definitive answer and the situation may vary depending upon the particulars of the host, pathogen, and environment involved. Still, an obligate pathogen, like *A salmonicida*, shows limited survival as a free-living organism within the aquatic environment (McCarthy 1977). In fact, survival in sea water is limited even when such water is enriched with organics produced at commercial salmon cages (Rose et al 1990). The latter authors thus concluded that shedding of the pathogen from infected fish, not survival in nature, is most important in the process of contagion. Jarp et al (1993) speculate that either bacterial....

Stocking and/or escapement of infected fish could adversely effect feral populations. Even if a pathogen already exists within an environment, Michel and Faivre (1991) used antibiotic resistance markers to differentiate between strains of *A salmonicida.* Under controlled conditions, these researchers indicated that infection of trout with secondary *A salmonicida* strains may stress natural carrier fish and allow the primary, latent strain to become pathogenic. Their results suggest that introduction of a pathogen into an area where fish already harbour such infection can provoke further epizootics.

In concluding, Jarp et al (1993) assessed factors associated with infections caused by *A salmonicida* and concluded, as did McCarthy (1977), that the major risks for confined populations in fresh water involve the migration of infected salmonids into the water supply and the density of infected fish-farming facilities within a particular area. Such concern has influenced much research on reliable detection of the carrier state. The most conclusive way to currently detect carrier fish is labour intensive and requires a combination of corticosteroid injection accompanied by subsequent thermal stress (Bullock and Stuckey 1975, McCarthy 1977). Such examinations are imperative under certain European Fish Health regulations and such tests are used to classify facilities, not individual production lots (Smith 1991).

Term of Reference 3

It is important to maintain such restrictions and even consider inclusion of VHS and OMV diseases as well. Strong pressure exists from the commercial industry to relieve such prohibitions. If restrictions are modified, stringent protocols must be developed to prevent introduction of these viruses. Consideration in the development of such a protocol must involve (1) a virus-free history from the facility or watershed for an "extended" period of time, (2) complete, accurate and extremely sensitive inspections for virus in broodstock and their reproductive products at the point of origin, (3) iodophor disinfection and water hardening of eggs at point of shipment and point of receipt, (4) incubation of eggs in virus-free water. In addition to erring conservatively with respect to the likelihood of disease epizootics, there are also genetic and ecological arguments (NAC Protocols, Parts III and IV) against the movement of fish between watersheds and across boundaries. We believe the position remains strong for maintaining a prohibition in the movement of fish across the Continental Divide.

Term of Reference 4

Speaking candidly, the review of NAC fish health protocols may be better delayed until such time as regional issues have been clarified. To revise the NAC guidelines in advance of the New England revision is inadvisable. During the interim, however, NAC should continue to encourage state and provincial compacts to further refine their regional fish health protocols and policies. Additionally, the Committee strongly suggests that NASCO identify and prioritize research needs that will assist in development of improved protocols and policies thereby providing sound information that would decrease the risk of adverse fish health effects on wild stocks of salmon. This factor should probably be considered as an additional point of reference to the fish health committee in further correspondence.

Fish Health Subgroup (Canada part)
Report on Terms of Reference of December 1995

1. Provide a review of the fish health section (Part I and II) of the NAC Protocols...

We feel that given the progress that the individual jurisdictions (federal, state, provincial, GLFDC, NESHG's, etc) have made in developing/modifying their own fish health protocols/policies/regulations, there is no longer any need for a specific set of NASCO protocols. Many differing (and sometimes conflicting) set of protocols/policies/regulations leads to confusion, unequal treatment of proponents and even the 'playing off' of one set of rules against another. We feel that at this stage the individual NASCO member states, provinces and countries are most familiar with the fish health issues of their jurisdictions and that the management of them should rest at those levels. We feel that NASCO has a role in encouraging the individual member jurisdictions to continue to develop and revise their fish health rules in light of the ever-changing fish health picture, to consider their neighbours during the process, and, whenever possible, to strive for a degree of harmony ... keeping in mind at all times the goal of protecting both public and private fish resources (Atlantic salmon - in NASCO's case). We believe that this is already the direction that things are going.

2. Advise on the appropriateness of permitting fish movements between watersheds (or facilities) of like disease status irrespective of the provincial (State) and federal borders

We feel that this is an issue best dealt with by the individual jurisdictions concerned.

A desire to be able to move fishes between facilities/drainage basins with 'like' disease profiles was highlighted during the cross-country consultations that took place in Canada before the federal government re-opened the Canadian Fish Health Protection Regulations (FHPR) for review and revision; the present FHPR would prohibit such movements The 'FHPR Review Technical Committee (Finfish)' - a committee made up of federal, provincial and private industry representatives - continues to try to incorporate this concept into a 'revised' FHPR. Additionally, fish health people in the three Maritime Provinces (Nova Scotia, New Brunswick and Prince Edward Island) have had preliminary discussions on what provincial concerns would have to be addressed if such a change were to be made in the FHPR.

Other 'like-to-like' issues already being considered include:-

- concerns about how one could be sure that the organisms being moved were actually the same; what degree of 'likeness' will be acceptable (issues of strain, serotype and even antibiotic sensitivities are being discussed) and;
- what other federal and/or provincial regulations would have to come into play to control movements within a province since the FHPR only apply to movements across the provincial boundary and;
- costs of determining the health status of drainage basins will be considerable and would have to be assumed by the regulating authority.

3. **Is it necessary to maintain the protocol that prohibits the introduction or transfer of fish from west of the continental divide, or other IHN infected areas?**

If we no longer have a NASCO fish health protocol this also becomes an issue for the individual jurisdictions (e.g. look at the Maine fish health guidelines). However, opinions on this issue varied from 'yes' since it would be impossible to 100% guarantee that the virus was NOT in the fish to be transferred to a concern about the real practicality in designating water bodies or facilities as disease-free.

As regards the application of the existing prohibition I believe that it has been variously interpreted and applied. In Part I, Summary, 3.1 (2) it states: "No live salmonid fishes, fertilized eggs, gametes, or fish products are to be imported from IHN enzootic areas, *unless sources have an acceptable history of disease testing demonstrating the absence of IHN...*" (my italics). Yet in the more detailed protocols, Part II, 5.2 (i) it states, "No live salmonid fish gametes, fertilized eggs, or fish products may be imported from the areas enzootic for Infectious Haematopoietic Necrosis Virus (Currently Washington, Oregon, Idaho, California, Alaska, British Columbia, all of Japan, and parts of Taiwan and France) and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas enzootic for IHN virus" and (ii) states, "Facilities which have received live salmonid fish, gametes, fertilized eggs, or fish products from IHN enzootic areas can transfer fertilized eyed eggs (only) if the following conditions are met:" (there follows a set of 9 conditions). As I recall, the intent of (ii) was to permit the transfer of eyed eggs from some source that was not in an IHN enzootic area - e.g. east of the continental divide - but still outside the NASCO, NAC, zones.

A review of the NASCO inventory reveals that salmonid eggs/fish have moved from IHN enzootic areas (e.g. Washington) into NAC zones (Quebec, Prince Edward Island, and Nova Scotia - Nova Scotia in 1995) under FHPR without any evidence of IHN being transferred. These FHPR transfers (there are 5 FHPR 'certified' facilities in Washington and Idaho - Aug '95 listing from National Registry of Fish Diseases) have been deemed to be in keeping with the intent of the NAC protocols and are in line with the Part I, Summary text of 3.1,(2). We feel that it is appropriate at this stage to let the individual jurisdictions' protocols/policies/regulations address the issue.

4. **Advise on modification that should be made to the protocols .....**

Once again, if we accept that specific NASCO fish health protocols are no longer warranted, this becomes a non-issue..... if we maintain the protocols we see a need for revision in such areas as the lists of diseases, the IHN enzootic areas prohibition clauses, the inspection report and the BKD FAT use/interpretation (at least).

Terms of Reference

Fish Health Subgroup

1. Provide a review of the fish health section (Part I and II) of the NAC protocols. Take into account the current reviews which are being undertaken of the Canadian Fish Health Protection Regulations, the New England Salmonid Health Guidelines, the proposed New Fish Health Guidelines for Maine, and the amendments to the US Title 50, and the latest version of the Fish Health Policy of the US Fish and Wildlife Service. Also see, GLFC Special Publication 93-1 (Edited by R W Horner and R L Eshenroder) which outlines a Protocol to Minimize the Risk of Introducing Emergency Disease Agents with Importation of Salmonid Fishes from Enzootic Areas.

2. Advise on the appropriateness of permitting fish movements between watersheds (or facilities) of like disease status irrespective of the provincial (State) and federal border. (Request by the Nova Scotia Fish Farmers).

3. Is it necessary to maintain the protocol that prohibits the introduction or transfer of fish from west of the continental divide, or other IHN infected areas? Advise on a Protocol(s) for designating a facility or water-body (in an IHN infected geographical area) as disease-free, from which fish can be transferred or introduced to the NAC Area.

4. Advise on modifications that should be made to the protocols which will reduce the risk of adverse fish health effects on wild salmon stocks; conversely, are there modifications that could be made to the protocols which would reduce restrictions on the movement of salmonids without increasing the risk of adverse fish health effects on wild salmon stocks?

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SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS IN EASTERN NORTH AMERICA 1986-1995

PREPARED FOR THE:
NORTH AMERICAN COMMISSION (NASCO) SCIENTIFIC WORKING GROUP
ON INTRODUCTIONS AND TRANSFERS OF SALMONIDS
May 22, 1996

ABBREVIATIONS USED IN TABLES

COUNTRIES/PROVINCES/STATES

AK	ALASKA
AUS	AUSTRALIA
BC	BRITISH COLUMBIA
CAN	CANADA
CA	CALIFORNIA
CO	COLORADO
CT	CONNECTICUT
FIN	FINLAND
ICE	ICELAND
ID	IDAHO
IN	INDIANA
LAB	LABRADOR
ME	MAINE
MAN	MANITOBA
MA	MASSACHUSETTS
MI	MICHIGAN
MT	MONTANA
NB	NEW BRUNSWICK
NFLD	NEWFOUNDLAND
NH	NEW HAMPSHIRE
NJ	NEW JERSEY
NOR	NORWAY
NY	NEW YORK
NS	NOVA SCOTIA
ONT	ONTARIO
OR	OREGON
PA	PENNSYLVANIA
PEI	PRINCE EDWARD ISLAND
QUE	QUEBEC
RI	RHODE ISLAND
SASK	SASKATCHEWAN
SCO	SCOTLAND
SWE	SWEDEN
TN	TENNESSEE
US	UNITED STATES OF AMERICA
UT	UTAH
VT	VERMONT
WA	WASHINGTON
WV	WEST VIRGINIA
WY	WYOMING
YUK	YUKON

OTHER TERMS

AF	ATYPICAL FURUNCOLOSIS
ANAD	ANADROMOUS
ANT	ANTIFREEZE
ATL	ATLANTIC
AQC	AQUACULTURE
BOF	BAY OF FUNDY
BK	BROOK
BKD	BACTERIAL KIDNEY DISEASE
CK	CREEK
CM	CENTIMETRE(S)
CNTR	CENTRE
DOM	DOMESTIC
E EGGS	EYED EGGS
ENV	ENVIRONMENT
EXP	EXPERIMENTAL/RESEARCH
FCS	FISH CULTURE STATION
FING	FINGERLING(S)
FLDR	FLOUNDER
FF	FISH FARM
G	GRAM
G EGGS	GREEN EGGS
H	HATCHERY
HARB	HARBOUR
IPN	INFECTIOUS PANCREATIC NECROSIS
IS	ISLAND
JUV	JUVENILE
LAB	LABORATORY
LK	LAKE
LL	LANDLOCKED
MA	MOTILE AEROMONAS
MO	MONTH
NW	NORTHWEST
P	PROPOSED
PS	PUBLIC STOCKING
P SMT	POST SMOLT
P/S	PARR/SMOLT TRANSITION
PYP	POST-YEARLING PARR
QUAR	QUARANTINE (FACILITY)
R	RIVER
RET	RETURN(ING)
SJR	SAINT JOHN RIVER
SKAM	SKAMANIA
S	SPRING(S)
SS	STEELHEAD STRAIN
STR	STRAIN
S/FRY	SAC FRY
S YEAR	SPRING YEARLING
TF	TROUT FARM
TR	TRIPLOID
TRG	TRANSGENIC
U	UNIVERSITY
UNID	UNIDENTIFIED
UNK	UNKNOWN
UY PARR	UNDER-YEARLING PARR
W	WILD
WNTR	WINTER
WS	WATERSHED
YEAR	YEARLING
*	REVISION

ORGANIZATIONS

ASF	ATLANTIC SALMON FEDERATION
ASI	ATLANTIC SALMON (MAINE) INC
ASL	ATLANTIC SMOLTS LIMITED
ASRSC	ATLANTIC SEA-RUN SALMON COMMISSION
AVC	ATLANTIC VETERINARY COLLEGE
BOFAI	BAY OF FUNDY AQUACULTURE INDUSTRY
CDEP	CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEC	DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DFO	DEPARTMENT OF FISHERIES AND OCEANS (CANADA)
EPS	ENVIRONMENTAL PROTECTION SERVICE (CANADA)
FMS	FUNDY MARINE SURVEYORS
GNPDC	GREAT NORTHERN PENINSULA DEVELOPMENT CORPORATION
IAS	INTEGRATED AQUATIC SYSTEMS LIMITED
HML	HUNTSMAN MARINE LABORATORY
MAPA	QUEBEC MINISTERE AGRICULTURE, PECHERIE, ALIMENTATION
MCN	MAINE COAST NORDIC
MDFW	MASSACHUSETTS DIVISION OF MARINE FISHERIES
MDMR	MAINE DEPARTMENT OF MARINE RESOURCES
MINL	MARINE INSTITUTE OF NEWFOUNDLAND AND LABRADOR
MMOP	MERI MER OCEAN PRODUCTS
MPL	MARICULTURE PRODUCTS LIMITED
MPS	MAINE PRIDE SALMON
MSRL	MARINE SCIENCES RESEARCH LABORATORY
NBDNRE	NEW BRUNSWICK DEPARTMENT OF NATURAL RESOURCES AND ENERGY
NBFWB	NEW BRUNSWICK FISH AND WILDLIFE BRANCH
NEFFI	NEW ENGLAND FISHING ENTERPRISES INC
NHFG	NEW HAMPSHIRE FISH AND GAME DEPARTMENT
NMFS	NATIONAL MARINE FISHERY SERVICE
NSDF	NOVA SCOTIA DEPARTMENT OF FISHERIES
NWAFC	NORTHWEST ATLANTIC FISHERIES CENTRE
NYDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ONMR	ONTARIO MINISTRY OF NATURAL RESOURCES
OPI	OCEAN PRODUCTS INCORPORATED
OSL	OCEAN SCIENCES LABORATORY, MEMORIAL UNIVERSITY
RIDFW	RHODE ISLAND DIVISION OF FISH AND WILDLIFE
SMBDA	ST. MARYS BAY DEVELOPMENT ASSOCIATION
USFWS	UNITED STATES FISH AND WILDLIFE SERVICE

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

CONNECTICUT

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]											
7001 MT, INNES HATCHERY (ERWIN)		1987	15000	EGGS	CT, CDEP/BURLINGTON HATCHERY					HOUSATONIC RIVER	
8001 TN, ERWIN HATCHERY (ERWIN)		1988	15000	EGGS	CT, CDEP/BURLINGTON HATCHERY					HOUSATONIC RIVER	
9001 MT, INNES HATCHERY (ERWIN)		1989	15000	EGGS	CT, CDEP/BURLINGTON HATCHERY					HOUSATONIC RIVER	
0001 MT, INNES HATCHERY (ERWIN)		1990	15000	EGGS	CT, CDEP/BURLINGTON HATCHERY		*			NOT YET RELEASED: 17/01/91	
0002 MT, INNES HATCHERY (ERWIN)		P1991	15000	EGGS	CT, CDEP/BURLINGTON HATCHERY						
1001 MT, INNES NFH (ERWIN)		1990	15000	EGGS	CT, BURLINGTON SFH					HOUSATONIC RIVER	
1002 MT, INNES NFH (ERWIN)		1991	15000	EGGS	CT, BURLINGTON SFH					NOT RELEASED YET 11/2/92	
1003 MT, INNES NFH (ERWIN)		1992	15000	EGGS	CT, BURLINGTON SFH					NOT RELEASED YET 11/2/92	
SALMO TRUTTA [BROWN TROUT]											
0003 NY, CATSKILL HATCHERY (SEEFORELLEN)		1990	20000	EGGS	CT, CDEP/BURLINGTON HATCHERY		*			NOT YET RELEASED: 17/01/91	
0004 NY, CATSKILL HATCHERY (SEEFORELLEN)		P1991	35000	EGGS	CT, CDEP/BURLINGTON HATCHERY						
1004 NY, CATSKILL SFH (SEEFORELLEN)		1990	20000	EGGS	CT, BURLINGTON SFH					SAUGATUCK RESERVOIR	
1005 NY, CATSKILL SFH (SEEFORELLEN)		1991	35000	EGGS	CT, BURLINGTON SFH					NOT RELEASED YET 11/2/92	
1006 NY, CATSKILL SFH (SEEFORELLEN)		1992	35000	EGGS	CT, BURLINGTON SFH					NOT RELEASED YET 11/2/92	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

MAINE

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS KETA [CHUM SALMON]										
6001	WA, MINTER CREEK H (MINTER CR/WILD)	1986	500000	EGGS	ME, SEA RUN INC/DEAD RIVER H				CASCO BAY	(SEA RANCHING)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
9003	FIN, OY BALTIC (BALTIC/DONALDSON DOM)	1989	10000	EGGS	ME, PINE TREE TROUT					
9004	FIN, OY BALTIC (BALTIC/DONALDSON DOM)	1989	110000	EGGS	ME, MPL/BINGHAM HATCHERY	1990				(STOCK ACCIDENTALLY KILLED)
0012	ONT, RAINBOW SP H (DOMESTIC/STEVENSON)	1990	5000	EGGS	ME, PINE TREE TROUT/SANFORD					
0013	ONT, RAINBOW SP H (DOMESTIC/STEVENSON)	1990	15000	EGGS	ME, PIERCE ASSOCIATES/WEST BUXTON					
1002	SWE, ALVDALSLAX AB(OSTER/DONALDSON)	1991	240000	EGGS	ME, MPL/BINGHAM HAT	1991	50000	F FING	FRENCHBORO	(CAGE CULTURE)
1002						1992	125000	S YEAR	SWANS IS	(CAGE CULTURE)
1003	SWE, ALVDALSLAX AB(OSTER/DONALDSON)	1991	75000	EGGS	ME, PENOBSCOT SALMON FRANKLIN	1992	60000	1+	PREBLE IS	(CAGE CULTURE)
1004	SWE, ALVDALSLAX AB(OSTER/DONALDSON)	1991	50000	EGGS	ME, SEA RUN HOLDINGS DEAD RIVER H	1992	500	SMOLT 1+	NESC, GOVE PT	(CAGE CULTURE)
1004						1992	15000	1+	GARY SMALL, BIRCH PT	(CAGE CULTURE)
1004						1992	30000	1+	NELLIE B FISH INC, LUBEC	(CAGE CULTURE)
1004						1992	10000	1+	MAINE SALMON, COBSCOOK	(CAGE CULTURE)
1009	ONT, RAINBOW SP H (STEVENSON)	1991	15000	EGGS	ME, PIERCE ASSO W BUXTON	1992	7700	1+	FRIENDSHIP ENT, EASTPORT	(CAGE CULTURE)
1010	ONT, RAINBOW SP H (STEVENSON)	1991	10000	EGGS	ME, PIERCE ASSP W BUXTON	P				
1011	ONT, RAINBOW SP H (STEVENSON)	1991	30000	EGGS	ME, ROMMY HAINES JR FORT FAIRFIELD	P				
1012	ONT, RAINBOW SP H (STEVENSON)	1991	10000	EGGS	ME, ROMMY HAINES JR FORT FAIRFIELD					
2093	ONT, RAINBOW SP H (STEVENSON)	1992	5000	EGGS	ME, PINE TREE TROUT/SANFORD	P				
2094	ONT, RAINBOW SP H (STEVENSON)	1992	35000	EGGS	ME, PIERCE ASSO W BUXTON	P				
2095	SWE, ALVDALSLAX AB(OSTER/DONALDSON)	1992	115000	EGGS	ME, PENOBSCOT SALMON FRANKLIN	1992	17500	F FING	MDMR	(SPORT FISHERY)
2096	ONT, RAINBOW SP H (STEVENSON)	1992	15000	EGGS	ME, ROMMY HAINES JR FORT FAIRFIELD	P				
4075	ONT, RAINBOW SP H (STEVENSON)	1994	25000	E EGGS	ME, BRYANT POND FISHERIES/FAIRFIELD				AQUACULTURE	
5105	ONT, RAINBOW SP H (STEVENSON)	1995	20000	FRY	ME, BRYANT POND FISHERIES/FAIRFIELD				AQUACULTURE	
SALMO SALAR [ATLANTIC SALMON]										
6005	NB, SEA FARMS H (SAINT JOHN RIVER)	1986	25000	SMOLTS	ME, OCEAN PRODUCTS INCORPORATED					
6004	SCO, ALLT MOR H (ARAY RIVER/WILD)	1986	50000	EGGS	ME, SEA RUN INC/DEAD RIVER H	P			EASTPORT CAGES	(AQC)
6003	NB, MACTAQUAC FCS (SAINT JOHN RIVER)	1986	1060000	EGGS	ME, ASRSC/GREEN LAKE HATCHERY	P			AROOSTOOK R	(RESTORATION)
6002	NB, MACTAQUAC FCS ? (SAINT JOHN R)	1986	200	ADULTS	ME, ASRSC				AROOSTOOK R	(RESTORATION)
7002	NB, FLORENCEVILLE H (SJR/MINTO)	1987	40000	UY PARR	ME, SALEN INCORPORATED				UPPER SJR	(ENHANCEMENT)
7004	NB, MACTAQUAC FCS (SAINT JOHN RIVER)	1987	55	GRILSE	ME, ASRSC				AROOSTOOK R	(RESTORATION)
7007	SCO, WESTER ROSS H (DOMESTIC)	1987	500000	EGGS	ME, ASI/OQUOSSOC H (REARING)	1989	25000	SMOLTS	CROSS IS	(AQUACULTURE)
7006	NB, SEA FARMS (AQC BROODSTOCK)	1987	25000	SMOLTS	ME, OCEAN PRODUCTS INCORPORATED				EASTPORT CAGES	(AQC)
7001	FIN, OY BALTIC (DOMESTIC SEA CAGES)	1987	500000	EGGS	ME, OPI/DEBLOIS HATCHERY	1988	27000	SMOLTS	SEE NEXT LINE	
7001					ME, OPI/GARDINER LAKE H	1989	22000	SMOLTS	BROAD COVE	(AQUACULTURE)
7005	NB, SEA FARMS (AQC BROODSTOCK)	1987	18000	SMOLTS	ME, FRANK RIER				LUBEC CAGES	(AQUQCULTURE)
7008	NB, JAIL IS SALMON (FUNDY/SAINT JOHN)	1987	1000000	EGGS	NB, SEA FARMS/OROMOCTO H	1989	30000	SMOLTS	JOHNSON BAY	(AQUACULTURE)
7003	NB, FLORENCEVILLE H (SAINT JOHN R)	1987	150000	FRY	ME, ASRSC				UPPER SJR	(ENHANCEMENT)
8001	ICE, ELDI FISH FARMS (AQC BROODSTOCK)	1988	156000	EGGS	ME, MPL/BINGHAM HATCHERY	P1989			(AQUACULTURE)	
8012	ICE, ELDI FISH FARMS	1988	500000	EGGS	ME, MPL/BINGHAM HATCHERY	1989	3000	SMOLTS	ALLEN IS	(AQUACULTURE)
8012						1989	100000	SMOLTS	SWANS IS	(AQUACULTURE)
8012						1989	80000	SMOLTS	LUBEC	(AQUACULTURE)
8013	ICE, ISNO SEA CAGES (AQC BROODSTOCK)	1988	280000	EGGS	ME, MPL/BINGHAM HATCHERY	1989	20000	SMOLTS	TREAT IS	(AQUACULTURE)
8013						1989	15000	SMOLTS	MATHEWS IS	(AQUACULTURE)
8013						1989	60000	SMOLTS	SWANS IS	(AQUACULTURE)
8013						1989	80000	SMOLTS	LUBEC	(AQUACULTURE)
8014	FIN, OY BALTIC (MOORUM)	1988	1000000	EGGS	ME, MPL/BINGHAM HATCHERY	1989	20000	SMOLTS	TREAT IS	(AQUACULTURE)
8014						1989	100000	SMOLTS	SWANS IS	(AQUACULTURE)
8014						1989	80000	SMOLTS	COOPER IS	(AQUACULTURE)
						1989	30000	SMOLTS	TREAT IS	(AQUACULTURE)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

MAINE

FILE	LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	FINAL DISPOSITION YEAR	NUMBER	STAGE	LOCATION (PURPOSE)
SALMO SALAR (ATLANTIC SALMON) CONTINUED										
8004	SCO,	LANDCATCH (AQC/2 NORWAY STRAINS)	1988	1000000	EGGS	ME, ASI/OQUOSSOC HATCHERY	P1989			(AQUACULTURE)
8004	SCO,	LANDCATCH (AQC/2 NORWAY STRAINS)	1988	1000000	EGGS	ME, ASI/OQUOSSOC HATCHERY	P1989			(AQUACULTURE)
8004	SCO,	LANDCATCH (DOMESTIC)	1988	1500000	EGGS	ME, ASI/OQUOSSOC HATCHERY	1989	20000	SMOLTS	GR WASS IS (AQUACULTURE)
8004							1989	80000	SMOLTS	TREAT IS (AQUACULTURE)
8004							1989	80000	SMOLTS	ROGERS IS (AQUACULTURE)
8004							1989	5000	SMOLTS	MATHEWS IS (AQUACULTURE)
8004							1989	35000	SMOLTS	TREAT IS (AQUACULTURE)
8004							1989	225000	SMOLTS	CROSS IS (AQUACULTURE)
8017	NB,	JAIL IS SALMON (FUNDY/SAINT JOHN)	1988	1600000	EGGS	NB, SEA FARMS/DIG & SPRING H	1988	200000	FRY	(SEE NEXT LINE)
8017						NH, BRISTOL HATCHERY	1989	90000	SMOLTS	CUTLER HARB (AQUACULTURE)
8017							1989	60000	SMOLTS	GR WASS IS (AQUACULTURE)
8015			1988	1500000	EGGS	NB, SEA FARMS/DIG & SPRING H	1988	200000	FRY	(SEE NEXT LINE)
8015						NH, BRISTOL HATCHERY	1989	10000	SMOLTS	GROVE PT (AQUACULTURE)
8016			1988	1000000	EGGS	NB, SEA FARMS/DIGDEQUASH H	1989	100000	SMOLTS	LUBEC (AQUACULTURE)
8016							1989	20000	SMOLTS	ROGERS IS (AQUACULTURE)
8016							1989	20000	SMOLTS	GROVE PT (AQUACULTURE)
8005	NB,	DIGDEQUASH H (AQC/SAINT JOHN)	1988	30000	SMOLTS	NB, J STEVENS/LK UTOPIA H				LUBEC SEA CAGES (AQC)
8006	NB,	DIGDEQUASH H (AQC/SAINT JOHN)	1988	99300	SMOLTS	ME, SEA FARMS				LUBEC SEA CAGES (AQC)
8007	NB,	DIGDEQUASH H (AQC/SAINT JOHN)	1988	350000	UY PAR	ME, SALEN INCORPORATED				UPPER SJR (ENHANCEMENT)
8008	NB,	FLORENCEVILLE H (SJR/MINTO & ASF)	1988	20000	UY PAR	ME, SALEN INCORPORATED				UPPER SJR (ENHANCEMENT)
8009	NB,	FLORENCEVILLE H (SJR & MINTO)	1988	27000	FRY	ME, SALEN INCORPORATED				UPPER SJR (ENHANCEMENT)
8010	NB,	MACTAQUAC FCS (SAINT JOHN RIVER)	1988	100	ADULTS	ME, ASRSC				AROOSTOOK R (RESTORATION)
8011	NB,	MACTAQUAC FCS (SAINT JOHN RIVER)	1988	100000	EGGS	ME, ASRSC/GREEN LK H (HATCHING)	1988		FRY	AROOSTOOK R (RESTORATION)
9001	NB,	FLORENCEVILLE H (DOMESTIC/SJR)	1989	30000	PARR	ME, SALEN INCORPORATED				SJR (ENHANCEMENT)
9002	NB,	FLORENCEVILLE H (DOMESTIC/SJR)	1989	80000	FRY	ME, SALEN INCORPORATED				SJR (ENHANCEMENT)
9005	NB,	SAINT JOHN FCS (SAINT JOHN)	1989	10000	SMOLTS	ME, DFO				AROOSTOOK R (SURVIVAL TEST)
9007	NB,	SEA FARMS CANADA (ATLANTIC/SJR)	1989	627000	EGGS	ME, OPI/GARDNER LAKE				(NOT SPECIFIED)
9008	NB,	GRANGER COVE SALMON (ATL/SJR)	1989	225000	EGGS	ME, OPI/GARDNER LAKE				(NOT SPECIFIED)
9009	NB,	GRANGER COVE SALMON (ATL/SJR)	1989	250000	EGGS	ME, ASI/OQUOSSOC HATCHERY				(NOT SPECIFIED)
9010	NB,	KELLY COVE SALMON (ATLANTIC/SJR)	1989	550000	EGGS	ME, MPL/BINGHAM HATCHERY				(NOT SPECIFIED)
9011	NB,	AQUA VENTURES (ATLANTIC/SJR)	1989	550000	EGGS	ME, MPL/BINGHAM HATCHERY				(NOT SPECIFIED)
9012	NB,	KELLY COVE SALMON (ATLANTIC/SJ)	1989	187500	EGGS	ME, NEFFE, KENNEBEC AQUACULTURE				(NOT SPECIFIED)
9013	NB,	AQUA VENTURES (ATLANTIC/SJR)	1989	187500	EGGS	ME, NEFFE, KENNEBEC AQUACULTURE				(NOT SPECIFIED)
9014	NB,	AQUA VENTURES (ATLANTIC/SJR)	1989	250000	EGGS	ME, NEFFE, KENNEBEC AQUACULTURE				(NOT SPECIFIED)
9015	NB,	KELLY COVE SALMON (ATLANTIC/SJ)	1989	250000	EGGS	ME, NEFFE, KENNEBEC AQUACULTURE				(NOT SPECIFIED)
9016	NB,	AQUA VENTURES (ATLANTIC/SJR)	1989	125000	EGGS	ME, ASI/OQUOSSOC HATCHERY				(NOT SPECIFIED)
9017	NB,	KELLY COVE SALMON (ATLANTIC/SJ)	1989	125000	EGGS	ME, ASI/OQUOSSOC HATCHERY				(NOT SPECIFIED)
9018	NB,	CONNORS BROS (ATLANTIC/SJ)	*1989	200000	EGGS	ME, PICARD FARMS/FRENCHVILLE	1991	80000	SMOLT	PRINCE COVE (CAGE CULTURE)
0001	NB,	SAINT JOHN FCS (SJR WILD)	1990	40000	FRY	ME, ASRSC (PUBLIC STOCKING)				WASHBURN, AROOSTOOK RIVER
0002	NB,	SAINT JOHN FCS (SJR WILD)	1990	7569	SMOLTS	NB, DFO (PUBLIC STOCKING/RESEARCH)				PRESQUE ISLE, AROOSTOOK R
0003	NB,	SAINT JOHN FCS (SJR WILD)	1990	6164	SMOLTS	NB, DFO (PUBLIC STOCKING/RESEARCH)				VAN BRUEN, SAINT JOHN RIVER
0004	SCO,	LANDCATCH (AQUACULTURE/DOMESTIC)	*1990	1216804	EGGS	ME, ASI/OQUOSSOC HATCHERY	1991	100000	SMOLT	EASTPORT (CAGE CULTURE)
0004							1991	750000	SMOLT	CROSS ISLAND (CAGE CULTURE)
0005	NB,	AQUA VENTURES (ATLANTIC/SJR)	1990	299830	EGGS	ME, KENNEBEC AQUACULTURE/EMBDEN				
0006	NB,	KELLY COVE SALMON (ATLANTIC/SJR)	1990	140500	EGGS	ME, PENOBSCOT SALMON COMPANY INC	1990	5000	SMOLT	FRENCHMANS BAY (CAGE CULTURE)
	SEE 0005 & 0006 COMBINED		1990			AQUA VENTURE/KELLY COVE	1990	370000	EGGS	KENNEBEC AQUACULTURE EMBDEN
0006							1990	88000	YEAR	PENOBSCOT(FRANKLIN H)
0006							1991	30000	SMOLT	FRENCHMANS BAY(CAGE CULTURE)
0007	NB,	GRANGER COVE SALMON (ATL/SJR)	1990	178640	EGGS	ME, ASI/OQUOSSOC HATCHERY				
0008	NB,	AQUA VENTURES (ATLANTIC/SJR)	1990	230782	EGGS	ME, ASI/OQUOSSOC HATCHERY				
0009	NB,	KELLY COVE SALMON (ATLANTIC/SJR)	*1990	274890	EGGS	ME, MPL/BINGHAM HATCHERY	1991	164936	SMOLT	SWANS ISLAND (CAGE CULTURE)
1001	NB,	DIGDEQUASH HAT (ATL OCEAN ST JOHN)	U/K	U/K	U/K	U/K	1991	122000	SMOLT	LUBEC (CAGE CULTURE)

FILE	LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	YEAR	NUMBER	STAGE	TRANSFERS SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
SALMO SALAR (ATLANTIC SALMON) CONTINUED												
1005	NB,	GRANGER COVE SALMON (DOMESTIC)	1991	450000	EGGS	ME, RANGLEY HATCHERY		1992	450000	S1	ASI, CROSS IS	(CAGE CULTURE)
1006	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1991	1195789	EGGS	ME, KENNEBEC AQUACULTURE/EMBDEN		1992	35000	FRY	PENOBSCOT(FRANKLIN H)	
1006								1992	48000	FING	PENOBSCOT(FRANKLIN H)	
1006								1992	158000	EGGS	ASI/RANGELY HATCHERY	
1007	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1991	150000	EGGS	ME, PENOBSCOT SALMON FRANKLIN						
1008	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1991	200000	EGGS	ME, ASI/RANGELEY HAT		P				
1013	NB,	SEA FARMS FRYE ISLAND (ATL ST J)	1991	450000	EGGS	ME, ASI/RANGELEY HAT		1992	450000	S1	ASI, CROSS IS	(CAGE CULTURE)
1014	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1991	300000	EGGS	ME, ASI/RANGELEY HATCHERY		P				
1015	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1991	576163	EGGS	ME, KENNEBEC AQUACULTURE/EMBDEN		1992	15000	S1	ASI, CROSS IS	(CAGE CULTURE)
1015								1992	25000	S1	TREATS IS	(CAGE CULTURE
1015								1992	15000	S1	ASI, CROSS ISLAND	(CAGE CULTURE)
1015								1992	80000	S1	MCN, CUTLER HARB	(CAGE CULTURE)
1016	NB,	GRANGER COVE SALMON (ATL ST JOHN)	1991	170000	EGGS	ME, PENOBSCOT SALMON FRANKLIN		1992	150000	SMOLT	PREBLE IS	(CAGE CULTURE)
1017	NB,	GRANGER COVE SALMON (ATL ST JOHN)	1991	300000	EGGS	ME, PICARD HATCHERY FRENCHVILLE		1992	15000	S1	MPS, PRINCE COVE	(CAGE CULTURE)
1017								1992	85000	SMOLT	MPS, COOPER IS	(GAGE CULTURE)
1017								1992	45000	S1	MPS, COOPER IS	(CAGE CULTURE)
1017								1992	30000	SMOLT	MPS, PRINCE COVE	(CAGE CULTURE)
1018	NB,	GRANGER COVE SALMON (ATL ST JOHN)	1991	315000	EGGS	ME, ASI/RANGELEY HATCHERY		1992	315000	S1	ASI, CROSS ISLAND	(CAGE CULTURE)
1019	NB,	KELLY COVE SALMON (ATL ST JOHN)	1991	420000	EGGS	ME, MARICULTURE PRO BINGHAM H						
2088	NB,	AQUA VENTURES (ATLANTIC ST JOHN)	1992	175000	EGGS	ME, PENOBSCOT SALMON FRANKLIN						
2089	NB,	GRANGER COVE SALMON (ATL ST JOHN)	1992	792000	EGGS	ME, ASI/RANGELEY HATCHERY						
2090	AUS,	PURVES FISHERIES (RIVER PHILIP,NS)	1992	750000	EGGS	ME, MAINE PRIDE SALMON/PICARD H						
2091	NB,	SEA FARMS DIGDEGUASH (ATL ST JOHN)	1992	40000	S1	ME, TREATS ISLAND FISHERIES		1992	40000	S1	TREATS ISLAND	(CAGE CULTURE)
2091				25000	S2	ME, TREATS ISLAND FISHERIES		1992	25000	S2	TREATS ISLAND	(CAGE CULTURE)
2092	NB,	SEA FARMS DIGDEGUASH (ATL ST JOHN)	1992	110000	S1	ME, SEA FARM MAINE INC		1992	110000	S1	JOHNSON BAY	(CAGE CULTURE)
2092				50000	S2	ME, SEA FARM MAINE INC		1992	50000	S2	JOHNSON BAY	(CAGE CULTURE)
4076	NB,	AQUA VENTURES (ATLANTIC SAINT JOHN)	1994	1000000	E EGGS	ME, SOLON/KENNEBEC AQUACULTURE					AQUACULTURE	
4077	NB,	AQUA VENTURES (ATLANTIC SAINT JOHN)	1994	2000000	G EGGS	ME, SOLON/KENNEBEC AQUACULTURE					AQUACULTURE	
4078	NB,	HARBOUR DELOUTRE PRODUCTS (ST JOHN)	1994	1000000	G EGGS	ME, ATLANTIC AQUAFARMS/FRANKLIN					AQUACULTURE	
4079	NB,	HARBOUR DELOUTRE PRODUCTS (ST JOHN)	1994	200000	E EGGS	ME, PENOBSCOT SALMON/FRANKLIN					AQUACULTURE	
4080	NB,	AQUA VENTURES (SAINT JOHN)	1994	600000	E EGGS	ME, ATLANTIC SALMON MAINE INC/OQUOSSOC					AQUACULTURE	
4081	NB,	AQUA VENTURES (SAINT JOHN)	1994	500000	E EGGS	ME, CONNORS BROTHERS/DEBLOIS HATCHERY/CHERRYFIELD					AQUACULTURE	
4082	NB,	HARBOUR DELOUTRE PRODUCTS (ST JOHN)	1994	750000	E EGGS	ME, SOLON/KENNEBEC AQUACULTURE					AQUACULTURE	
4083	NB,	AQUA VENTURES (SAINT JOHN)	1994	750000	E EGGS	ME, SOLON/KENNEBEC AQUACULTURE					AQUACULTURE	
4084	NB,	WILSON'S BEACH CAMPOBELLO (ST JOHN)	1994	200000	E EGGS	ME, PENOBSCOT SALMON/FRANKLIN					AQUACULTURE	
4085	NB,	KELLY COVE SALMON LTD (SAINT JOHN)	1994	350000	E EGGS	ME, ATLANTIC AQUAFARMS INC/FRANKLIN					AQUACULTURE	
4086	NB,	STOLT SEA FARMS/DIGDEGUASH (ST JOHN)	1995	72500	SMOLT	ME, TREATS ISLAND FISHERIES/EASTPORT					AQUACULTURE	
4087	NB,	STOLT SEA FARMS/DIGDEGUASH (ST JOHN)	1995	128000	SMOLT	ME, MR. DINSMORE/JOHNSON BAY LUBEC					AQUACULTURE	
4088	NB,	STOLT SEA FARMS/DIGDEGUASH (ST JOHN)	1995	12000	SMOLT	ME, MR. DINSMORE/JOHNSON BAY LUBEC					AQUACULTURE	
5106	NB,	KELLY COVE SALMON LTD (SAINT JOHN)	1995	250	ADULT	ME, NORTHEAST LABORATORY/WATERVILLE					FISH HEALTH INSPECTION	
5107	NB,	HARBOUR DELOUTRE PRODUCTS (ST JOHN)	1995	1500000	G EGGS	ME, ATLANTIC AQUAFARMS/FRANKLIN					AQUACULTURE	
5108	NB,	MACTAQUAC FCS (SAINT JOHN/FERAL)	1995	50000	G EGGS	ME, ATLANTIC SALMON NORTHERN MAINE, INC/PRESQUE ISLE					DISTRIBUTION	
SALMO SALAR (LANDLOCKED ATLANTIC SALMON)												
4089	ME,	GRAND LAKE STREAM H (WEST GRAND DOM)	1994	115000	G EGGS	NB, NBDNR/FLOWERS COVE HATCHERY						
SALVELINUS ALPINUS [ARCTIC CHAR]												
9006	NB,	HML (HML/FRASER R, LABRADOR)	1989	20000	EGGS	ME, MPL/BINGHAM HATCHERY	P	1990			(NOT SPECIFIED)	
6001	QUE,	PISCICULTURE ST-DAMIEN (ROCKWOOD)	1996	150000	FRY	ME, ATLANTIC AQUAFARMS/FRANKLIN		1996			(AQUACULTURE)	
SALVELINUS FONTINALIS [BROOK TROUT]												
0010	CO,	4 SEASONS TF (WILDCAT RESERVOIR)	1990	20000	EGGS	ME, PIERCE ASSOCIATES/WEST BUXTON						
0011	UT,	EGAN HATCHERY (EGAN H/OWHI)	1990	145327	EGGS	ME, MDIFW/COBB STATE HATCHERY		1990	112019	FING	VARIOUS	(PUBLIC STOCKING)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

MASSACHUSETTS

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
ONCORHYNCHUS KISUTCH [COHO SALMON]									
6003 OR,	ORE AQUA INC (UNKNOWN)	1986	25000	EGGS	MA, SP INC/SALEM LABORATORY				SALEM LAB TANKS (AQC)
6001 MA,	SULLIVAN & SANDWICH H (NORTH R/WA)					1986	24942	SMOLT	NORTH RIVER (RESEARCH)
7001 OR,	ORE AQUA INC (UNKNOWN)	1987	35000	EGGS	MA, R T CAPELESS				HINSDALE TANKS (AQU)
8002 MI,	PLATTE RIVER HATCHERY				MA, SULLIVAN HATCHERY	1988	30000	JUV	NORTH RIVER (RESEARCH)
8001 MA,	(NORTH RIVER)				MA, SULLIVAN HATCHERY	1988	21000	JUV	NORTH RIVER (RESEARCH)
9001 MI,	PLATTE RIVER HATCHERY	*			MA, SULLIVAN HATCHERY	1989	50000		NORTH RIVER (RESEARCH)
9002 NY,	SALMON RIVER HATCHERY	*			MA, SULLIVAN HATCHERY	1989	50000		NORTH RIVER (RESEARCH)
1004 NY,	AQUA ARBOR(Hinchinbrooke)	1991	10000	EGGS	MA, MDFW/BANCROFT MILL FARM				RESEARCH/FOOD PRO
8029 MI, NY		1988	193968	EGGS	MA,	1988			SEE BELOW
8029 MI,					MA,	1988	10023		STOCKED
8029 MI, NY					MA,	1988	4321		STOCKED
8029 MI,					MA,	1989	41977		STOCKED
8029 NY,					MA,	1989	44897		STOCKED
9018 NH,	MILFORD HATCHERY	1989	8000	EGGS	MA,	1989	8000		STOCKED
9019 NY,	SALMON RIVER HATCHERY	1989	63480	EGGS	MA,	1989	63480		STOCKED
ONCORHYNCHUS MYKISS [RAINBOW TROUT]									
6004 WA,	TROUT LODGE (UNKNOWN)	1986	50000	EGGS	MA, MOHAWK TROUT HATCHERY				SUTHERLAND PONDS (AQC)
9005 WA,	TROUT LODGE (DOMESTIC)	1989	550000	EGGS	MA, MCLAUGHLIN HATCHERY	1990	100000	FRY	SEE NEXT LINE
9005					SANDWICH HATCHERY	*1991		1+	
(PUBLIC FISHING)									
9005					MA, MCLAUGHLIN HATCHERY	1990	75000	FRY	SEE NEXT LINE
9005					SUNDERLAND HATCHERY	*1991		1+	(PUBLIC FISHING)
9005					MA, MCLAUGHLIN HATCHERY	1990	75000	FRY	SEE NEXT LINE
9006 ID,	BLACK CANYON TF (DOMESTIC)	1989	30000	EGGS	MONTAGUE HATCHERY	*1991		1+	(PUBLIC FISHING)
0001 ONT,	AQUAFARMS CANADA (DOMESTIC)	1990	20000	EGGS	MA, MCLAUGHLIN HATCHERY	*1991		1+	(PUBLIC FISHING)
0002 UT,	TROPHY FISH RANCH INC (DOMESTIC)	1990	500000	G EGGS	MA, D J ADAMS HATCHERY				(PRIVATE AQUACULTURE)
0002					MA, MDFW/MCLAUGHLIN HATCHERY	1991	80000	FRY	SEE NEXT 2 LINES
0002					SUNDERLAND HATCHERY	*1991		VARIOUS	(PUBLIC FISHING)
0002					SUNDERLAND HATCHERY	*1992		VARIOUS	(PUBLIC FISHING)
0002					MA, MDFW/MCLAUGHLIN HATCHERY	1991	80000	FRY	SEE NEXT 2 LINES
0002					MONTAGUE HATCHERY	*1991		VARIOUS	(PUBLIC FISHING)
0003 UT,	TROPHY FISH RANCH INC (DOMESTIC)	1990	100000	G EGGS	MONTAGUE HATCHERY	*1992		VARIOUS	(PUBLIC FISHING)
0003					MA, MDFW/SANDWICH HATCHERY	*1991		VARIOUS	(PUBLIC FISHING)
0004 ONT,	AQUAFARMS CANADA (DOMESTIC)	1990	700	FING	MA, MDFW/SANDWICH HATCHERY	*1992		VARIOUS	(PUBLIC FISHING)
0005 ONT,	RAINBOW SPRINGS H (DOMESTIC)	1990	60000	E EGGS	MA, MDFW/PLYMOUTH ROCK TROUT CO.			UNKNOWN	
0006 ONT,	WILDCAT TROUT FARM (DOMESTIC)	1990	100000	E EGGS	MA, MDFW/PLYMOUTH ROCK TROUT CO.			UNKNOWN	
1001 UT,	TROPHY FISH RANCH INC(DOMESTIC)	1991	600000	FRY	MA, MDFW/PLYMOUTH ROCK TROUT CO.			UNKNOWN	
1001		1992	100000	FRY	MA, MDFW/McLAUGHLIN HATCHERY	*1992	270000	FRY	SEE NEXT 3 LINES
1001		1992	80000	FRY	SANDWICH STATE HATCHERY	P1993			(PUBLIC FISHING)
1001		1992	90000	FRY	SUNDERLAND STATE HATCH	P1993			(PUBLIC FISHING)
1005 MT,	SPRING CREEK HAT(DOMESTIC)	1991	10000	FRY	MONTAGUE STATE HATCH	P1993			(PUBLIC FISHING)
2097 UT,	TROPHY FISH RANCH INC(DOMESTIC)	1992	650000	EGGS	MA, MDFW/GAUTHIER TROUT FARM				PRIVATE SECTOR DOMAIN
2097		1993	100000	FRY	MA, MDFW/McLAUGHLIN HATCHERY	1993	270000	FRY	SEE NEXT 3 LINES
2097		1993	80000	FRY	SANDWICH HATCHERY	P1994			(PUBLIC FISHING)
2097		1993	90000	FRY	SUNDERLAND STATE HATCHERY	P1994			(PUBLIC FISHING)
3001 TN,	ERWIN HATCHERY (DOMESTIC)	1993	177000	EGGS	MONTAGUE STATE HATCHERY	P1994			(PUBLIC FISHING)
					MA, MDFW/McLAUGHLIN HATCHERY	P1995		S YEAR	(PUBLIC FISHING)
ONCORHYNCHUS MYKISS KAMLOOPS [KAMLOOPS TROUT]									
6002 WA,	TROUT LODGE (UNKNOWN)	1986	10000	EGGS	MA, CANDEES TROUT HATCHERY				EGERMONT PONDS (AQC)
ONCORHYNCHUS TSHAWYTSCHA [CHINOOK SALMON]									
9017 NY,	SALMON RIVER HATCHERY	1989	153899	EGGS	MA,	1989	76880		STOCKED

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

MASSACHUSETTS

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
SALMO SALAR [ATLANTIC SALMON]									
8003 ME,	(UNION RIVER)				MA, MDFW/REED HATCHERY	1988	6033	FRY	WESTFIELD RIVER
8003						1988	27467	FRY	MANHAN RIVER
8003						1988	14969	FRY	BEAR RIVER
8003						1988	23430	FRY	COLD RIVER
8003						1988	12000	FRY	SOUTH RIVER
8004 ME,	(UNION RIVER)				MA, MDFW/REED HATCHERY	1988	22600	SMOLTS	DEERFIELD RIVER
8004						1988	22800	SMOLTS	MILLERS RIVER
8005 ME,	(UNION RIVER)				MA, MDFW/REED HATCHERY	1988	2700	PARR	MILLERS RIVER
8005						1988	2300	PARR	DEERFIELD RIVER
9003 CT,	(CONNECTICUT RIVER)				MA, MDFW/REED HATCHERY	1989	120000	FRY	DEERFIELD RIVER
9004 CT,	(CONNECTICUT RIVER)				MA, MDFW/REED HATCHERY	1989	20000	SMOLTS	DEERFIELD RIVER
9004						1989	20000	SMOLTS	MILLERS RIVER
SALMO TRUTTA(BROWN TROUT)									
1002 MT,	SPRING CREEK H (DOMESTIC)	1991	100000	EGGS	MA, MDFW/TROUT FARM WAREHAM				PRIVATE SECTOR DOMAIN
2098 MT,	SPRING CREEK H (DOMESTIC)	1992	200000	EGGS	MA, MDFW/McLAUGHLIN H	1993	80000	FRY	SEE NEXT TWO LINES
2098		1993	40000	FRY	SUNDERLAND STATE H	P1994			(PUBLIC FISHING)
2098		1993	40000	FRY	MONTAGUE STATE H	P1994			(PUBLIC FISHING)
3111 MT,	SPRING CREEK H (DOMESTIC)	1993	197000	EGGS	MA, MDFW/McLAUGHLIN H	1994	150000	FRY	SEE NEXT TWO LINES
					SUNDERLAND STATE H	P1995		S YEAR	(PUBLIC FISHING)
					MONTAGUE STATE H	P1995		S YEAR	(PUBLIC FISHING)
SALVELINUS FONTINALIS(BROOK TROUT)									
1003 MT,	SPRING CREEK HAT (DOMESTIC)	1991	100000	EGGS	MA, MDFW/TROUT FARM WAREHAM				PRIVATE SECTOR DOMAIN
1006 NB,	GREENACES TROUT H (PIS ALLEGHANYS)	U/K	50000	EGGS	MA, MDFW/RED WING MEADOW FARM				PRIVATE SECTOR DOMAIN
3112 MT,	SPRING CREEK HAT (DOMESTIC)	1993	270000	EGGS	MA, MDFW/McLAUGHLIN H	1994	50000	FRY	SEE NEXT TWO LINES
					SUNDERLAND STATE H	P1995		S YEAR	(PUBLIC FISHING)
					MONTAGUE STATE H	P1995		S YEAR	(PUBLIC FISHING)
3113 NY,	FERNWOOD TROUT HAT (DOMESTIC)	1993	325000	EGGS	MA, MDFW/McLAUGHLIN H	1994	50000	FRY	SEE NEXT TWO LINES
					SUNDERLAND STATE H	P1995		S YEAR	(PUBLIC FISHING)
					MONTAGUE STATE H	P1995		S YEAR	(PUBLIC FISHING)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 NEW BRUNSWICK

FILE	ORIGINAL SOURCE				TRANSFERS				FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
7007	ONT, RAINBOW SPRINGS HATCHERY	1987	2000	EGGS	NB, ST ANDREWS BIOLOGICAL STATION					
7015	QUE, PISCICULTURE ALLEGHANYS	1987	3000	FING	NB, D WOLVERTON				CENTERVILLE	(AQUACULTURE)
7016	ONT, RAINBOW SPRINGS HATCHERY	1987	4000	FING	NB, A PHILLIPS				MONCTON	(AQUACULTURE)
7010	PEI, INTEGRATED AQUATICS	1987	4000	FING	NB, DON CHAPMAN				CAMPOBELLO	(AQUACULTURE)
7008	WA, BEITEYS RESORT	1987	75000	EGGS	NB, PURTILL HATCHERY				SUSSEX	(AQUACULTURE)
7002	ONT, AQUAFARMS CANADA LTD	1987	15000	FING	NB, FUNDY MARINE SURVEYERS				SAINT JOHN	(AQUACULTURE)
7014	QUE, PISCICULTURE ALLEGHANYS	1987	1300	FING	NB, G CORMIER				GRAND FALLS	(AQUACULTURE)
7013	PEI, INTEGRATED AQUATICS	1987	3600	FING	NB, MERI-MER OCEAN PRODUCTS				WELSHPOOL	(AQUACULTURE)
7012	QUE, PISCICULTURE ALLEGHANYS	1987	6000	FING	NB, ATLANTIS SEA FARMS				CLIFTON ROYAL	(AQUACULTURE)
7011	QUE, PISCICULTURE ALLEGHANYS	1987	200000	EGGS	NB, ATLANTIS SEA FARMS				CLIFTON ROYAL	(AQUACULTURE)
7003	ONT, RAINBOW SPRINGS HATCHERY	1987	50000	EGGS	NB, PURTILL HATCHERY				SUSSEX	(AQUACULTURE)
7017	ONT, AQUAFARMS CANADA LTD	1987	100000	EGGS	NB, ALVIN CRAFT/HATFIELD POINT				HATFIELD PT	(AQUACULTURE)
7005	ONT, RAINBOW SPRINGS HATCHERY	1987	40000	EGGS	NB, OAK BAY HATCHERY				ST STEPHEN	(AQUACULTURE)
7009	PEI, INTEGRATED AQUATICS	1987	3000	FING	NB, LLOYD COOK				ST GEORGE	(AQUACULTURE)
7001	ONT, RAINBOW SPRINGS HATCHERY	1987	177000	EGGS	NB, ATLANTIC SEA FARM				CLIFTON ROYAL	(AQC)
7018	ONT, AQUAFARMS CANADA LTD	1987	20000	EGGS	NB, MEADOW LAKE FARMS				SAINT JOHN	(AQUACULTURE)
7004	ONT, RAINBOW SPRINGS HATCHERY	1987	50000	EGGS	NB, ATLANTIC SMOLTS LTD				MINTO	(AQUACULTURE)
7006	ONT, RAINBOW SPRINGS HATCHERY	1987	20000	EGGS	NB, SISCOR CORPORATION				MONCTON	(AQUACULTURE)
8024	ONT, RAINBOW SPRINGS HATCHERY	1988	10000	FING	NB, WILLIAM KNOW (REARING)				SAINT JOHN	(AQUACULTURE)
8023	QUE, PISCICULTURE ALLEGHANYS	1988	800	FING	NB, GILLES CORMIER (REARING)				GRAND FALLS	(AQUACULTURE)
8022	PEI, INTEGRATED AQUATICS	1988	4300	FING	NB, L COOK, ST GEORGE (REARING)				BOF CAGES	(AQUACULTURE)
8021	QUE, PISCICULTURE ALLEGHANYS	1988	100000	EGGS	NB, GREEN ACRES TF (REARING)				MONCTON	(AQUACULTURE)
8020	WA, BEITEYS RESORT	1988	125000	EGGS	NB, EDWARD EUSTACE (REARING)				SUSSEX	(AQUACULTURE)
9004	PEI, BROOKVALLEY MARINE	1989	4350	EGGS	NB, MASCARINE MARICULTURE				MASCARINE	(AQC) ?
9005	ONT, RAINBOW SPRINGS HATCHERY	1989	100000	EGGS	NB, MEDARD CORMIER, MONCTON					
9006	PEI, GLYNDE RIVER AQUACULTURE	1989	20000	EGGS	NB, B GATES/BELLEISLE CREEK					
9013	ONT, AQUAFARMS CANADA LTD	1989	75000	EGGS	NB, ALVIN CRAFT/HATFIELD POINT					
0001	PEI, INTEGRATED AQUATICS	1990	5000	EGGS	NB, NB COMMUNITY COLLEGE/ST.ANDREWS					
0002	PEI, BROOKVALLEY MARINE	1990	1900	FING	NB, M.LEGERE/FORTUNE					
0003	ONT, RAINBOW SPRINGS HATCHERY	1990	50000	EGGS	NB, MEDARD CORMIER/MONCTON					
0004	QUE, PISCICULTURE ALLEGHANYS	1990	600	FING	NB, MICHEL BIRON/FREDERICTON					
0005	ONT, RAINBOW SPRINGS HATCHERY	1990	2000	FING	NB, POLLUTECH ENVIRONMENT/BATHURST					
1013	ONT, RAINBOW SPRINGS HATCHERY	1991	1000	FING	NB, POLLUTECH/CARAQUET					
1014	QUE, PISCICULTURE ALLEGHANYS	1991	20000	EGGS	NB, GREENACRES FARM/GRAND DIGUE					
1015	QUE, PISCICULTURE ALLEGHANYS	1991	20000	FING	NB, MEDARD CORMIER/MONCTON					
1016	PEI, BROOK VALLEY MARINE	1991	10000	FING	NB, LEGERE FARM/ROBICHAUD					
1017	PEI, DOVER HAT,MURRAY RIVER	1991	500	FING	NB, WOLVERTON HAT/CENTREVILLE					
1018	PEI, BROOK VALLEY MARINE	1991	6000	FING	NB, LEGERE FARM/ROBICHAUD					
1019	ONT, RAINBOW SPRINGS H,THAMESFORD	1991	1000	FING	NB, DEWINK IND/CARAQUET					
1020	PEI, BROOK VALLEY MARINE	1991	1800	FING	NB, LEGERE FARMS/ROBICHAUD					
1021	QUE, PISCICULTURE ALLEGHANYS	1991	40000	EGGS	NB, ALVIN CRAFT/HATFIELD PT					
1022	QUE, PISCICULTURE ALLEGHANYS	1991	80000	EGGS	NB, ALVIN CRAFT/HATFIELD PT					
1023	QUE, PISCICULTURE ALLEGHANYS	1991	200000	EGGS	NB, CLAUDE NADEAU/EDMUNSTON					
1026	QUE, PISCICULTURE ALLEGHANYS	1991	20000	EGGS	NB, GREENACRES H/GRANDE DIGUE					
2026	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	1000	FISH	NB, DEWINK IND/CARAQUET					
2027	MAN, ROCKWOOD AQUACULTURE	1992	12000	EGGS	NB, UNB/DR BENFEY/FREDERICTON					
2028	ONT, AQUAFARMS CANADA LTD	1992	50000	EGGS	NB, EDWARD GATES/DELISLE CREEK					
2031	QUE, PISCICULTURE ALLEGHANYS	1992	10000	EGGS	NB, EDWARD GATES/DELISLE CREEK					
2035	QUE, PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NB, ALVIN CRAFT/HATFIELD POINT					
2037	QUE, PISCICULTURE ALLEGHANYS	1992	25000	EGGS	NB, LEGER FISH FARM/ROBICHAUD					
2038	PEI, BROOK VALLEY MARINE	1992	25000	EGGS	NB, JARVIS DUCEY/HATFIELD POINT					
2041	QUE, PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NB, WOLVERTON MOUNTAIN FF/CENTREVILLE				STERILE FEMALES	
2043	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	1000	FISH	NB, DEWINK IND/CARAQUET					
3022	ONT, RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NB, DEWINK IND/CARAQUET					
3044	ONT, RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NB, DEWINK IND/CARAQUET					
3057	ONT, RAINBOW SPRINGS H, THAMESFORD	1993	500	FISH	NB, DEWINK IND/CARAQUET					
3069	QUE, PISCICULTURE ALLEGHANYS	1994	10000	EGGS	NB, TAMARACK FISH FARM/GAGETOWN					
4001	QUE, PISCICULTURE ALLEGHANYS	1994	35000	EGGS	NB, GREENACRES H/GRANDE DIGUE (AQUACULTURE)					

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEW BRUNSWICK

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT] CONTINUED										
4002 QUE,	PISCICULTURE ALLEGHANYS	1994	10000	EGGS	NB, TAMARACK FISH FARM/GAGETOWN (AQUACULTURE)					
4003 QUE,	PISCICULTURE ALLEGHANYS	1994	60000	EGGS	NB, ALVIN CRAFT/HATFIELD POINT (AQUACULTURE)					
4004 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	500	FISH	NB, DEWINK IND/CARAQUET (BIOASSAY)					
4005 QUE,	PISCICULTURE ALLEGHANYS	1994	50000	EGGS	NB, WOLVERTON MOUNTAIN FF/CENTREVILLE (AQUACULTURE)					
4006 QUE,	PISCICULTURE ALLEGHANYS	1994	300	FISH	NB, WOLVERTON MOUNTAIN FF/CENTREVILLE (AQUACULTURE)					
4007 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	500	FISH	NB, DEWINK IND/CARAQUET (BIOASSAY)					
5001 QUE,	PISCICULTURE ST-DAMIEN	1995	25000	EGGS	NB, TAMARACK FISH FARM/GAGETOWN (AQUACULTURE)					
5002 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	6000	EGGS	NB, NADEAU FISH FARMS LTD/EDMUNDSTON (AQUACULTURE)					
5003 PEI,	BROOK VALLEY MARINE FARM, FORTUNE	1995	2000	FISH	NB, MONCTON BOARDWALK THEME PARK (AQUACULTURE)					
5004 QUE,	PISCICULTURE ST-DAMIEN	1995	50000	EGGS	NB, ALVIN CRAFT/HATFIELD POINT (AQUACULTURE)					
5005 PEI,	BROOK VALLEY MARINE FARM, FORTUNE	1995	10000	EGGS	NB, WALTER FRIARS MISTY MOUNTAIN U FISH (AQUACULTURE)					
5006 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	50000	FISH	NB, GREENACRES FISH HATCHERY/GRANDE DIGUE (AQUACULTURE)					
5007 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	25000	EGGS	NB, BILL KNORR/SAINT JOHN (AQUACULUTRE)					
5008 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	5000	FISH	NB, BILL KNORR/SAINT JOHN (AQUACULUTRE)					
5009 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	500	FISH	NB, WINK INDUSTRIES/CARAQUET (BIOASSAY)					
5010 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	10000	FISH	NB, ATLANTIC INSTITUTION/RENOUS (AQUACULTURE)					
5011 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1200	FISH	NB, CURRIE & BUCHANAN ENVIRONMENTAL LTD/FREDERICTON (BIOASSAY)					
5012 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	25000	EGGS	NB, WALTER FRIARS MISTY MOUNTAIN U FISH (AQUACULTURE)					
5013 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1500	FISH	NB, CURRIE & BUCHANAN ENVIRONMENTAL LTD/FREDERICTON (BIOASSAY)					
5014 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	50000	EGGS	NB, TAMARACK FISH FARM/GAGETOWN (AQUACULTURE)					
OSMERUS MORDAX [RAINBOW SMELT]										
6002 NB,	(SUCKER BROOK, SKIFF LAKE)	1986	50000	E EGGS	NB, NBDNRE					UNIQUE L (LL SALMON FORAGE)
SALMO SALAR [ATLANTIC SALMON]										
2056 ME,	KENNEBEC AQUACULTURE	1992	20000	FISH	NB, HARBOUR BREEZE FISHERIES/ST GEORGE					
2057 ME,	KENNEBEC AQUACULTURE	1992	40000	FISH	NB, NORDIC ENTERPRISES/DEER ISLAND					
2058 ME,	KENNEBEC AQUACULTURE	1992	210000	FISH	NB, GRAY AQUAFARMS LTD/HAMPTON					
2059 ME,	KENNEBEC AQUACULTURE	1992	100000	FISH	NB, GRAY AQUAFARMS LTD/HAMPTON					
3028 ME,	KENNEBEC AQUACULTURE	1993	153000	FISH	NB, CONNORS BROTHERS/LAKE UTOPIA					
3029 PE,	BROOK VALLEY MARINE FARM (ST JOHN)	1993	5000	FISH	NB, JAIL ISLAND SALMON LTD/ST GEORGE					
3031 ME,	KENNEBEC AQUACULTURE	1993	25000	FISH	NB, AQUAVENTURES LTD/BACK BAY					
3033 ME,	KENNEBEC AQUACULTURE	1993	21000	FISH	NB, QUODDY SALMON LTD/DEER ISLAND					
3034 ME,	KENNEBEC AQUACULTURE	1993	21000	FISH	NB, B.J. SALMON/ST GEORGE					
3038 ME,	KENNEBEC AQUACULTURE	1993	6800	PARR1+	NB, CONNORS BROTHERS/BLACKS HARBOUR					
3039 ME,	KENNEBEC AQUACULTURE	1993	135000	FRY	NB, CONNORS BROTHERS/BLACKS HARBOUR					
3040 ME,	KENNEBEC AQUACULTURE	1993	13500	PARR1+	NB, GLEN COOK/ST GEORGE					
3043 ME,	KENNEBEC AQUACULTURE	1993	20500	FISH	NB, LAKE UTOPIA HATCHERY/LAKE UTOPIA					
3046 ME,	KENNEBEC AQUACULTURE	1993	85000	PARR0+	NB, LAKE UTOPIA HATCHERY/LAKE UTOPIA					
3049 ME,	KENNEBEC AQUACULTURE	1993	30000	FISH	NB, LAKE UTOPIA HATCHERY/LAKE UTOPIA					
4008 ME,	KENNEBEC AQUACULTURE	1994	35000	SMOLT	NB, AQUAVENTURES LTD/BACK BAY (AQUACULTURE)					
4009 ME,	KENNEBEC AQUACULTURE	1994	21000	SMOLT	NB, SEAVIEW SALMON/BACK BAY (AQUACULTURE)					
4010 ME,	KENNEBEC AQUACULTURE	1994	25000	SMOLT	NB, ELDRIDGE FISHERIES/CONNORS BROS/BEAVER HARBOUR (AQUACULTURE)					
4011 ME,	KENNEBEC AQUACULTURE	1994	25000	SMOLT	NB, JAIL ISLAND SALMON/ST GEORGE (AQUACULTURE)					
4012 ME,	ATLANTIC AQUAFARMS INC	1994	7000	SMOLT	NB, HARBOUR DeLOUTRE PRODUCTS/CAMPOBELLO (AQUACULTURE)					
4013 ME,	DeBLOIS HATCHERY/EASTPORT	1994	150000	SMOLT	NB, CONNORS BROS/FAIRHAVEN, DEER ISLAND (AQUACULTURE)					
4014 NS,	MERLIN FISH FARM	1994	36000	SMOLT	NB, L&J SALMON LTD/ST GEORGE (AQUACULTURE)					
4015 NS,	MERLIN FISH FARM	1994	36000	SMOLT	NB, FUNDY SALMON LTD/GT GEORGE (AQUACULTURE)					
4016 ME	KENNEBEC AQUACULTURE	1994	420000	SMOLT	NB, GRAY AQUA FARMS LTD/HAMPTON (AQUACULTURE)					
4017 ME,	ATLANTIC AQUAFARMS	1994	4000	SMOLT	NB, HARBOUR DeLOUTRE PRODUCTS/CAMPOBELLO (AQUACULTURE)					
4018 NS,	MERLIN FISH FARM	1994	150000	SMOLT	NB, ATLANTIC SILVER CO-OP H/ST GEORGE (AQUACULTURE)					
4019 ME,	DeBLOIS HATCHERY/CHERRYFIELD	1994	70000	FISH	NB, LAKE UTOPIA HATCHERY/LAKE UTOPIA (AQUACULTURE)					
4020 ME,	KENNEBEC AQUACULTURE	1994	80	SMOLT	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE (STRESS TESTING)					
4021 ME,	KENNEBEC AQUACULTURE	1994	25200	SMOLT	NB, NORDIC ENTERPRISES/LIMEKILN BAY (AQUACULTURE)					
4022 ME,	KENNEBEC AQUACULTURE	1994	16800	SMOLT	NB, AQUAVENTURES LTD/BACK BAY (AQUACULTURE)					
5015 NFLD,	MEMORIAL U (TRG/GROWTH HORMONE)	1995	2	VIALS	NB, DFO, SAINT ANDREWS BIOLOGICAL	1996		FING	SAINT ANDREWS BIOLOGICAL STA	(RESEARCH)
5016 NFLD,	MEMORIAL U (TRG/GROWTH HORMONE)	1995	2	VIALS	NB, DFO, HUNTSMAN MARINE SCIENCE C	1996		FING	HUNTSMAN CENTRE/SAINT ANDREWS	(RESEARCH)
5017 NFLD,	MEMORIAL U (TRG/GROWTH HORMONE)	1994	1-2	VIALS	NB, DFO, HUNTSMAN MARINE SCIENCE C	1995		FING	HUNTSMAN CENTRE/SAINT ANDREWS	(RESEARCH)
5018 NFLD,	MEMORIAL U (TRG/WNTR FLDR ANT)	1994	1-2	VIALS	NB, DFO, HUNTSMAN MARINE SCIENCE C	1995		FING	HUNTSMAN CENTRE/SAINT ANDREWS	(RESEARCH)
5019 ME,	KENNEBEC AQUACULTURE	1995	60	FISH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE				(STRESS TESTING/QUARANTINE)	
5020 ME,	ATLANTIC AQUAFARMS	1995	60	FISH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE				(STRESS TESTING/QUARANTINE)	
5021 NH,	NEW ENGLAND FISH FARMING/BRISTOL	1995	60	FISH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE				(STRESS TESTING/QUARANTINE)	
5022 ME,	CONNORS AQUACULTURE, DEBLOIS H	1995	60	FISH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE				(STRESS TESTING/QUARANTINE)	

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FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	YEAR	NUMBER	STAGE	TRANSFERS SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
SALMO SALAR [ATLANTIC SALMON] CONTINUED									
5023 ME,	BINGHAM AQUACULTURE LTD	1995	60	FISH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE (STRESS TESTING/QUARANTINE)				
5024 ME,	BINGHAM AQUACULTURE LTD	1995	175000	FISH	NB, FULFORD INGALLS SEAFOOD HOLDINGS/ST GEORGE (AQUACULTURE)				
5025 NH,	NEW ENGLAND FISH FARMING (ST JOHN)	1995	28000	FISH	NB, SEA VIEW SALMON LTD/BACK BAY (AQUACULTURE)				
5026 NH,	NEW ENGLAND FISH FARMING (ST JOHN)	1995	28000	FISH	NB, AQUAVENTURES/BACK BAY (AQUACULTURE)				
5027 ME,	ATLANTIC AQUAFARMS INC	1995	7800	FISH	NB, HARBOUR DELOUTRE/CAMPOBELLO (AQUACULTURE)				
5028 ME,	CONNORS AQUACULTURE, DEBLOIS H	1995	50000	FISH	NB, CONNORS AQUACULTURE, LAKE UTOPIA HATCHERY (AQUACULTURE)				
5029 ME,	CONNORS AQUACULTURE, DEBLOIS H	1995	50000	FISH	NB, CONNORS BROS, HW WELCH CAGE SITE/FAIRHAVEN (AQUACULTURE)				
5030 PEI,	ATLANTIC SEA SMOLT (ST JOHN)	1995	20000	FISH	NB, JAIL ISLAND SALMON LTD/ST GEORGE (AQUACULTURE)				
5031 PEI,	ATLANTIC SEA SMOLT (ST JOHN)	1995	5000	FISH	NB, AQUA VENTURES LTD/BACK BAY (AQUACULTURE)				
5032 NS,	MERLIN FISH FARM/WENTWORTH (ST JOHN)	1995	60000	FISH	NB, FUNDY SALMON LTD/BACK BAY (AQUACULTURE)				
5033 NS,	MERLIN FISH FARM/WENTWORTH (ST JOHN)	1995	60000	FISH	NB, L&J SALMON LTD/BACK BAY (AQUACULTURE)				
5034 ME,	KENNEBEC AQUACULTURE	1995	100000	FISH	NB, GRAY AQUAFARMS LTD/WOODSTOCK (AQUACULTURE)				
5035 ME,	KENNEBEC AQUACULTURE	1995	110000	FISH	NB, GRAY AQUAFARMS LTD/WOODSTOCK (AQUACULTURE)				
5036 ME,	CONNORS AQUACULTURE, DEBLOIS H	1995	75000	FISH	NB, GREEN ACRES FISH HATCHERY/GRANDE-DIGUE (AQUACULTURE)				
5037 NH,	NEW ENGLAND FISH FARMING (ST JOHN)	1995	60	FIAH	NB, NB DEPT OF FISHERIES & AQUACULTURE/ST GEORGE (STRESS TESTING/QUARANTINE)				
5038 ME,	CONNORS AQC, DEBLOIS H (ST JOHN)	1995	25000	FISH	NB, CONNORS BROS, HW WELCH CAGE SITE/FAIRHAVEN (AQUACULTURE)				
5039 ME,	CONNORS AQC, DEBLOIS H	1995	25000	FISH	NB, GREEN ACRES FISH HATCHERY/GRANDE-DIGUE (AQUACULTURE)				
SALMO SALAR [LANDLOCKED ATLANTIC SALMON]									
8019 ME,	GRAND LK STREAM H (WEST GRAND LK)	1988	35000	EGGS	NB, DFO/ST JOHN FCS (REARING)	P			(ENHANCEMENT)
9001 ME,	GRAND LAKE STREAM HATCHERY	1989	35000	EGGS	NB, DFO/SAINT JOHN FCS				
4073 ME,	GRAND LK STREAM H (WEST GRANK LK)	1994	115000	G EGGS	NB, NBDNRE/FLOWERS COVE HATCHERY				
5040 ME	WEST GRAND LAKE H, GRAND LAKE STR	1994	100000	G EGGS	NB, NBDNRE/FLOWERS COVE H (QUAR)	1995		FING	(ENHANCEMENT)
SALMO TRUTTA [BROWN TROUT]									
7022 NB,	FLOWERS COVE H (LOCH LOMOND)	1987	10000	JUV	NB, NBDNRE				EAST MUSQUASH R
8005 NB,	FLOWERS COVE H (LOCH LOMOND)	P1988	10000	JUV	NB, NBDNRE				EAST MUSQUASH R
SALVELINUS ALPINUS [ARCTIC CHAR]									
8006 MAN,	ROCKWOOD H (FRASER R, LABRADOR)	1988	3000	EGGS	NB, BOUCTOUCHE INDIAN BAND				BUCTOUCHE (AQUACULTURE)
NB,	FLOWERS COVE H (WALTON LAKE)*	1989	1000	JUV					SECOND KEDRON LAKE
9002 MAN,	ROCKWOOD HATCHERY	1989	5000	EGGS	NB, GREEN ACRES TROUT FARM/MONCTON				BUCTOUCHE (AQC) ?
9003 MAN,	ROCKWOOD HATCHERY	1989	5000	EGGS	NB, BOUCTOUCHE INDIAN BAND				
9012 MAN,	ROCKWOOD HATCHERY	1989	3000	EGGS	NB, SEA FARMS CANADA/SUSSEX				
0006 PEI,	BROOKVALLEY MARINE	1990	40000	EGGS	NB, GREEN ACRES TROUT FARM/MONCTON				
1024 PEI,	INTEGRATED AQUA	1991	4500	FRY	NB, HUNTSMAN MARINE LAB/ST ANDREWS				
1025 PEI,	INTEGRATED AQUA	1991	10000	FING	NB, ROGER GIONET/SHIPPEGAN				
2062 MAN,	ROCKWOOD HATCHERY	1992	45000	EGGS	NB, GREEN ACRES TF/GRANDE-DIQUE				
2063 MAN,	ROCKWOOD HATCHERY (LABRADOR)	1992	6000	EGGS	NB, GREEN ACRES TF/GRANDE-DIQUE				
3020 MAN,	ROCKWOOD AQUACULTURE RESEARCH	1993	6000	EGGS	NB, DR TILLMANN BENFEY, UNB/FREDERICTON				
3052 MAN,	ROCKWOOD AQUACULTURE (LABRADOR)	1993	6000	EGGS	NB, DR TILLMANN BENFEY, UNB/FREDERICTON				
4023 QUE,	PISCICULUTRE ALLEGHANYS	1994	1000	FRY	NB, UNIVERSITY OF NEW BRUNSWICK (RESEARCH)				
4024 MAN,	ROCKWOOD AQUACULTURE RESEARCH	1994	2000	EGGS	NB, ROBYN O'KEEFE, UNB (RESEARCH)				
5041 QUE,	PISCICULTURE ST-DAMIEN	1995	3500	FISH	NB, PLACEMENTS GGR LTEE/BAS-CARAQUET (AQUACULTURE)				
SALVELINUS FONTINALIS [BROOK TROUT]									
7020 QUE,	PISCICULTURE ALLEGHANYS	1987	100000	EGGS	NB, ATLANTIS SEA FARMS				CLIFTON ROYAL (AQUACULTURE)
7019 QUE,	PISCICULTURE ALLEGHANYS	1987	180000	EGGS	NB, DOUGLAS DAIGLE/RICHIBUCTO				RICHIBUCTO (AQUACULTURE)
7021 QUE,	PISCICULTURE ALLEGHANYS	1987	130000	FING	NB, PIERRE MORIN				GRAND FALLS (AQUACULTURE)
8018 QUE,	PISCICULTURE ALLEGHANYS	1988	30000	FING	NB, PIERRE MORIN (REARING)				GRAND FALLS (AQUACULTURE)
8016 QUE,	PISCICULTURE ALLEGHANYS	1988	4000	FING	NB, GILLES CORMIER (REARING)				GRAND FALLS (AQUACULTURE)
8015 ME,	PHILLIPS HATCHERY	1988	150000	EGGS	NB, FLOWERS COVE H (REARING)				
8014 QUE,	PISCICULTURE ALLEGHANYS	1988	100000	EGGS	NB, RONALD NOWLAN (REARING)				POKEMOUCHE (AQUACULTURE)
8013 QUE,	PISCICULTURE ALLEGHANYS	1988	20000	EGGS	NB, JAMES McCRAE (REARING)				SAINT JOHN (AQUACULTURE)
8012 QUE,	PISCICULTURE ALLEGHANYS	1988	75000	EGGS	NB, ALVIN CRAFT (REARING)				HATFIELD PT (AQUACULTURE)
8011 QUE,	PISCICULTURE ALLEGHANYS	1988	300000	EGGS	NB, DOUGLAS DAIGLE (REARING)				RICHIBUCTO (AQUACULTURE)
8010 QUE,	PISCICULTURE ALLEGHANYS	1988	75000	EGGS	NB, NOEL BOSSE (REARING)				EDMUNDSTON (AQUACULTURE)
8009 QUE,	PISCICULTURE ALLEGHANYS	1988	200000	EGGS	NB, REGINALD BOSSE (REARING)				EDMUNDSTON (AQUACULTURE)
8008 QUE,	PISCICULTURE ALLEGHANYS	1988	200000	EGGS	NB, GREEN ACRES TF (REARING)				MONCTON (AQUACULTURE)
8007 QUE,	PISCICULTURE ALLEGHANYS	1988	50000	EGGS	NB, WILLIAM KNOW (REARING)				SAINT JOHN (AQUACULTURE)
9007 ONT,	WILDCAT TROUT FARM	1989	20000	EGGS	NB, D DAIGLE (REARING)				RICHIBUCTO (AQUACULTURE)
9008 PEI,	BROOK VALLEYMARINE	1989	120	FISH	NB, ROBERT METHE (REARING)				SALISBURY (AQUACULTURE)
9009 PEI,	BROOKVALLEY MARINE	1989	25000	EGGS	NB, BILL KNOR/GAGETOWN				

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEW BRUNSWICK

FILE	ORIGINAL SOURCE			TRANSFERS					FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
SALVELINUS FONTINALIS [BROOK TROUT] (CONTINUED)										
9010	PEI, BROOKVALLEY MARINE	1989	5500	FISH	NB, BILL KNOR/GAGETOWN					
9011	PEI, BROOKVALLEY MARINE	1989	21000	EGGS	NB, L McCRAE/HATFIELD POINT					
0007	PEI, BROOKVALLEY MARINE	1990	20000	FING	NB, NBDNRE/MINTO					
0008	WA, BEITEYS RESORT	1990	60000	EGGS	NB, GREEN ACRES TF (REARING)				MONCTON	(AQUACULTURE)
0009	WA, BEITEYS RESORT	1990	50000	EGGS	NB, ALVIN CRAFT (REARING)				HATFIELD PT	(AQUACULTURE)
0010	WA, BEITEYS RESORT	1990	50000	EGGS	NB, GREEN ACRES TF (REARING)				MONCTON	(AQUACULTURE)
0011	PEI, BROOKVALLEY MARINE	1990	6000	FING	NB, BILL KNORR/SAINT JOHN					
0012	QUE, PISCICULTURE ALLEGHANYS	1990	200000	EGGS	NB, GREEN ACRES TF (REARING)				MONCTON	(AQUACULTURE)
0013	QUE, PISCICULTURE ALLEGHANYS	1990	300000	EGGS	NB, DOUGLAS DAIGLE (REARING)				RICHIBUCTO	(AQUACULTURE)
0014	QUE, PISCICULTURE ALLEGHANYS	1990	275000	EGGS	NB, REGINALD BOSSE (REARING)				EDMUNDSTON	(AQUACULTURE)
0015	QUE, PISCICULTURE ALLEGHANYS	1990	50000	EGGS	NB, ALVIN CRAFT (REARING)				HATFIELD PT	(AQUACULTURE)
0016	PEI, BROOKVALLEY MARINE	1990	60000	EGGS	NB, LEGERE FISH FARM/CAPE PELE					
0017	QUE, PISCICULTURE ALLEGHANYS	1990	25000	EGGS	NB, McCREA FARM LTD/HATFIELD POINT					
0018	QUE, PISCICULTURE ALLEGHANYS	1990	50000	FING	NB, MEDARD CORMIER/MONCTON					
0019	ME, PHILLIPS HATCHERY	1990	20000	EGGS	NB, NBDNRE/FLOWERS COVE (QUAR)					
1001	ME, PHILLIPS HATCHERY	1991	20000	EGGS	NB, NATURAL RESOURCES/FLOWERS COVE					
1002	QUE, PISCICULTURE ALLEGHANYS	1991	20000	FING	NB, RON NOWLAND ENT POKEMOUCHE					
1003	PEI, BROOK VALLEY MARINE,SOURIS	1991	20000	FING	NB, LEGERE FISH FARM/ROBICHAUD					
1004	QUE, PISCICULTURE ALLEGHANYS	1991	50000	EGGS	NB, LEGERE FISH FARMS/ROBICHAUD					
1005	QUE, PISCICULTURE ALLEGHANYS	1991	150000	EGGS	NB, DAIGLES TROUT FARM/RICHIBUCTO					
1006	QUE, PISCICULTURE ALLEGHANYS	1991	150000	EGGS	NB, REGINALD BOSSE/EDMUNSTON					
1007	QUE, PISCICULTURE ALLEGHANYS	1991	25000	EGGS	NB, MCCREA FARMS/HATFIELD PT					
1008	QUE, PISCICULTURE ALLEGHANYS	1991	20000	EGGS	NB, ALVIN CRAFT/HATFIELD PT					
1009	PEI, BROOK VALLEY MARINE,SOURIS	1991	40000	EGGS	NB, LEGERE FISH FARMS/ROBICHAUD					
1010	PEI, BROOK VALLEY MARINE,SOURIS	1991	80000	EGGS	NB, DUCEY&SONS FISH F/HATFIELD PT					
1011	QUE, PISCICULTURE ALLEGHANYS	1991	50000	EGGS	NB, CLARENCE LEVESQUE/CHARLO					
1012	ME, PHILLIPS STATE HATCHERY	1912	50000	EGGS	NB, NBFWB/FLOWERS COVE QUARANTINE					
2066	PEI, BROOK VALLEY MARINE,SOURIS	1992	30000	EGGS	NB, CLIVE WILSON/FREDERICTON					
2067	PEI, BROOK VALLEY MARINE,SOURIS	1992	15000	FISH	NB, GREEN ACRES TF/GRANDE-DIQUE					
2068	PEI, BROOK VALLEY MARINE,SOURIS	1992	75000	FISH	NB, JEAN MARIE MARTIN/NEW DENMARK					
2069	PEI, BROOK VALLEY MARINE,SOURIS	1992	5000	FISH	NB, FRANCIS BELENANS/HAMSTEAD					
2070	PEI, BROOK VALLEY MARINE,SOURIS	1992	50000	FISH	NB, FRANCIS BELENANS/HAMSTEAD					
2071	QUE, PISCICULTURE ALLEGHANYS	1992	5000	FISH	NB, GREEN ACRES TROUT HAT/GRANDE-DIQUE					
2072	PEI, BROOK VALLEY MARINE,SOURIS	1992	4000	FISH	NB, DUCEY&SONS FF/HATFIELD PT					
2073	QUE, PISCICULTURE ALLEGHANYS	1992	15000	FISH	NB, RON NOWLAN ENTERPRISES/POKEMOUCHE					
2074	PEI, BROOK VALLEY MARINE,SOURIS	1992	2000	FISH	NB, HENRY GOGUEN/COCAGNE					
2075	QUE, PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NB, ALVIN KRAFT/HATFIELD POINT					
2076	QUE, PISCICULTURE ALLEGHANYS	1992	200000	EGGS	NB, PAUL NAPEAU/EDMUNDSTON					
2077	QUE, PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NB, CLARENCE LEVESQUE/CHARLO					
2078	QUE, PISCICULTURE ALLEGHANYS	1992	35000	EGGS	NB, LEGERE FISH FARM/ROBICHAUD					
2079	QUE, PISCICULTURE ALLEGHANYS	1992	125000	EGGS	NB, REGINALD BOSSE/EDMUNDSTON					
2080	QUE, PISCICULTURE ALLEGHANYS	1992	25000	EGGS	NB, MCCREA FARMS/HATFIELD					
2083	ME, PHILLIPS STATE FISH HATCHERY	1992	110000	EGGS	NB, NBNDRE/FLOWERS COVE		100000			
2084	PEI, BROOK VALLEY MARINE,SOURIS	1992	100000	FISH	NB, FRANCIS BELENANS/HAMSTEAD					
3018	PEI, BROOK VALLEY MARINE,SOURIS	1993	75000	FISH	NB, JEAN MARIE MARTIN/DENMARK					
3019	PEI, BROOK VALLEY MARINE,SOURIS	1993	7000	FISH	NB, ROBERT CAREY/FLORENCEVILLE					
3024	PEI, BROOK VALLEY MARINE,SOURIS	1993	30000	FISH	NB, LEGERE FISH FARM/ROBICHAUD					
3037	PEI, BROOK VALLEY MARINE,SOURIS	1993	2000	FISH	NB, HENRY GOGUEN/COCAGNE					
3054	QUE, PISCICULTURE ALLEGHANYS	1993	30000	EGGS	NB, MCCREA FARMS/HATFIELD					
3056	QUE, PISCICULTURE ALLEGHANYS	1993	200000	EGGS	NB, REGINALD BOSSE/EDMUNDSTON					
3058	QUE, PISCICULTURE ALLEGHANYS	1993	45000	EGGS	NB, CLARENCE LEVESQUE/CHARLO					
3059	QUE, PISCICULTURE ALLEGHANYS	1993	200000	EGGS	NB, PAUL NADEAU/EDMUNDSTON					
3060	PEI, BROOK VALLEY MARINE,SOURIS	1993	10000	EGGS	NB, KENNETH STEVENS/FLORENCEVILLE					
3063	ME, PHILLIPS STATE FISH HATCHERY	1993&94	200000	EGGS	NB, NB DEPT OF NATURAL RESOURCES					
3065	QUE, PISCICULTURE ALLEGHANYS	1994	25000	FRY	NB, ALVIN CRAFT/HATFIELD POINT					
3066	PEI, BROOK VALLEY MARINE,SOURIS	1994	150000	FISH	NB, JEAN MARIE MARTIN/DENMARK					
3067	PEI, BROOK VALLEY MARINE,SOURIS	1994	10000	FISH	NB, KENNETH STEVENS/FLORENCEVILLE					
4025	QUE, PISCICULTURE ALLEGHANYS	1994	25000	FRY	NB, ALVIN CRAFT/HATFIELD POINT (AQUACULTURE)					
4026	PEI, BROOK VALLEY MARINE,SOURIS	1994	150000	FISH	NB, JEAN MARIE MARTEN/NEW DENMARK (AQUACULTURE)					
4027	PEI, BROOK VALLEY MARINE,SOURIS	1994	10000	FISH	NB, KENNETH STEVENS/FLORENCEVILLE (AQUACULTURE)					
4028	QUE, PISCICULTURE ALLEGHANYS	1994	2000	FISH	NB, ROBYN O'KEEFE/UNB (RESEARCH)					
4029	PEI, BROOK VALLEY MARINE,SOURIS	1994	1000	FISH	NB, HENERY GOGUEN/COCAGNE (AQUACULTURE)					
4030	QUE, PISCICULUTRE ALLEGHANYS	1994	80000	FISH	NB, DOUGLAS DAIGLE/RICHIBUCTO (AQUACULTURE)					

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 NEW BRUNSWICK

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER STAGE	LOCATION	(PURPOSE)
SALVELINUS FONTINALIS [BROOK TROUT] (CONTINUED)										
4073	QUE, PISCICULTURE LAC ST-FRANCOIS	1995	80000	EGGS	PLACEMENTS GGR LTEE/BAR CARAQUET (AQUACULTURE)					
5042	QUE, PISCICULTURE LAC ST-FRANCOIS	1995	100000	EGGS	PLACEMENTS GGR LTEE (AQUA CHAR)/BAS-CARAQUET (AQUACULTURE)					
5043	QUE, PISCICULTURE ST-DAMIEN	1995	20000	EGGS	BILL KNORR/SAINT JOHN (AQUACULTURE)					
SALVELINUS FONTINALIS X SALVELINUS ALPINUS [CHARBROOK]										
8004	NB, FLOWERS COVE H (WALTON X PHILLIPS)	P1988	10000	JUV	NB, NBDNRE				MINE PONDS	
SALVELINUS NAMAYCUSH X SALVELINUS FONTINALIS [SPLAKE]										
6001	NB, FLOWERS COVE H (CLEAR X PHILLIPS)	1986	100	YEAR	NB, NBDNRE				NORTH LAKE (EXP STOCKING)	
6001		1986	550	YEAR						
PEABODY LK (EXP STOCKING)										
6001		1986	100	YEAR					BLIND LAKE (EXP STOCKING)	
7023	NB, FLOWERS COVE H (CLEAR X PHILLIPS)	1987	2000	JUV	NB, NBDNRE				MULLIN STREAM LAKE	
7023		1987	500	JUV					BIG MEADOW POND	
7023		1987	2000	JUV					NL RIVER LAKE	
7023		1987	150	JUV					GRAND MANAN	
7023		1987	175	JUV					HARRIS LAKE	
7023		1987	700	JUV					GLENN SEVERN	
8001	NB, FLOWERS COVE H (CLEAR X PHILLIPS)	P1988	5000	JUV	NB, NBDNRE				GRAND LAKE	
8001		P1988	2000	JUV					MULLIN STREAM	
8001		P1988	2000	JUV					NL RIVER LAKE	
	NB, FLOWERS COVE H (CLEAR X PHILLIPS)	P1989	5000	JUV					LAKE UTOPIA	
	NB, FLOWERS COVE H (CLEAR X PHILLIPS)	P1989	150	JUV					GOLDSMITHS LAKE	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEWFOUNDLAND

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	LOCATION (PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
6001	ONT, RAINBOW SPRINGS HATCHERY	1986	5000	5CM						
	ONT, RINGWOOD HATCHERY ?	1986	6700	JUV						HOPEALL CAGES (AQC)
7002	ONT, RAINBOW SPRINGS H (UNKNOWN)	1987	4000	JUV	NFLD, EPS/NWAFC TANKS (BIOASSAY)	P				HOPEALL CAGES ? (AQC)
7003	ONT, RAINBOW SPRINGS H (UNKNOWN)	1987	900	JUV	NFLD, MSRL TANKS (RESEARCH)	P				TO BE DESTROYED
7001	ONT, AQUAFARMS CANADA (UNKNOWN)	1987	300	JUV	NFLD, MSRL TANKS (RESEARCH)	P				TO BE DESTROYED
7004	ONT, RAINBOW SPRINGS H (UNKNOWN)	1987	10000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY	P				TO BE INCINERATED
7007	ONT, RAINBOW SPRINGS H (UNKNOWN)	1987	300	JUV	NFLD, DFO/NWAFC TANKS (RESEARCH)					BAY D'ESPOIR (AQUACULTURE)
8013	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	150	15 CM	NFLD, MSRL/MEMORIAL U (RESEARCH)					FISH DESTROYED
8012	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	500	15 CM	NFLD, NWAFC (RESEARCH)					ST JOHNS, STOCK DESTROYED
8010	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	500	10 CM	NFLD, DFO/NWAFC (RESEARCH)					ST JOHNS, STOCK DESTROYED
8009	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	500	7 CM	NFLD, DFO/NWAFC (RESEARCH)					ST JOHNS, STOCK DESTROYED
8015	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	2000	FRY	NFLD, EPS/NWAFC (BIOMONITORING)					ST JOHNS, STOCK DESTROYED
8016	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	2000	FRY	NFLD, EPS/NWAFC (BIOMONITORING)					
8008	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	2000	FRY	NFLD, EPS/NWAFC (BIOMONITORING)					ST JOHNS, STOCK DESTROYED
8017	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	30000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY					ST JOHNS, STOCK DESTROYED
8014	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	125000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY	P	1989			ST ALBANS, STOCK DESTROYED
8011	ONT, RAINBOW SPRINGS H (HATCHERY)	1988	10000	EGGS	NFLD, MARINE INSTITUTE					ROTI BAY CAGES (AQC)
8007	ONT,	1988	600	FING	NFLD, BAY D'ESPOIR HATCHERY					ST JOHNS, STOCK DESTROYED
8006	ONT,	1988	100000	EGGS	NFLD, BAY D'ESPOIR HATCHERY					
9011	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1989	50	30-50G	NFLD, MINL/MINL TANKS (TEACHING)	P				TO BE DESTROYED
9009	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1989	2000	0.5 G	NFLD, DOE/NWAFC (BIOMONITORING)	P				TO BE DESTROYED
9008	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1989	2000	0.5 G	NFLD, DOE/NWAFC (BIOMONITORING)	P				TO BE DESTROYED
9007	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1989	75000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY	P	1990			ROTI BAY CAGES (AQC)
9006	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1989	600	13 CM	NFLD, OSL/BAY D'ESPOIR H (RESEARCH)	P				TO BE DESTROYED
9010	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*1990	5000	E EGG	NFLD, MINL/MINL TANKS (TEACHING)	P				ST JOHNS, TO BE DESTROYED
0001	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	200	FISH	NFLD, DOE/NWAFC (EXPERIMENTAL)					STOCK DESTROYED
0002	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	60000	E EGG	NFLD, BAY D'ESPOIR HATCHERY	P				SEA CAGES
0003	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	0.5-1G	NFLD, LEDREW FUDGE (BIOASSAY)					STOCK DESTROYED
0005	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	2000	0.5 G	NFLD, ENV PROTECTION (BIOASSAY)					STOCK DESTROYED
0006	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	0.5-1G	NFLD, LEM LAB INC (BIOASSAY)					STOCK DESTROYED
0007	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	10-15CM	NFLD, NWAFC (INFECTION EXPERIMENTS)					STOCK DESTROYED
0008	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	20000	E EGGS	NFLD, BAY D'ESPOIR HATCHERY	P				SEA CAGES
0009	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	1500	0.5 G	NFLD, ENV PROTECTION (BIOASSAY)					STOCK DESTROYED
0011	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	1500	40 MM	NFLD. SMBDA/HOLYROOD POND					(AQUACULTURE)
0012	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	0.5-1G	NFLD, LEM LAB INC (BIOASSAY)					STOCK DESTROYED
0013	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	10-15CM	NFLD, NWAFC (IMMUNOLOGY)					STOCK DESTROYED
0015	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	500	1-2 G	NFLD, LEM LAB INC (BIOASSAY)					STOCK DESTROYED
0016	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	1000	0.5-1G	NFLD, LEM LAB INC (BIOASSAY)					STOCK DESTROYED
0017	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	200	FISH	NFLD, MARINE INSTITUTE (EXP)					STOCK DESTROYED
0018	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	130000	E EGG	NFLD, BAY D'ESPOIR HATCHERY	P				SEA CAGES
0019	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	1500	0.5 G	NFLD, ENV PROTECTION (BIOASSAY)					STOCK DESTROYED
0021	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	*	?		PEI, BROOK VALLEY MARINE		1990	1000	1-1.5G	SEE NEXT LINE
0021		*			NFLD, LEM LAB INC (BIOASSAY)					STOCK DESTROYED
0022	ONT, RAINBOW SPRINGS H (EX H/DOMESTIC)	1990	150	FISH	NFLD, MARINE INSTITUTE (EXP)					STOCK DESTROYED
1001	ONT, RAINBOW SPRINGS H (HATCHERY)	1991	150000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY		P1992			SEA CAGES
1002	ONT, RAINBOW SPRINGS H (DOMESTIC)	1991	2000	FISH	NFLD, MURRAY'S POND F&C CLUB					POND FOR ANGLING
1003	PEI, BROOKVALLEY MARINE FARM (DOMESTIC)	1991	3500	15 CM	NFLD, STEPHENVILLE IND DEV COMM					FISHOUT POND
1004	ONT, RAINBOW SPRINGS H (DOMESTIC)	1991	300000	TR EGG	NFLD, BAY D'ESPOIR HATCHERY		P1992			SEA CAGES
2006	ONT, RAINBOW SPRINGS H (DOMESTIC)	1992	30000	EGGS	NFLD, HOPEALL HATCHERY					FISHOUT POND
2007	QUE, PISCICULTURE ALLEGHANYS (DOMESTIC)	1992	150000	E EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1993			SEA CAGES
2008	QUE, PISCICULTURE ALLEGHANYS (DOMESTIC)	1992	6700	FISH	NFLD, BAY D'ESPOIR HATCHERY		P1993			SEA CAGES
2009	PEI, BROOKVALLEY MARINE FARM (DOMESTIC)	1992	52000	FISH	NFLD, BAY D'ESPOIR HATCHERY		P1993			SEA CAGES
2010	ONT, RAINBOW SPRINGS H (DOMESTIC)	1992	2500	EGGS	NFLD, MURRAY'S POND HATCHERY					MURRAY'S POND (SPORT FISHING)
2011	ONT, RAINBOW SPRINGS H (DOMESTIC)	1992	186000	EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1994			SEA CAGES
2012	PEI, BROOKVALLEY MARINE FARM (DOMESTIC)	1992	7500	FISH	NFLD, HAROLD SMITH/SPIRITY POND					SEA CAGES
3083	ONT, RAINBOW SPRINGS (DOM TRIPLOID)	1993	144700	EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1994			SEA CAGES
3084	QUE, PISCICULTURE ALLEGH (DOM TRIPLOID)	1993	600000	EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1994			SEA CAGES
3085	PEI, BROOKVALLEY MARINE FARM (DOMESTIC)	1993	25000	EGGS	NFLD, RAINBOW FARMS H/HOPEALL		P1994			FISHOUT POND
3086	PEI, BROOKVALLEY MARINE FARM (DOMESTIC)	1993	15000	FISH	NFLD, RAINBOW FARMS H/HOPEALL		1993			PUT&TAKE OPERATION IN POND
3087	QUE, PISCICULTURE ALLEGH (DOM TRIPLOID)	1993	500000	EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1994			SEA CAGES
3088	PEI, BROOKVALLEY MARINE F(DOM TRIPLOID)	1993	10000	FISH	NFLD, SPIRITY POND LTD/NORRIS PT		1993			SPORTFISHING
3089	MAN, ROCKWOOD HATCHERY (DOMESTIC)	1993	5000	EGGS	NFLD, NEW TECH CHAR F/PORT REXTON					BROODSTOCK DEVELOPMENT
4031	QUE, PISCICULTURE ALLEGHANY (TRIPLOID)	1994	500000	EGGS	NFLD, BAY D'ESPOIR HATCHERY		P1995			SEA CAGES

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NEWFOUNDLAND

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT] CONTINUED									
4032 QUE,	PISCICULTURE ALLEGHANY	1994	15000	FRY	NFLD, RAINBOW TROUT FARM/S DILDO	P1995			(FISHOUT POND)
5044 PEI,	BROOKVALLEY MARINE F(DOM TRIPLOID)	1995	2100	12-17C	NFLD, INDIAN BAY FISH FARMS BONAVISTA BAY (FISHOUT POND)				
5045 QUE,	PICICULTURE ST-DAMIEN (DOM TRIPLOID)	1995	750000	EGGS	NFLD, SCB FISHERIES HATCHERY (IPN, ATYPICAL FURUNCULOSIS, BKD, MOTILE AEROMONAS)				(SEA CAGES)
5046 QUE,	PICICULTURE ST-DAMIEN (DOM TRIPLOID)	1995	750000	EGGS	NFLD, SCB FISHERIES HATCHERY (IPN, ATYPICAL FURUNCULOSIS, BKD, MOTILE AEROMONAS)				(SEA CAGES)
5047 QUE,	PICICULTURE ST-DAMIEN (DOMESTIC)	1995	45000	EGGS	NFLD, RAINBOW TROUT FARMS/HOPEALL (GROWOUT AND FISHOUT POND)				
5048 QUE,	PICICULTURE ST-DAMIEN (DOMESTIC)	1995	21000	FRY	NFLD, RAINBOW TROUT FARMS/HOPEALL (GROWOUT AND FISHOUT POND)				
5049 QUE,	PICICULTURE ST-DAMIEN (DOM TRIPLOID)	1995	750000	EGGS	NFLD, SCB FISHERIES HATCHERY (IPN, ATYPICAL FURNUNCULOSIS, BKD, MOTILE AEROMONAS)				(SEA CAGES)
5050 QUE,	PICICULTURE ST-DAMIEN (DOM TRIPLOID)	1995	700000	EGGS	NFLD, SCB FISHERIES HATCHERY (IPN, ATYPICAL FURNUNCULOSIS, BKD, MOTILE AEROMONAS)				(SEA CAGES)
5051 ONT,	RAINBOW SPRINGS HATCHERY (DOMESTIC)	1995	2000	1 GRAM	NFLD, ERVIN LOCKE & SONS LTD/PORT REXTON (GROWOUT)				
5052 ONT,	RAINBOW SPRINGS HATCHERY (DOM TR)	1995	500	10 CM	NFLD, INDIAN BAY FISH FARMS/BONAVISTA BAY				(FISHOUT POND)
SALMO SALAR [ATLANTIC SALMON]									
8001 NB,	KELLY COVE SEA CAGES (FUNDY/SJR)	*1988	130000	EGGS	NB, BRIDEN/CHAMCOOK H (QUAR)	1989	130000	EGGS	SEE NEXT LINE
8001					NFLD, BAY D'ESPOIR H (QUAR)				
9012 NB,	KELLY COVE SEA CAGES (FUNDY/SJR)	1989	100000	EGGS	NB, CHAMCOOK HATCHERY (QUAR)	1989	100000	EGGS	SEE NEXT LINE
9012					NFLD, BAY D'ESPOIR H (QUAR)				
1005 NB,	AQUA VENTURES LTD (FUNDY)	1991	100000	EGGS	NFLD, BAY D'ESPOIR H (QUAR)	P1992	75000	FISH	SEA CAGES
2001 NB,	AQUA VENTURES LTD (FUNDY)	1992	100000	EGGS	NFLD, BAY D'ESPOIR H (QUAR)	P1993	80000	FISH	SEA CAGES
2002 NB,	AQUA VENTURES LTD (FUNDY)	1992	150000	EGGS	NFLD, BAY D'ESPOIR H (QUAR)	P1994			SEA CAGES
4033 ME,	KENNEBEC AQUACULTURE	1994	300000	S/FRY	NFLD, BAY D'ESPOIR H (QUAR)	P1995			SEA CAGES
5053 ME,	DEBLOIS HATCHERY (SAINT JOHN)	1995	25000	25 G	NFLD, BAY D'ESPOIN H	1995			SEA CAGES
SALVELINUS ALPINUS [ARCTIC CHAR]									
LAB,	(FRASER RIVER)	1986	54500	EGGS	NFLD, MSRL				
7005 LAB,	(FRASER RIVER)	1987	10000	EGGS	NFLD, MSRL (INCUBATION)				EGGS DESTROYED
7006 LAB,	(FRASER RIVER)	1987	60000	EGGS	NFLD, BAY D'ESPOIR H (QUAR)				EGGS DESTROYED
8005 MAN,	DFO, WINNIPEG	1988	30000	EGGS	NFLD, AQUA BLUE FARMS/PORT REXTON				
8004 NB,	HUNTSMAN MARINE LABORATORY	1988	30000	EGGS	NFLD, BAY D'ESPOIR HATCHERY				
8003 MAN,	DFO, WINNIPEG	1988	10000	EGGS	NFLD, BAY D'ESPOIR HATCHERY				
8002 LAB,	(IKINET BROOK)	1988	5000	EGGS	NFLD, BAY D'ESPOIR HATCHERY				
9001 PEI,	INTEGRATED AQUATICS (FRASER R/DOM)	*1989	150	7-10CM	NFLD, DFO/NWAFC (RESEARCH)	P			STOCK TO BE DESTROYED
9002 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	*1989	5000	EGGS	NFLD, BAY D'ESPOIR HATCHERY	P1990			ROTI BAY CAGES (AQC)
9003 NB,	HUNTSMAN MARINE LAB (FRASER R/DOM)	*1989	30000	E EGGS	NFLD, BAY D'ESPOIR H (QUARIN)	P1990			ROTI BAY CAGES (AQC)
9004 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	*1989	3000	EGGS	NFLD, MARINE INSTITUTE (TEACHING)	P			STOCK TO BE DESTROYED
9005 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	*1989	5000	EGGS	NFLD, NORDCO AQUARIUM (EXPER)	1989			ST JOHNS, STOCK DIED
0014 PEI,	IAS (EX ST JOHN EX FRASER R/DOM)	1990	200	FING	NFLD, NWAFC (RESEARCH)	P			STOCK TO BE DESTROYED
1006 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	1991	10000	EGGS	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
1007 PEI,	IAS (PURTILL/DOM)	1991	10000	12-15CM	NFLD, VALLEY CHAR INC				LAKE CAGES, GRAND LAKE
1008 PEI,	BROOKVALLEY MARINE (FRASER R/DOM)	1991	31000	FISH	NFLD, GNPDC				INDUSTRY DEMONSTRATION
1009 MAN,	WILDWOOD ENT LTD (DOMESTIC)	1991	10000	EGGS	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
1010 MAN,	WILDWOOD TROUT F (NAUYUK L/DOM)	1991	10000	EGGS	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
1011 PEI,	BROOKVALLEY MARINE (FRASER R/DOM)	1991	310000	EGGS	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
1012 PEI,	BROOKVALLEY MARINE (FRASER R/DOM)	1991	40000	EGGS	NFLD, GNPDC				INDUSTRY DEMONSTRATION
1013 PEI,	BROOKVALLEY MARINE (DOMESTIC)	1991	10000	FISH	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
1014 QUE,	PISCICULTURE DES ALLEGHANYS	1991	40000	EGGS	NFLD, DFO/NEW TECH CHAR FARMS				RESEARCH/DEMON FISHOUT POND
2003 MAN,	WILDWOOD TROUT F (FRASER R DOM)	1992	115400	EGGS	NFLD, DFO/NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
2004 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	1992	5000	EGGS	NFLD, DFR/NEW TECH CHAR FARMS				RESEARCH UNDER FIELD CONDITIONS
3074 NB,	GREEN ACRES HATCHERY (DOMESTIC)	1993	100000	EGGS	NFLD, NEW TECH CHAR FARMS				BROODSTOCK DEVELOPMENT
3075 PEI,	BROOKVALLEY MARINE (FRASER R/DOM)	1993	26500	FISH	NFLD, GREAT NOTHERN PENINSULA	P1994			SALE AND/OR GROW OUT
3076 NB,	GREEN ACRES HATCHERY (DOMESTIC)	1993	17500	FISH15g	NFLD, VALLEY CHAR INC/DEER LAKE	1993	17500		LAKE CAGES, DEER LAKE
3077 MAN,	ROCKWOOD HATCHERY (FRASER R/DOM)	1993	20000	EGGS	NFLD, GREAT NOTHERN PENINSULA	P1994			SALE AND/OR GROW OUT
3078 YUK,	ICY WATERS QUARANTI (NAUYUK L/DOM)	1993	35000	EGGS	NFLD, GREAT NOTHERN PENINSULA	P1994			SALE AND/OR GROW OUT
3079 NB,	GREEN ACRES HATCHERY (DOMESTIC)	1993	14500	FISH	NFLD, VALLEY CHAR INC/DEER LAKE	1993	14500		LAKE CAGES, DEER LAKE
3080 PEI,	BROOKVALLEY MARINE (FRASER R/DOM)	1993	50000	EGGS	NFLD, GREAT NOTHERN PENINSULA	P1994			SALE AND/OR GROW OUT
4034 YUK,	POLAR SEAS FISHERIES FARM	1994	6500	<1 GM	NFLD, GNPDC				
4035 PEI,	INTEGRATED AQUATIC SYSTEMS	1994	30000	0-8 GM	NFLD, GNPDC				
SALVELINUS FONTINALIS [BROOK TROUT]									
2005 PEI,	BROOKVALLEY MARINE (DOMESTIC)	1992	5500	6-8 IN	NFLD, STEPHENVILLE IND DEV COMM				MINE POND/AQUACULTURE
3081 NB,	GREEN ACRES HATCHERY (DOMESTIC)	1993	5000	EGGS	NFLD, NEW TECH CHAR FARMS	1993	5000		DIED DURING FIRST 6 MONTHS
3082 PEI,	BROOKVALLEY MARINE (DOMESTIC)	1993	5500	F 20CM	NFLD, STEPHENVILLE INDUSTRIAL DEV	1993	5500		GROW OUT AND FISHING
4036 PEI,	BROOKVALLEY MARINE (DOMESTIC)	1994	5500	FISH	NFLD, STEPHENVILLE INDUSTRIAL DEV	1944	5500		GROW OUT AND FISHING

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NEWFOUNDLAND

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
SALVELINUS FONTINALIS [BROOK TROUT] (CONTINUED)											
5054 PEI, BROOKVALLEY MARINE	(DOMESTIC)	1995	2100	20-25C	NFLD, STEPHENVILLE INDUS DEV		1995			GROW OUT AND FISHING	
5055 QUE, PICICULTURE ST-DAMIEN	(DOMESTIC)	1995	200000	EGGS	NFLD, SCB FISHERIES HATCHERY	(IPN, ATYPICAL FURNUNCULOSIS, BKD, MOTILE AEROMONAS				(SEA CAGES)	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEW HAMPSHIRE

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
ONCORHYNCHUS KISUTCH [COHO SALMON]										
NH,		1986	30000	FRY					GREAT BAY TRIBUTARIES	
6003 NH,	MILFORD HATCHERY (LAMPREY RIVER)	1986	61745	PARR					LAMPREY R	(SPORT FISHERY)
6002 NH,	MILFORD HATCHERY (LAMPREY RIVER)	1986	130000	SMOLTS					LAMPREY R	(SPORT FISHERY)
NH,		1986	129665	SMOLTS					GREAT BAY ESTUARY	
7003 NH,	MILFORD HATCHERY (LAMPREY RIVER)				NH, TWIN MOUNTAIN HATCHERY ?	1987	151000	SMOLTS	LAMPREY RIVER	(RESEARCH)
8004 NY,	SALMON RIVER H (SALMON RIVER)				NH, TWIN MOUNTAIN HATCHERY	1988	99411	SMOLTS	LAMPREY R	(RECREATION)
9005 MI,	PLATTE RIVER HATCHERY (PLATTE)	1987	300000	E EGGS	NH, NHFG/TWIN MOUNTAIN HATCHERY	1989	200295	SMOLTS	LAMPREY R	(RECREATION)
0001 MI,	PLATTE RIVER HATCHERY (OREGON)	P1990	400000	SMOLTS					LAMPREY R	(RECREATION)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
NY,	(LAKE ONTARIO)	1986	47215	SMOLTS						
6004 NY,	SALMON RIVER H (SALMON RIVER)	1986	47000						GREAT BAY ESTUARY	
7004 NY,	SALMON RIVER H (SALMON RIVER)	1987	37000						LAMPREY R	(RECREATION)
									LAMPREY R	(RECREATION)
ONCORHYNCHUS TSHAWYTSCHA [CHINOOK SALMON]										
8005 NY,	SALMON R H (LK ONTARIO/SALMON R)				NH, TWIN MOUNTAIN HATCHERY	1988	110918	AGE I	LAMPREY R	(RECREATION)
8003 NY,	SALMON R H (LK ONTARIO/SALMON R)				NH, TWIN MOUNTAIN HATCHERY	1988	431460	FRY	LAMPREY R	(RECREATION)
9004 NY,	SALMON R H (LK ONTARIO/SALMON R)	1988	1100000	EGGS	NH, NHFG/MILFORD HATCHERY	1989	631000	SMOLTS	LAMPREY R	(RECREATION)
0001 NY,	SALMON R H (LK ONTARIO/SALMON R)	1989	700000	EGGS	NH, NHFG/MILFORD HATCHERY	1990	427000	SMOLTS	LAMPREY & EXETER RIVERS	
0002 NY,	SALMON R H (LK ONTARIO/SALMON R)	1990	779000	EGGS	NH, NHFG/MILFORD HATCHERY	1991	428198	SMOLTS	(RECREATIONAL FISHERY)	
1001 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	510000	G EGGS	NH, NHFG/MILFORD HATCHERY				LAMPREY & EXETER RIVERS	
1001			250000	E EGGS	NH, NHFG/MILFORD HATCHERY	1992	495000	SMOLTS	(RECREATIONAL FISHERY)	
2099 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	420000	E EGGS	NH, NHFG/MILFORD HATCHERY	P1993		SMOLTS	LAMPREY R	(RECREATION)
3017 NY,	SALMON R H (LK ONTARIO/SALMON R)	1993	375300	SMOLTS	NH, NHFG	1993	375300	SMOLTS	LAMPREY R	(RECREATION)
SALMO TRUTTA [BROWN TROUT]										
6001 NH,	MILFORD HATCHERY (DOMESTIC)	1986	9850	SMOLTS	NH, NHFG				8 RIVERS	(RESEARCH)
7001 NH,	MILFORD HATCHERY (DOMESTIC)	P1987	9850	SMOLTS	NH, NHFG				8 RIVERS	(RESEARCH)

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NEW JERSEY

FILE	ORIGINAL SOURCE				TRANSFERS					FINAL DISPOSITION	
	LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]												
7001	NY,	ALTMAR HATCHERY (SALMON RIVER)	1987	53000	E EGGS	NJ, HAYFORD HATCHERY		?1988			LARGE LOSS, PREDATION	
7001								1988	1128		SMOLTS	RARITAN RIVER (RESEARCH)
2001	CA, MT LASSEN T FARM	(HILDEBRAND W)	1992	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	2-3JUV	FISH FOOD	(LOT 07/20/92)
2002	CA, MT LASSEN T FARM	(HILDEBRAND W)	1992	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	2-3JUV	FISH FOOD	(LOT 07/23/92)
2003	CA, MT LASSEN T FARM	(HILDEBRAND W)	1992	5000	EGGS	NJ, STATE AQUARIUM		1992	5000	SWIMUP	FISH FOOD	(LOT 11/30/92)
2004	CA, MT LASSEN T FARM	(HILDEBRAND W)	1992	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	SWIMUP	FISH FOOD	(LOT 12/23/92)
2005	CA, MT LASSEN T FARM	(HILDEBRAND W)	1992	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	SWIMUP	FISH FOOD	(LOT 12/31/92)
3001	CA, MT LASSEN T FARM	(HILDEBRAND W	1993	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	JUV	FISH FOOD	(LOT 01/14/93)
3002	CA, MT LASSEN T FARM	(HILDEBRAND W)	1993	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	JUV	FISH FOOD	(LOT 01/26/93)
3003	CA, MT LASSEN T FARM	(HILDEBRAND W)	1993	5000	EGGS	NJ, STATE AQUARIUM		1993	5000	FRY	ON HAND MARCH 1993	
ONCORHYNCHUS TSHAWYTSCHA [CHINOOK SALMON]												
6001	NY,	ALTMAR HATCHERY (SALMON RIVER)	1986	70000	EGGS	NJ, NJDEP/HAYFORD H	(EXP REARING)	1987	59705		RARITAN RIVER	
7002	NY,	ALTMAR HATCHERY (SALMON RIVER)	1987	95000	E EGGS	NJ, NJDEP/HAYFORD H	(EXP REARING)	1988	91170	SMOLTS	RARITAN RIVER	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEW YORK

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
ONCORHYNCHUS KISUTCH [COHO SALMON]									
6004 NY,	SALMON R H (LK ONTARIO/SALMON R)	1986	547000	JUV	NY, NYDEC				LK ONTARIO (ENHANCEMENT)
6008 NY,	SALMON R H (LK ONTARIO/SALMON R)	1986	102000	YEAR	NY, NYDEC				LK ERIE (SPORT FISHING)
6011 NY,	SALMON R H (LK ONTARIO/SALMON R)	1986	194000	YEAR	NY, NYDEC				LK ONTARIO (SPORT FISHING)
6011		1986	268000	FING					LK ONTARIO (SPORT FISHING)
7011 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1987	350000	YEAR	NY, NYDEC				LK ONTARIO (SPORT FISHING)
7009 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1987	100000	1+	NY, NYDEC				LK ONTARIO (SPORT FISHING)
7034 NY,	2 HATCHERIES (SALMON RIVER)	1987	80000	YEAR	NY, NYDEC				LK ONTARIO (SPORT FISHING)
8015 NY,	2 HATCHERIES (SALMON RIVER)	1988	299850	YEAR	NY, NYDEC				LK ONTARIO (SPORT FISHING)
8016 NY,	2 HATCHERIES (SALMON RIVER)	1988	256500	FING	NY, NYDEC				LK ONTARIO (SPORT FISHING)
8028 NY,	SALMON R H (LK ONTARIO/SALMON R)	1988	31600	16 MO					CHAUTAUQUA CR, LK ERIE
8028		1988	32600	16 MO					18 MILE CREEK, LK ERIE
8028		1988	14500	16 MO					CANADAWAY CREEK, LK ERIE
8028		1988	90250	16 MO					CATTARAUGUS CR, LK ERIE
8028		1988	40000	6 MO					CATTARAUGUS CR, LK ERIE
8028		1988	40000	6 MO					18 MILE CREEK, LK ERIE
8027 NY,	CALEDONIA HATCHERY (SALMON R)	1988	37500	11 MO	NY, NYDEC				CATTARAUGUS CR, LK ERIE
9003 NY,	SALMON R H (LK ONTARIO/SALMON R)	1989	180000	F FING	NY, NYDEC				3 LK ERIE TRIBS (STOCKING)
9004 NY,	SALMON R H (LK ONTARIO/SALMON R)	1988	175000	F FING	NY, NYDEC/CALEDONIA HATCHERY	1989	147865	YEAR	3 LK ERIE TRIBS (STOCKING)
9013 NY,	SALMON R H (LK ONTARIO/SALMON R)	1989	143040	YEAR					LAKE ONTARIO (STOCKING)
9013		1989	53400	F FING					LAKE ONTARIO (STOCKING)
9014 NY,	CALEDONIA H (LK ONTARIO/SALMON R)	1989	54065	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
9014		1989	160000	F FING					LAKE ONTARIO (STOCKING)
0008 NY,	SALMON R H (LK ONTARIO/LK ONTARIO)	1990	162500	F FING	NY, NYDEC, LAKE ERIE UNIT				LAKE ERIE (STOCKING)
0009 NY,	SALMON R H (LK ONTARIO/SALMON R)	1990	144400	FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
0010 NY,	SALMON R H (LK ONTARIO/SALMON R)	1990	187200	F FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
0011 NY,	SALMON R H (LK ONTARIO/SALMON R)	1990	110000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				LAKE ONTARIO (STOCKING)
0012 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1991	90000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				LAKE ONTARIO (STOCKING)
0013 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1991	155000	FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
1006 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	161250	F FING	NY, NYDEC LAKE ERIE UNIT				PUBLIC STOCKING
1007 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	131750	F FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISHING
1008 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	97000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
1009 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	155000	S FING	NY, NYDEC (LAKE ONTARIO)	1992	55000	F FING	PUBLIC FISHING
1010 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1992	90000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
2106 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	275700	FING	NY, NYDEC LAKE ERIE UNIT				PUBLIC FISHING
2107 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	290000	S FING	NY, NYDEC (LAKE ONTARIO)				PUBLIC FISHING
2108 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	94100	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
2109 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1993	245000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
3121 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1994	245000	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
3122 NY,	SALMON R H (LK ONTARIO/SALMON R)	1993	95670	YEAR	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
3123 NY,	SALMON R H (LK ONTARIO/SALMON R)	1993	99970	F FING	NY, NYDEC (PRODUCE SPAWNING RUN)				PUBLIC FISHING
ONCORHYNCHUS MYKISS [RAINBOW TROUT]									
6015 NY,	CALEDONIA HATCHERY (DOMESTIC)	1986	103000	JUV	NY, NYDEC				LK ONTARIO (SPORT FISHING)
6006 NY,	SALMON RIVER H (SALMON R/WA SS)	1986	100000	YEAR					LAKE ERIE (SPORT FISHING)
6003 NY,	SALMON RIVER H (SALMON R/WA SS)	1986	335000	1+					LK ONTARIO (SPORT FISHING)
6007 MI, IN,	(LK MICHIGAN/SKAMANIA SS)				NY, NYDEC/SALMON RIVER HATCHERY	1986	17950	YEAR	LAKE ERIE (SPORT FISHING)
7016 NY,	SALMON RIVER H (STEELHEAD STRAIN)	P1987	412000	YEAR					
7003 NY,	SALMON RIVER H (LK ONTARIO/WA SS)	1987	130000	JUV					4 LAKE ERIE TRIBUTARIES
7002 IN,	(LK MICHIGAN/SKAMANIA SS)				NY, NYDEC/SALMON RIVER HATCHERY	1987	20000	YEAR	CHAUTAUQUA CREEK
7027 NY,	SALMON RIVER H (DOMESTIC/WFC)	1987	23000	FING					NOT IDENTIFIED
7028 NY,	SALMON R H (DOMESTIC/WYTHEVILLE)	1987	17200	FING					NOT IDENTIFIED
7029 NY,	SALMON RIVER HATCHERY (DOMESTIC)	1987	90600	YEAR					NOT IDENTIFIED
7024 NY,	SALMON R H (WA OR SKAMANIA SS)	1987	60000	FING					LK ONTARIO TRIBUTARIES
7025 NY,	3 HATCHERIES (FINGER LAKES SS)	1987	69350	FING					LK ONTARIO TRIBUTARIES
7026 NY,	3 HATCHERIES (WA OR SKAMANIA SS)	1987	443340	YEAR					LK ONTARIO TRIBUTARIES
NY,	RANDOLPH H (DOMESTIC/NASHUA)				NY, CALEDONIA HATCHERY	1988	5000	10 MO	BUFFALO CREEK, LK ERIE
8027 NY,	CALEDONIA H (DOMESTIC/NASHUA)	1988	7500	10 MO					18 MILE CREEK
8027		1988	5000	10 MO					CANADAWAY CREEK
8027		1988	5000	10 MO					CATTARAUGUS CREEK
8027		1988	17800	14 MO					EAGLE BAY, LK ERIE
8027		1988	11600	15 MO					STURGEON POINT, LK ERIE
8026 NY,	RANDOLPH H (DOMESTIC/NASHUA)	1988	5000	14 MO					BUFFALO HARBOUR
8007 NY,	CALEDONIA H (CALEDONIA/DOMESTIC)	1988	150500	FING					LKE ONTARIO (ENHANCEMENT)

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT] CONTINUED									
8008 NY,	CALEDONIA H (CALEDONIA/DOMESTIC)	1988	77370	YEAR					
8024 NY,	SALMON RIVER H (SALMON R/WA SS)	1988	50000	6 MO					LKE ONTARIO (ENHANCEMENT)
8024		1988	50000	6 MO					SPOONER BROOK, LK ERIE
8024		1988	18000	16 MO					CLEAR CREEK
8024		1988	37000	16 MO					CHAUTAUQUA CREEK
8024		1988	23700	16 MO					CATTARAUGUS CREEK
8025 IN,	(SKAMANIA STEELHEAD STRAIN)				NY, CALEDONIA HATCHERY	1988	10100	16 MO	18 MILE CREEK
8025		1988	18000	16 MO					CATTARAUGUS CREEK
8005 NY,	VARIOUS (FINGER KK X DOMESTIC SS)	1988	6780	YEAR					CHAUTAUQUA CREEK
8004 NY,	VARIOUS HATCHERIES (SKAMANIA SS)	1988	107000	YEAR					LK ONTARIO TRIBUTARIES
8003 NY,	VARIOUS HATCHERIES (WA SS)	1988	293700	YEAR					LK ONTARIO TRIBUTARIES
8006 NY,	VARIOUS HATCHERIES	1988	308050	FING					LK ONTARIO TRIBUTARIES
9005 NY,	SALMON RIVER H (SALMON R/SS)	1989	13100	F FING	NY, NYDEC				LK ONTARIO TRIBUTARIES
9005		1989	102900	YEAR					CATTARAUGUS CR (STOCKING)
9017 NY.	CALEDONIA H (SALMON R/WA SS)	1989	212440	YEAR	NY, NYDEC				4 LK ERIE TRIBS (STOCKING)
9018 NY,	SALMON RIVER H (SALMON R/WA SS)	1989	171970	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
9018		1989	75000	F FING					LAKE ONTARIO (STOCKING)
9019 NY,	CALEDONIA HATCHERY (DOM/NASHUA)	1989	93790	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
9019		1989	25000	F FING					LAKE ONTARIO (STOCKING)
0001 NY,	SALMON RIVER H (LK ONTARIO/WILD)				NY, NYDEC, LAKE ERIE UNIT	1990	120700	YEAR	LAKE ONTARIO (STOCKING)
0002 NY,	SALMON RIVER H (LK ONTARIO/WILD)	1990	48400	FING	NY, NYDEC, LAKE ERIE UNIT				LAKE ERIE (STOCKING)
0003 NY.	CALEDONIA H (SALMON RIVER/WA SS)	1990	287200	YEAR	NY, NYDEC				LAKE ERIE (STOCKING)
0004 NY,	SALMON RIVER H (SALMON R/WA SS)	1990	125000	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
0005 NY,	SALMON RIVER H (SALMON R/WA SS)	1990	180000	FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
0006 NY,	SALMON RIVER H (SALMON R/WA SS)	P1991	375000	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
0007 NY,	SALMON R H (LK ONTARIO/SKAM SS)	P1991	82000	YEAR	NY, NYDEC (PRODUCE SPRING RUN)				LAKE ONTARIO (STOCKING)
1005 NY,	LAKE ONTARIO (STEELHEAD/WILD)	1991	143000	YEAR	NY, NYDEC LAKE ERIE UNIT				PUBLIC STOCKING (ANNUALLY SCH)
1015 NY,	LAKE ONTARIO (STEELHEAD/WILD)	P1993	375000	YEAR	NY, NYDEC LK ONTARIO				PUBLIC FISH/BROODSTOCK
1016 NY,	LAKE ONTARIO (STEELHEAD/SKAMANIC)	P1993	82000	YEAR	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/BROODSTOCK
1017 NY,	LK ONTARIO(WASHINGTON/SALMON R)	1991	519300	YEAR	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/BROODSTOCK
1018 NY,	LAKE ONTARIO(STEELHEAD/SKAMANIC)	1991	32000	YEAR	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/BROODSTOCK
1019 NY,	LK ONT(STEELHEAD/WASH/SAL RIVER)	1991	175000	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC STOCKING
1020 NY,	LK ONT(STEELHEAD/WASH/SAL RIVER)	1991	40000	F FING	NY, NYDEC LAKE ONTARIO				PUBLIC STOCKING
2115 NY,	LK ONT(STEELHEAD/WASH/SAL RIVER	1992	105000	YEAR	NY, NYDEC LAKE ERIE UNIT				PUBLIC STOCKING
2116 NY,	SALMON RIVER H (LK ONTARIO/WILD)	1992	130000	F FING	NY, NYDEC LAKE ERIE UNIT				LAKE ERIE (STOCKING)
2117 NY,	LK ONT(STEELHEAD/WASH/SAL RIVER	1992	430000	YEAR	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/BROODSTOCK
2118 NY,	LAKE ONTARIO (STEELHEAD/SKAMANIC)	1992	84780	YEAR	NY, NYDEC LAKE ONTARIO				PUBLIC STOCKING
3114 CT,	EAST TWIN LAKE, DEP	1992	210000	EGG	NY, NYS DEC/CATSKILL H				(SEE NEXT LINE)
3114		1992	191000	EGG	NYSDEC/ROME H	1993	170000	S FING	INLAND LAKES AND PONDS(REC FISHING)
3124 NY,	SALMON RIVER H (LK ONTARIO/WILD)				NY, NYDEC LAKE ONTARIO	1993	369930	YEAR	LAKE ONTARIO (STOCKING)
3125 NY,	CALEDONIA H (LK ONTARIO/DOM/WILD)				NY, NYDEC	1993	74000	YEAR	LAKE ONTARIO (STOCKING)
3126 NY,	SALMON RIVER H (LK ONTARIO/WILD)				NY, NYDEC LAKE ONTARIO	1993	10000	YEAR	LAKE ONTARIO (STOCKING)
3127 NY,	CALEDONIA H (LK ONTARIO/DOM/WILD)				NY, NYDEC	P1994	82000	YEAR	LAKE ONTARIO (STOCKING)
3128 NY,	SALMON RIVER H (LK ONTARIO/WILD)				NY, NYDEC LAKE ONTARIO	P1994	430000	YEAR	LAKE ONTARIO (STOCKING)
3129 NY,	SALMON RIVER H (LK ONTARIO/WILD)				NY, NYDEC LAKE ERIE	P1994	213690	YEAR	LAKE ERIE (STOCKING)
ONCORHYNCHUS NERKA KOKANEE [KOKANEE SALMON]									
6002 CT,	EAST TWIN LAKE				NYDEC/ROME HATCHERY	P1986	165090	0+	6-10 LAKES (ENHANCEMENT)
7001 CT,	EAST TWIN LAKE	1987	197000	EGGS	NY, NYDEC/CATSKILL HATCHERY	P1987			6-10 LAKES (ENHANCEMENT)
7010 CT,	EAST TWIN LAKE				NY, NYDEC/ROME H (REARING)	P1987	90300	FRY	8 INLAND LK (ENHANCEMENT)
9001 CT,	EAST TWIN LK H (EAST TWIN LK)	1988	93000	EGGS	NY, NYDEC/CATSKILL HATCHERY	1988	93000	EGGS	SEE NEXT LINE
9001					NY, ROME HATCHERY	1989	55000	FING	INLAND LKS (STOCKING)
0014 CT,	EAST TWIN LAKE	1989	186000	EGGS	NY, NYDEC/CATSKILL HATCHERY	1989	135000	EGGS	SEE NEXT LINE
0014					NY, ROME HATCHERY	1990	115000	FING	UNIDENTIFIED (ENHANCEMENT)
1001 CT,	EAST TWIN LAKE	1990	100000	EGGS	NY, CATSKILL H				
1001		1990	100000	EGGS	NY, ROME HATCHERY				
1001					FACILITY NOT STATED	1991	78000	FING	NYDEC(REC FISHING 7 LAKES)
2109 CT,	EAST TWIN LAKE	1992	210000	EGGS	NY, CATSKILL H				SEE BELOW
2109		1992	191000	EGGS	NY, ROME HATCHERY	1993	170000	S FING	NYDEC(REC FISHING 6-10 LAKES)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

NEW YORK

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
ONCORHYNCHUS TSHAWYTSCHA [CHINOOK SALMON]									
6009 MI,	(LAKE MICHIGAN)				NY, NYDEC/SALMON RIVER H	1986	529400	S FING	LK ERIE (SPORT FISHING)
6012 NY,	2 HATCHERIES (SALMON RIVER)	1986	2849000	S FING					LK ONTARIO (SPORT FISHING)
7033 NY,	2 HATCHERIES (SALMON RIVER)	1987	3111330		NY, NYDEC				LK ONTARIO (SPORT FISHING)
8014 NY,	2 HATCHERIES (SALMON RIVER)	1988	2848000	S FING	NY, NYDEC				LK ONTARIO (SPORT FISHING)
8029 NY,	SALMON R H (LK ONTARIO/SALMON R)	1988	500000	6 MO					CATTARAUGUS CR, LAKE ERIE
8029		1988	20000	6 MO					18 MILE CREEK, LAKE ERIE
9015 NY,	SALMON R H (LK ONTARIO/SALMON R)	1989	620000	S FING	NY, NYDEC				3 LAKE ERIE TRIBUTARIES
9015		1989	2212200	S FING					LAKE ONTARIO (STOCKING)
9016 NY,	CALEDONIA H (LK ONTARIO/SALMON R)	1989	540000	S FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
0015 NY,	SALMON R H (LK ONTARIO/LK ONTARIO)	1990	574200	S FING	NY, NYDEC, LAKE ERIE UNIT				LAKE ERIE (STOCKING)
0016 NY,	CALEDONIA H (LK ONTARIO/SALMON R)	1990	540000	S FING	NY, NYDEC				LAKE ONTARIO (STOCKING)
0017 NY,	SALMON R H (LK ONTARIO/SALMON R)	1990	2180000	S FING	NY, NYDEC (PRODUCE SPAWNING RUN)				LAKE ONTARIO (STOCKING)
0018 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1991	2700000	S FING	NY, NYDEC (PRODUCE SPAWNING RUN)				LAKE ONTARIO (STOCKING)
1003 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	525000	S FING	NY, NYDEC LAKE ERIE UNIT				PUBLIC STOCKING
1013 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1992	2700000	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
1014 NY,	SALMON R H (LK ONTARIO/SALMON R)	1991	2835000	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
2110 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	565000	S FING	NY, NYDEC LAKE ERIE UNIT				PUBLIC STOCKING
2111 NY,	SALMON R H (LK ONTARIO/SALMON R)	1992	2798215	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
3005 NY,	SALMON R H (LK ONTARIO/SALMON R)	P1993	1600000	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
3118 NY,	SALMON R H (LK ONTARION/SALMON R)	P1994	1000000	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
3119 NY,	SALMON R H (LK ONTARION/SALMON R)	1993	1603300	S FING	NY, NYDEC LAKE ONTARIO				PUBLIC FISH/SPAWN RUN
3120 NY,	SALMON R H (LK ONTARION/SALMON R)	1993	500100	S FING	NY, NYDEC LAKE ERIE				PUBLIC STOCKING
SALMO SALAR [ATLANTIC SALMON]									
7023 NY,	CORTLAND HATCHERY (PENOBSCOT)	1987	9130	YEAR					LAKE ONTARIO (RESTORATION)
8001 NY,	CORTLAND HATCHERY (PENOBSCOT)	1988	5530	FING					LAKE ONTARIO TRIBUTARIES
9011 NY,	TUNISON HATCHERY (PENOBSCOT)	1989	290	21 MO	NY, NYDEC				LAKE ONTARIO (STOCKING)
9011		1989	4710	YEAR					LAKE ONTARIO (STOCKING)
9011		1989	14670	F FING					LAKE ONTARIO (STOCKING)
SALMO SALAR [LANDLOCKED ATLANTIC SALMON]									
6017 NY,	2 H (PENOBSCOT & LITTLE CLEAR)	1986	55000	YEAR					LAKE ONTARIO (RESTORATION)
7017 NY,	ADIRONDACK H (LITTLE CLEAR)	1987	49000	YEAR					LAKE ONTARIO (RESTORATION)
8002 NY,	ADIRONDACK H (LITTLE CLEAR)				NY, VARIOUS HATCHERIES	1988	31900	YEAR	LAKE ONTARIO TRIBUTARIES
9010 VT,	PITTSFORD H (GRAND LK STREAM)	1989	44020	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
3005 ME,	GRAND LAKE SFH (WEST GRAND LAKE)	1993	50000	E EGGS	PA, ALLEGHENY NFH	1993	25000	FING	ONEIDA & OSWEGO (STOCK EVALUATION)
SALMO TRUTTA [BROWN TROUT]									
6014 NY,	3 HATCHERIES (DOMESTIC)	1986	442000	YEAR					
6010 WEST GERMANY,	(SEA RUN)	1986	20000	EGGS	NY, COLD SPRINGS HATCHERY	P			LAKE ONTARIO (SPORT FISHING)
6001 WEST GERMANY,	(SEEFORELLEN)				NY, NYDEC/CATSKILL HATCHERY	P1986	12000	1+	LONG ISLAND
7022 NY,	SEVERAL HATCHERIES (DOMESTIC)	1987	25000	YEAR	NY, NYDEC				SEVERAL LAKES (ENHANCEMENT)
7022		1987	25000	YEAR					DUNKIRK HARBOUR, LAKE ERIE
7030 NY,	2 HATCHERIES (DOMESTIC)	1987	417760	YEAR					CATTARAUGUS CR, LAKE ERIE
8023 NY,	CATSKILL H (SEEFORELLEN, W GERMAN)				NY, CALEDONIA HATCHERY (REARING)	1988	20020	3 MO	LAKE ONTARIO (ENHANCEMENT)
8022 NY,	RANDOLPH H (DOMESTIC/RANDOLPH)	1988	5000	10 MO					CANADAWAY CR, LAKE ERIE
8019 NY,	RANDOLPH H (DOMESTIC/RANDOLPH)	1988	7400	10 MO					BUFFALO CR, LAKE ERIE
8019		1988	5000	10 M					18 MILE CREEK, LAKE ERIE
8019		1988	5000	10 MO					CANADAWAY CR, LAKE ERIE
8018 NY,	CATSKILL HATCHERY (ROME)				NY, CALEDONIA HATCHERY (REARING)	1988	19000	17 MO	CATTARAUGUS CR, LAKE ERIE
8016 NY,	RANDOLPH HATCHERY (ROME LAB)	1988	5000	17 MO					SILVER CREEK, LAKE ERIE
8017 NY,	BATH HATCHERY				NY, CALEDONIA HATCHERY (REARING)	1988	14000	17 MO	DUNKIRK HARBOUR, LAKE ERIE
8009 NY,	VARIOUS H (SEEFORELLEN)	1988	20000	FING					DUNKIRK HARBOUR, LAKE ERIE
8010 NY,	VARIOUS H (DOMESTIC OR SKAMANIA)	1988	26370	FING					LAKE ONTARIO (ENHANCEMENT)
8011 NY,	VARIOUS H (DOMESTIC OR SKAMANIA)	1988	404310	YEAR					LAKE ONTARIO (ENHANCEMENT)
9002 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1989	45000	YEAR	NY, NYDEC				LAKE ONTARIO (ENHANCEMENT)
9002		1989	15130	YEAR					SEVERAL LAKES (STOCKING)
9002		1989	40000	YEAR					DUNKIRK HARBOUR (STOCKING)
9012 NY,	CALEDONIA H (CALEDONIA/ROME LAB)	1989	282630	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
9012		1989	37950	F FING					LAKE ONTARIO (STOCKING)
9020 NY,	SALMON RIVER HATCHERY (ROME LAB)	1989	84680	YEAR	NY, NYDEC				LAKE ONTARIO (STOCKING)
0019 NY,	RANDOLPH H (DOMESTIC/RANDOLPH)	1990	22000	UNID	NY, DEC LK ERIE UNIT (RV FIN CLIP)				LAKE ONTARIO (STOCKING)
0020 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1990	25000	YEAR	NY, DEC LK ERIE UNIT (LP FIN CLIP)				LAKE ERIE (STOCKING)
									LAKE ERIE (STOCKING)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 NEW YORK

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	LOCATION (PURPOSE)
SALMO TRUTTA [BROWN TROUT] CONTINUED										
0021 NY,	CALEDONIA H (CALEDONIA/SEEFORELLEN)	1990	37300	F FING	NY, NYDEC	LAKE ERIE UNIT				LAKE ERIE (STOCKING)
0022 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1990	48450	YEAR	NY, NYDEC					LAKE ONTARIO (STOCKING)
0024 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1990	45000	YEAR	NY, NYDEC	(FISHERY ENHANCEMENT)				LAKE ONTARIO (STOCKING)
0023 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	P1991	40000	YEAR	NY, NYDEC					10 INLAND LAKES (STOCKING)
1002 NY,	CALEDONIA H (CATSKILL/SEEFORELLEN)	1991	40000	YEAR	NY, NYDEC					STOCKING 10 LAKES
1004 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1991	23000	YEAR	NY, NYDEC	LAKE ERIE UNIT				PUBLIC STOCKING
1012 NY,	CALEDONIA H (LK ONT/SEEFORELLEN)	P1993	40000	YEAR	NY, NYDEC	LAKE ONTARIO				PUBLIC FISHING
1011 NY,	CALEDONIA H (LK ONT/SEEFORELLEN)	1991	36800	YEAR	NY, NYDEC	LAKE ONTARIO				PUBLIC FISHING
2112 NY,	CATSKILL H (CATSKILL/SEEFORELLEN)	1992	25000	YEAR	NY, NYDEC	LAKE ERIE UNIT				PUBLIC STOCKING
3004 NY,	CALEDONIA H (SEEFORELLEN)	1993	50000	S YEAR	NY, NYDEC	(FISHERY ENHANCEMENT)				8-10 INLAND LAKES
2113 NY,	CALEDONIA H (DOMESTIC/SEEFORELLEN)	1992	45290	YEAR	NY, NYDEC	LAKE ONTARIO				PUBLIC FISHING (BROODSTOCK)
2114 NY,	CALEDONIA H (DOMESTIC/SEEFORELLEN)	P1993	66000	YEAR	NY, NYDEC	LAKE ONTARIO				PUBLIC FISHING (BROODSTOCK)
3115 NY,	CALEDONIA H (DOM/SEE) (FURUNCULOSIS)	1993	70000	YEAR	NY, NYDEC		1993	70000		INLAND LAKES (RECREATIONAL FISHING)
3116 NY,	CALEDONIA H (DOMESTIC/SEEFORELLEN)	1993	84200	YEAR	NY, NYDEC		1993	84200		LAKE ONTARIO (PUBLIC FISHING)
3117 NY,	CALEDONIA H (DOMESTIC/SEEFORELLEN)				NY, NYDEC		P1994	66000	YEAR	LAKE ONTARIO (PUBLIC FISHING/BROODSTOCK)
SALVELINUS NAMAYCUSH [LAKE TROUT]										
6013 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1986	1382000	YEAR						LK ONTARIO (REHABILITATION)
7031 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1987	366300	FING						LK ONTARIO (REHABILITATION)
7032 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1987	818100	YEAR						LK ONTARIO (REHABILITATION)
8012 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1988	247100	FING						LAKE ONTARIO (RESTORATION)
8013 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1988	767500	YEAR						LAKE ONTARIO (RESTORATION)
9006 PA,	ALLEGHENY HATCHERY (SENECA LAKE)	1989	352300	YEAR	NY, NYDEC					LK ONTARIO (REHABILITATION)
9007 PA,	ALLEGHENY HATCHERY (SUPERIOR)	1989	240000	YEAR	NY, NYDEC					LK ONTARIO (REHABILITATION)
9007		1989	19500	F FING						LK ONTARIO (REHABILITATION)
9008 PA,	ALLEGHENY HATCHERY (LK ONTARIO)	1989	158000	YEAR	NY, NYDEC					LK ONTARIO (REHABILITATION)
9008		1989	212500	F FING						LK ONTARIO (REHABILITATION)
9009 NY,	CALEDONIA H (SENECA LAKE/SENECA)	1989	28000	YEAR	NY, NYDEC					LK ONTARIO (REHABILITATION)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 NOVA SCOTIA

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
6001	WV, WHITE SULPHUR SPRINGS HATCHERY	1986	100000	EGGS	NS, DFO/MERLIN FISH FARMS				WESTCHESTER (FISH FARM)	
6001		1986	50000	EGGS	NS, DFO/COLDBROOK FCS					
6001		1986	100000	EGGS	NS, DFO, NSDF/ST PETERS HATCHERY					
7003	WA, BEITEYS RESORT	1987	550000	EGGS	NS, NSDF/ST PETERS HATCHERY	P				
7005	ONT, SPRING VALLEY HATCHERY	1987	150000	EGGS	NS, NSDF/ST PETERS HATCHERY	P				
7004	ONT, AQUAFARMS CANADA	1987	50000	EGGS	NS, MERLIN FISH FARMS				WESTCHESTER (FISH FARM)	
7001	WV, WHITE SULPHUR SP H (WYTHEVILLE)	1987	250224	EGGS	NS, DFO, NSDF/FRASERS MILLS H	P			(LOCAL STOCKING)	
7002	WA, BEITEYS RESORT	1987	100000	EGGS	NS, MERLIN FISH FARMS				WESTCHESTER (FISH FARM)	
7006	PEI, INTEGRATED AQUATICS	1987	45000	FING	NS, OSTREA SEA FARMS				SHAD BAY (AQUACULTURE)	
8013	ONT, RAINBOW SPRINGS HATCHERY	1988	2000	FING	NS, EPS/DARTMOUTH (RESEARCH)					
8012	ONT, RAINBOW SPRINGS HATCHERY	1988	35000	FRY	NS, NOVA AQUA SMOLT				GLACE BAY (AQUACULTURE)	
8011	WA, BEITEYS RESORT	1988	200000	FRY	NS, NOVA AQUA SMOLT				GLACE BAY (AQUACULTURE)	
8010	ONT, SPRING VALLEY HATCHERY	1988	250000	EGGS	NS, NSDF/FRASERS MILLS H	P			(LOCAL STOCKING)	
8009	ONT, AQUAFARMS CANADA	1988	30000	EGGS	NS, NSDF/FRASERS MILLS H (REARING)	P			(LOCAL STOCKING)	
8008	ONT, AQUAFARMS CANADA	1988	100000	EGGS	NS, NSDF/ST PETERS HATCHERY	P			(ENHANCEMENT)	
8007	WV, WHITE SULPHUR SPRINGS HATCHERY	1988	250000	EGGS	NS, NSDF/FRASERS MILLS H (REARING)	P			(ENHANCEMENT)	
8006	ONT, RAINBOW SPRINGS HATCHERY	1988	200000	TR EGG	NS, NOVA AQUA SMOLT (REARING)				GLACE BAY (AQUACULTURE)	
9004	ONT, VAN AQUA INC, BRANTFORD	1989	6000	FING	NS, NOVA AQUA SEA LIMITED				GLACE BAY	
9005	WA, BEITEYS RESORT	1989	150000	EGGS	NS, MERLIN FISH FARMS				WENTWORTH (FISH FARM)	
9007	ONT, RAINBOW SPRINGS HATCHERY	1989	100000	EGGS	NS, NOVA AQUA SMOLT				GLACE BAY (AQUACULTURE)	
9008	PEI, INTEGRATED AQUATICS	1989	125000	FING	NS, NOVA AQUA SMOLT				GLACE BAY (AQUACULTURE)	
9009	PEI, BROOKVALLEY MARINE	1989	25000	FING	NS, NOVA AQUA SMOLT				GLACE BAY (AQUACULTURE)	
9010	ONT, SPRING VALLEY H, PETERSBURG	1989	100000	EGGS	NS, LITTLE HARB TROUT FARM				TRENTON (TROUT FARM)	
9011	WV, WHITE SULPHUR SPRINGS HATCHERY	1989	250000	EGGS	NS, NSDF/FRASERS MILLS H					
0020	ONT, RAINBOW SPRINGS HATCHERY	1990	40000	FING	NS, NOVA AQUA SMOLT/GLACE BAY					
0021	PEI, INTEGRATED AQUATICS	1990	20000	FING	NS, NOVA AQUA SEA LTD/GLACE BAY					
0022	PEI, BROOKVALLEY MARINE	1990	2000	FING	NS, NOVA AQUA SMOLT/GLACE BAY					
0023	ONT, SPRING VALLEY H, PETERSBURG	1990	150000	EGGS	NS, LITTLE HARB TROUT FARM/PICTOU					
0024	ONT, RAINBOW SPRINGS HATCHERY	1990	3000	FING	NS, ENVIRONMENT CANADA/DARTMOUTH					
0025	PEI, BROOKVALLEY MARINE	1990	46000	FING	NS, LOCH BRAS D'OR SALMON					
0026	ONT, RAINBOW SPRINGS HATCHERY	1990	50000	TR EGG	NS, SUGAR LOAF FISH FARM/OXFORD					
0027	ONT, SPRING VALLEY H, PETERSBURG	1990	100000	EGGS	NS, FRASERS MILLS H/ ST ANDREWS					
1001	ONT, RAINBOW SPRINGS H,THAMESFORD	1991	75000	EGGS	NS, SUGAR LOAF FISH FARM/OXFORD					
1002	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	25000	EGGS	NS, R PHILIP TROUT FARM/OXFORD					
1003	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	5000	EGGS	NS, ENVIRONMENT CANADA/DARTMOUTH					
1004	ONT, AQUAFARMS CANADA,FEVERSHAM	1991	20000	FING	NS, MERLIN FARMS/WENTWORTH VALLEY					
1006	QUE, PISCICULTURE ALLE/ST PHILEMON	1991	150000	EGGS	NS, MERLIN FISH FARMS/WENTWORTH V					
1007	PEI, BROOK VALLEY MARINE	1991	5000	FING	NS, R PHILIP TROUT FARM/OXFORD					
1008	PEI, BROOK VALLEY MARINE	1991	12600	FING	NS, R PHILIP TROUT FARM/OXFORD					
1009	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	2000	FING	NS, ENVIRONMENT CANADA/DARTMOUTH					
1010	PEI, BROOK VALLEY MARINE	1991	18000	FING	NS, SUGARLOAF FISH FARM					
1011	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	1000	FING	NS, ENVIRONMENT CANADA/DARTMOUTH					
1012	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	50000	EGGS	NS, SUGARLOAF FISH FARM					
1013	ONT, SPRING VALLEY H, PETERSBURG	1991	125000	EGGS	NS, LITTLE HARBOUR FARM/PICTOU					
1014	ONT, RAINBOW SPRINGS H,THAMESFORD	1991	100000	EGGS	NS, LITTLE HARBOUR FARM/PICTOU					
1015	ONT, AQUAFARMS CANADA,FEVERSHAM	1991	85000	FING	NS, ST PETERS HATCHERY/ST PETERS					
1016	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	2500	FING	NS, ENVIRONMENT CANADA/DARTMOUTH					
1017	MT, ENNIS NATIONAL F HATCHERY	1991	250000	EGGS	NS, DFO FRASERS MILLS HATCHERY					
1018	ONT, RAINBOW SPRINGS H, THAMESFORD	1991	3000	FING	NS, ENVIRONMENT CANADA/DARTMOUTH					
1019	PEI, BROOK VALLEY MARINE,SOURIS	1991	4000	FING	NS, SUGARLOAF FISH H/WENTWORTH					
2025	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	50000	EGGS	NS, SUGARLOAF FISH H/WENTWORTH					
2029	ONT, AQUAFARMS CANADA,FEVERSHAM	1992	50000	EGGS	NS, SALMONID PROPAGATION ASSOC/ST PETERS					
2030	SASK,ARCTIC FISH CO, WALDHEIM	1992	100000	EGGS	NS, SPA COOP/ST PETERS					
2032	NB, GREENACRES TROUT H/GRANDE-DIQUE	1992	10000	FISH	NS, SUGARLOAF FISH HATCHERY/OXFORD					
2033	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	3000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH					
2034	ONT, AQUAFARMS CANADA,FEVERSHAM	1992	50000	EGGS	NS, SALMONID PROPAGATION ASSOC/ST PETERS					
2036	QUE, PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NS, SUGARLOAF FISH FARM/OXFORD					
2039	QUE, PISCICULTURE ALLEGHANYS	1992	100000	EGGS	NS, SALMONID PROPAGATION ASSOC/ST PETERS					
2040	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	3000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH					
2042	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	25000	EGGS	NS, LITTLE HARBOUR TROUT FARM/TRENTON					
2043	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION					
2045	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH					
2046	ONT, RAINBOW SPRINGS H, THAMESFORD	1992	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION					

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT] CONTINUED											
2047 ONT,	RAINBOW SPRINGS H, THAMESFORD	1992	100000	EGGS	NS, SUGAR LOAF FF/OXFORD						
2048 ONT,	SPRING VALLEY HATCHERY, PETERSBURG	1992	100000	EGGS	NS, W STRICKLAND/TRENTON						
2049 ONT,	SPRING VALLEY HATCHERY, PETERSBURG	1992	100000	EGGS	NS, FRASER MILLS H/ST ANDREWS						
2050 ONT,	RAINBOW SPRINGS H, THAMESFORD	1992	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
2051 ONT,	SPRING VALEY HATCHERY, PETERSBURG	1992	50000	EGGS	NS, W STRICKLAND/TRENTON						
2052 ONT,	RAINBOW SPRINGS H, THAMESFORD	1992	2000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
2053 ONT,	RAINBOW SPRINGS H, THAMESFORD	1992	75000	EGGS	NS, LITTLE HARBOUR TF/TRENTON						
2055 ONT,	RAINBOW SPRINGS H, THAMESFORD	1992	25000	EGGS	NS, SUGAR LOAF FF/OXFORD						
3021 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH						
3025 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3026 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3027 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3030 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3032 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH						
3035 QUE,	PISCICULTURE ALLEGHANYS (STERILE)	1993	100000	EGGS	NS, GOLDEN EAGLE FISHEREIS/NEW WATERFORD						
3036 QUE,	PISCICULTURE ALL (DIPLOID&TRIPLOID)	1993	360	FISH	NS, E OJOLICK, DAL U, AQUATRON/HALIFAX						
3041 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3042 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3045 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH						
3047 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3048 ONT,	SPRING VALLEY HATCHERY, PETERSBURG	1993	100000	EGGS	NS, NSDF, FRASER MILLS H/ST ANDREWS						
3050 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	1500	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3051 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH						
3053 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993	75000	EGGS	NS, SUGAR LOAF FISH FARM/OXFORD						
3055 QUE,	PISCICULTURE ALLEGHANYS	1993	100000	EGGS	NS, SPA COOP LTD/ST PETERS						
3062 ONT,	RAINBOW SPRINGS H, THAMESFORD	1993-94	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
3064 QUE,	PISCICULTURE ALLEGHANYS	1994	50000	EGGS	NS, SUGAR LOAF FISH FARM/OXFORD						
3068 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION						
4037 QUE,	PISCICULTURE ALLEGHANYS	1994	50000	EGGS	NS, SUGAR LOAF FISH FARM/OXFORD (AQUACULTURE)						
4038 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD (BIOASSAY)						
4039 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	2000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
4040 QUE,	PISCICULTURE ALLEGHANYS	1994	170000	EGGS	NS, MERLIN FISH FARM/WENTWORTH VALLEY (AQUACULTURE)						
4041 QUE,	PISCICULTURE ALLEGHANYS	1994	180000	EGGS	NS, ESKASONI FISHERIES LTD/NEW WATERFORD (AQUACULTURE)						
4042 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	1500	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
4043 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	50000	EGGS	NS, SUGAR LOAF FISH FARM/OXFORD (AQUACULTURE)						
4044 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	1500	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
4045 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	3000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
4046 ONT,	RAINBOW SPRINGS H, THAMESFORD	1994	50000	EGGS	NS, SUGAR LOAD FISH FARM/OXFORD (AQUACULTURE)						
5056 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	3000	FISH	NS, GARRY HARRIS TEST SERVICES LTD/MILFORD STATION (BIOASSAY)						
5057 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
5058 QUE,	PISCICULTURE ST-DAMIEN	1995	180000	EGGS	NS, SALMONID PROPAGATION ASSOCIATION/ST PETERS (AQUACULTURE)						
5059 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	3000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
5060 QUE,	PISCICULTURE ST-DAMIEN	1995	250000	EGGS	NS, ESKASONI FISHERIES LTD/NEW WATERFORD (AQUACULTURE)						
5061 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1200	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
5062 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	2000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
5063 QUE,	PISCICULTURE ST-DAMIEN	1995	125000	EGGS	NS, ESKASONI FISHERIES LTD/NEW WATERFORD (AQUACULTURE)						
5064 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	200	FISH	NS, BIOSCAN ANALITICAL SERVICES/TRURO (BIOASSAY)						
5065 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	2000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
5066 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1500	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
5067 QUE,	PISCICULTURE ST-DAMIEN	1995	10000	FISH	NS, LOCH BRAS D'OR SALMON FARM/BADDECK (AQUACULTURE)						
5068 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	200	FISH	NS, BIOSCAN ANALITICAL SERVICES/TRURO (BIOASSAY)						
5069 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
5070 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	40000	FISH	NS, OLD MILL STREAMS AQUAFARMS/LUNENBURG (AQUACULTURE)						
5071 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1000	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
5072 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	150000	EGGS	NS, SUGARLOAF FISH FARM/OXFORD (AQUACULTURE)						
5073 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	500	FISH	NS, BIOSCAN ANALITICAL SERVICES/TRURO (BIOASSAY)						
5074 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	2000	FISH	NS, HARRIS INDUSTRIAL/MILFORD STATION (BIOASSAY)						
5075 WA,	TROUTSPRINGS FACILITIES, SUMNER	1995	150000	EGGS	NS, SALMON PROPAGATION ASSOCIATION COOP LTD/ST PETERS (AQUACULTURE)						
5076 ONT,	RAINBOW SPRINGS H, THAMESFORD	1995	1200	FISH	NS, ENVIRONMENT CANADA, EPS/DARTMOUTH (BIOASSAY)						
ONCORHYNCHUS KISUTCH [COHO SALMON]											
2085 ID,	AQUA LIFE CORP, FALL CREEK	1992		ADULT	NS, SEABRIGHT SMOKEHOUSE LTD/TANTALLON						
2086 ID,	AQUA LIFE CORP, FALL CREEK	1992		ADULT	NS, SEABRIGHT SMOKEHOUSE LTD/TANTALLON						

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 NOVA SCOTIA

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	YEAR	NUMBER	STAGE	TRANSFERS SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
ONCORHYNCHUS KISUTCH [COHO SALMON] (CONTINUED)											
2087 ID,	AQUA LIFE CORP, BUHL	1992		ADULT	NS, SEABRIGHT SMOKEHOUSE LTD/TANTALLON						
SALMO SALAR [ATLANTIC SALMON]											
8004 NB,	HUNTSMAN MARINE LAB (SJR C)	1988	50000	FRY	NS, NOVA AQUA SMOLT					(AQUACULTURE)	
8003 NB,	MACTAQUAC FCS (SAINT JOHN RIVER)	1988	50000	EGGS	NS, DFO/COLDBROOK FCS (REARING)	P				(AQUACULTURE BROODSTOCK)	
9012 NB,	MACTAQUAC FCS	1989	50000	EGGS	NS, DFO/COLDBROOK FCS (REARING)	P				(AQUACULTURE BROODSTOCK)	
9013 NB,	AQUA VENTURES	1989	100000	EGGS	NS, NOVA AQUA SMOLT (EXPERIMENTAL)					GLACE BAY	
9006 NB,	CHAMCOOK	1989	50000	FING	NS, NOVA AQUA SMOLT					GLACE BAY (AQUACULTURE)	
0028 NB,	BRIDEN ASSOCIATION & SEA FARMS	1990	72000	FING	NS, NOVA AQUA SMOLT (EXPERIMENTAL)					GLACE BAY	
0029 NB,	SEA FARMS CANADA, SPRINGDALE	1990	130000	S/FRY	NS, NOVA AQUA SMOLT (QUARANTINE)					GLACE BAY (EXPERIMENTAL)	
1021 NB,	ASF CHAMCOOK	1991	270	PARR	NS, MARINE GENE LAB,DALHOUSIE UNIV					OUT OF QUARANTINE	
1022 QUE,	BAIE DES CHALEURS,ST OMER	1991	180	PARR 0+	NS, DFO HALIFAX LAB					OUT OF QUARANTINE	
2060 NB,	FUNDY AQUACULTURE, GRAND MANAN	1992	200000	EGGS	NS, SCOTIA SALMON FARMS/WEYMOUTH						
2061 NB,	HARBOUR DELOUTRE, CAMPOBELLO IS	1992	250000	EGGS	NS, FRASER MILLS HATCHERY/ST ANDREWS						
3070 NB,	AQUA VENTURES	1993	100000	EGGS	NS, LITTLE HARBOUR TROUT FARM/TRENTON						
3071 NB,	L INGALLS, BAR ISLAND	1993	80000	EGGS	NS, MERLIN FISH FARMS/WENTWORTH VALLEY						
3072 NB,	AQUA VENTURES	1993	100000	EGGS	NS, MERLIN FISH FARMS/WENTWORTH VALLEY						
3073 NB,	R POLLAND, BACK BAY	1993	600000	EGGS	NS, MERLIN FISH FARMS/WENTWORTH VALLEY						
4047 ME,	KENNEBEC AQUACULTURE	1994	36000	SMOLT	NS, BAYSIDE SEA FARMS/DIGBY (AQUACULTURE)						
4048 ME,	ATLANTIC AQUAFARMS INC	1994	13000	SMOLT	NS, BASIN EXPERIMENTAL FARMS/DIGBY (AQUACULTURE)						
4049 NB,	KELLY COVE AQUACULTURE	1994	350000	G EGGS	NS, MERLIN FISH FARMS		1994	350000		(AQUACULTURE)	
4050 NB,	FUNDY SALMON LTD	1994	500000	G EGGS	NS, MERLIN FISH FARMS		1994	500000		(AQUACULTURE)	
5077 NB,	KELLY COVE AQUACULTURE	1995	60000	FISH	NS, BAYSIDE SEA FARMS/DIGBY (AQUACULTURE)						
5078 ME	KENNEBEC AQUACULTURE	1995	60000	FISH	NS, BAYSIDE SEA FARMS/DIGBY (AQUACULTURE)						
5079 NB,	KELLY COVE AQUACULTURE	1995	60000	FISH	NS, BAYSIDE SEA FARMS/DIGBY (AQUACULTURE)						
5080 ME,	CONNORS AQUACULTURE DEBLOIS	1995	150000	FRY	NS, MERLIN FISH FARMS/WENTWORTH (AQUACULTURE)						
5081 NB,	R. POLLAND/BAY OF FUNDY(ST JOHN "D")	1995	1300000	G EGGS	NS, MERLIN FISH FARMS (QUARANTINE)		1996		FING	(AQUACULTURE)	
SALMO SALAR [LANDLOCKED ATLANTIC SALMON]											
8005 ME,	GRAND LAKE STREAM HATCHERY	1988	25000	EGGS	NS, M MULLEN/WEYMOUTH (REARING)					BEAR RIVER (AQUACULTURE)	
9002 ME,	GRAND LAKE STREAM HATCHERY	1989	50000	EGGS	NS, FRASERS MILLS HATCHERY						
SALVELINUS ALPINUS [ARCTIC CHAR]											
8001 MAN,	ROCKWOOD HATCHERY	1988	1600	EGGS	NS, NOVA AQUA SMOLT	P				GLACE BAY (AQUACULTURE)	
9001 MAN,	ROCKWOOD HATCHERY	1989	3000	EGGS	NS, SALMONID PROPAGATION ASSOC LTD					ST PETERS	
9003 MAN,	ROCKWOOD HATCHERY	1989	5000	EGGS	NS, MICMAC SMOLTS					WEYMOUTH	
9014 NB,	PURTILL, SUSSEX	1989	10000	EGGS	NS, BRAS D'OR SALMON (TEST)					LITTLE NARROWS	
9015 NB,	PURTILL, SUSSEX	1989	10000	EGGS	NS, SPA CO-OP (EXPERIMENTAL)					ST PETERS	
0030 NB,	PURTILL, SUSSEX	1990	8000	FRY	NS, SALMONID PROPAGATION ASSOC LTD					ST PETERS (EXPERIMENTAL)	
0031 NB,	PURTILL, SUSSEX	1990	5000	FRY	NS, LOCH BRAS D'OR SALMON					BADDECK (EXPERIMENTAL)	
1020 PEI,	INTEGRATED AQUATIC,CHAR QUARANTINE	1991	4500	FING	NS, SALMONID PROPAGATION ASSOC LTD					ST PETERS	
2064 NB,	GREEN ACRES TROUT, GRANDE-DIQUE	1992	30000	FISH	NS, SALMONID PROPAGATION ASSOC LTD					ST PETERS	
2065 PEI,	BROOK VALLEY MARINE FARM, SOURIS	1992	10000	EGGS	NS, SALMONID PROPAGATION ASSOC LTD					ST PETERS	
5082 PEI,	HIDDEN VALLEY CHARR LTD	1995	5000	FISH	NS, SALMONID PROPAGATION ASSOC COOP					ST PETERS (AQUACULTURE)	
SALVELINUS FONTINALIS [BROOK TROUT]											
8002 ME,	PHILLIPS HATCHERY	1988	100000	EGGS	NS, NSDF/FRASERS MILLS H (REARING)	P				VARIOUS WATERS (STOCKING)	
1023 NB,	GREENACRES TROUT H,GRAND DIGUE	1991	400	3" 4"	NS, LARRY PEDERSON/AMHERST						
2081 QUE,	PISCICULTURE ALLEGHANYS	1992	50000	EGGS	NS, MERLIN FF/WENTWORTH VALLEY						
2082 PEI,	BROOK VALLEY MARINE FARM, SOURIS	1992	10000	EGGS	NS, C&G TROUT FARMS/MIDDLETON						
3023 PEI,	BROOK VALLEY MARINE FARM, SOURIS	1993	10000	FISH	NS, C&G TROUT FARMS/MIDDLETON						
3061 NB,	GREENACRES FISH H,GRAND DIGUE	1993-94	20000	EGGS	NS, ROYAL STEVENS/MULGRAVE						

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 ONTARIO

FILE	ORIGINAL SOURCE				TRANSFERS				FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
8004	IN, MIXSABAH HATCHERY (/SKAMANIA)	1988	56000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1988	30000	FING	SEE NEXT LINE	
8004					ONT, NORMANDALE HATCHERY	1989	25000	YEAR	GEORGIAN BAY (RESTORATION)	
8006	MAN, ROCKWOOD HATCHERY (DOM/TAGWERKER)	1988	25000	E EGGS	ONT, PINE VALLEY HATCHERY (QUAR)	1989	?	YEAR	PRIVATE POND (AQUACULTURE)	
9005	IN, TWIN BRANCH H (LK MICHIGAN/SKAM)	1989	80000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1989	35000	FING	SEE NEXT LINE	
9005					ONT, NORMANDALE HATCHERY	1990	31000	YEAR	GEORGIAN BAY (RESTORATION)	
0002	IN, TWIN BRANCH H (LK MICHIGAN/SKAM)	*1990	115000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1990	45000	FING	SEE NEXT LINE	
0002					ONT, NORMANDALE HATCHERY	1991	35000	YEAR	GEORGIAN BAY (RESTORATION)	
1002	WA, BEITEYS RESORT (DOMESTIC SP RUN)	*1991	70000	E EGGS	ONT, OMNR/ALMA HATCHERY (QUAR)	1992	45000	FING	(PRIVATE AQUACULTURE)	
2002	WA, BEITEYS RESORT (DOMESTIC SP RUN)	1992	70000	E EGGS	ONT, U OF GUELPH(ALMA QUAR FAC)	P1992	50000	FING	PRIVATE SECTOR (VARIOUS)	
4051	QUE, PISCICULTURE ST DAMIEN (DOMESTIC)	1995	150000	E EGGS	ONT, SPRING VALLEY TROUT FARM	1995	150000	E EGGS	AQUACULTURE	
6002	QUE, PISCICULTURE ST DAMIEN (DOMESTIC)	1996	58048	E EGGS	ONT, COLD WATER FISHERIES	1996	58048	E EGGS	AQUACULTURE	
6003	QUE, PISCICULTURE ST DAMIEN (DOMESTIC)	1996	100000	E EGGS	ONT, COLD WATER FISHERIES	1996	100000	E EGGS	AQUACULTURE	
SALMO SALAR [ATLANTIC SALMON]										
7010	NS, COLDBROOK FCS (LAHAVE RIVER)	*1987	50000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1988	35000	FING	SEE NEXT LINE	
7010					NORMANDALE HATCHERY	1989	27000	YEAR	LK ONTARIO (RESTORATION)	
7003	ME, GREEN LK H (PENOBSCOT RIVER)	*1987	58000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1987	35000	FING	SEE NEXT LINE	
7003					NORMANDALE HATCHERY	1988	27000	YEAR	LK ONTARIO (RESTORATION)	
7002	SCO, ALLT MOR HATCHERY (LOCAL RIVER)	*1987	35000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1987			SEE NEXT LINE	
7002					NORMANDALE HATCHERY	1987	25000	FING	(PRIVATE AQUACULTURE)	
7011	NB, MACTAQUAC FCS (SAINT JOHN RIVER)	*1987	35000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1987			SEE NEXT LINE	
7011					NORMANDALE HATCHERY	1988	32000	YEAR	(PRIVATE AQUACULTURE)	
1003	NS, MERSEY HATCHERY	*1987	800	FING	ONT, ONTARIO HYDRO (RESEARCH)	1988			STOCK DESTROYED	
8011	NS, COLDBROOK FCS (LAHAVE RIVER)	*1988	61000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1989	FING		SEE NEXT LINE	
8011					NORMANDALE HATCHERY	1990	32000	YEAR	LK ONTARIO (RESTORATION)	
9001	NS, COLDBROOK FCS (LAHAVE RIVER)	*1989	60000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1990	40500	FING	SEE NEXT LINE	
9001					NORMANDALE HATCHERY	1991	36000	YEAR	LK ONTARIO (RESTORATION)	
9001					NORMANDALE HATCHERY	1991	4500	YEAR	INLAND RESTORATION	
0003	NS, COLDBROOK FCS (LAHAVE RIVER)	*1990	80000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1991	35000	FING	SEE NEXT LINE	
0003					NORMANDALE HATCHERY	P1992	32000	YEAR	LK ONTARIO (RESTORATION)	
1004	NS, COLDBROOK FCS (LAHAVE RIVER)	1991	60000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1992	50000	FING	SEE NEXT LINE	
1004					RINGWOOD FCS	P1993	45000	YEAR	LK ONTARIO (RESTORATION)	
2001	NB, ST ANDREWS RESEARCH STA(UNKNOWN)	1991	40000	EGGS	UNIVERSITY OF GUELPH(RESEARCH)	1992	40000	SAC FRY	DESTROYED	
2004	NS, COLDBROOK HAT (LAHAVE RIVER)	P1992	80000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1993	50000	FING	RINGWOOD FCS	
2004					OMNR LAKE ONTARIO	P1994		YEAR	REHAB STOCKING	
3132	NS, COLDBROOK HAT (LAHAVE RIVER)	1993	78000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1994	55000	FING	SEE NEXT LINE	
3132					RINGWOOD HATCHERY	P1995	50000	YEAR	LK ONTARIO (REHAB STOCKING)	
3134	NS, COLDBROOK HAT (LAHAVE RIVER)	P1994	80000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1995	55000	FING	SEE NEXT LINE	
3134					RINGWOOD HATCHERY	P1996	50000	YEAR	LK ONTARIO (REHAB STOCKING)	
4052	NS, COLDBROOK HAT (LAHAVE RIVER)	P1995	60000	G EGGS	ONT, OMNR/NORMANDALE H	P1995	60000	G EGGS	DEV OF BROODSTOCK	
5109	NS, COLDBROOK HAT (LAHAVE RIVER)	1995	7500	E EGGS	ONT, OMNR/NORMANDALE H	1995	7500	E EGGS	DEV OF BROODSTOCK	
6004	NS, COLDBROOK HAT (LAHAVE RIVER)	P1996	10000	E EGGS	ONT, OMNR/NORMANDALE H	P1996	10000	E EGGS	DEV OF BROODSTOCK	
SALMO SALAR [LANDLOCKED ATLANTIC SALMON]										
6002	NY, ADIRONDACK H (LITTLE CLEAR POND)	*1986	3400	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1987			SEE NEXT LINE	
6002					NORMANDALE HATCHERY	1987	1000	SMOLTS	LK ONTARIO (RESTORATION)	
8005	ME, GRAND LK STREAM H (WEST GRAND LK)	*1988	75000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1988		FING	SEE NEXT LINE	
8005					NORMANDALE HATCHERY	1989	58000	YEAR	LK ONTARIO (RESTORATION)	
9002	ME, GRAND LK STREAM H (WEST GRAND LK)	1989	63000	E EGGS	ONT, OMNR/NORMANDALE H (QUAR)	1989		FING	SEE NEXT LINE	
9002					NORMANDALE HATCHERY	1989	52000	YEAR	LK ONTARIO (RESTORATION)	
0006	ME, GRAND LK STREAM H (WEST GRAND LK)	*1990	110000	E EGGS	ONT, OMNR/NORMANDALE & ALMA (QUAR)	1990	81000	FING	SEE NEXT 2 LINES	
0006					NORMANDALE & ALMA HATCHERIES	1991	31000	YEAR	(REHABILITATION STOCKING)	
0006					NORMANDALE & ALMA HATCHERIES	1991	24000	YEAR	BROODSTOCK DEV	
SALVELINUS ALPINUS [ARCTIC CHAR]										
7007	NB, HUNTSMAN MARINE LABORATORY	1987	30	FING	ONT, SIR WILFRED U (RESEARCH)				STOCK DESTROYED	
7009	ICE, UNIVERSITY OF ICELAND	1987	3000	EGGS	ONT, U OF GUELPH (RESEARCH)				STOCK DESTROYED	
7006	NB, HUNTSMAN MARINE LABORATORY	1987	200	FING	ONT, U OF GUELPH (RESEARCH)				STOCK DESTROYED	
8009	ICE, U OF ICELAND (THINGVALLAVATN LK)	1988	2000	EGGS	ONT, U OF GUELPH (RESEARCH)				STOCK DESTROYED	
8007	MAN, ROCKWOOD H (FRASER R, LAB)	*1988	5000	E EGGS	ONT, PINE VALLEY HATCHERY (QUAR)	1989	3500		COLD WATER H (PRIVATE AQC)	
9006	MAN, ROCKWOOD H (FRASER R, LAB)	*1989	5000	E EGGS	ONT, ONTARIO VET COLLEGE (AQC DEV)				ALL FISH DIED	
9003	MAN, ROCKWOOD H (FRASER R, LAB)	*1989	30000	E EGGS	ONT, COLDWATER & ALMA H (QUAR)	P1990	20000	FING	(PRIVATE AQC BROODSTOCK)	

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
SALVELINUS ALPINUS [ARCTIC CHAR] CONTINUED									
0001 MAN,	ROCKWOOD HATCHERY (VARIOUS\)	*1990	67000	E EGGS	ONT, OMN/COLDWATE ALMA H (QUAR)	1991	30000	FING	(PRIVATE AQUACULTURE)
1001 MAN,	ROCKWOOD HATCHERY (VARIOUS\)	*1991	68800	E EGGS	ONT, COLDWATER & ALMA H (QUAR)	P1992			SEE NEXT 2 LINES
1001					COLDWATER & ALMA HATCHERIES	P1992		FING	(AQC BROODSTOCK)
1001					COLDWATER & ALMA HATCHERIES	P1992		FING	(AQC BROODSTOCK)
2005 MAN,	ROCKWOOD HATCHERY(VARIOUS)	P1992	50000	E EGGS	U OF GUELPH (ALMA QUAR UNIT)	P1993			SEE NEXT LINE
2005						P1993	40000	FING	PRIVATE SECT (BROODSTOCK DEV)
3131 NB,	UNIVERSITY OF N B (VARIOUS)	1992	500	FING	ONT, LAKEHEAD UNIVERSITY	1992	500	FING	TO BE DESTROYED
SALVELINUS FONTINALIS X SALVELINUS ALPINUS [CHARBROOK]									
8008 QUE,	SILVER SPRINGS HATCHERY	1988	500	FISH	ONT, U OF OTTAWA (RESEARCH)				INCINERATED
SALVELINUS NAMAYCUSH [LAKE TROUT]									
1005 NY,	SENECA LAKE (SENECA LAKE/WILD)	*1990	70000	G EGGS	ONT, OMNR/NORMANDALE QUAR UNIT	1991	65000	FING	SEE NEXT LINE
1005					WHITE LAKE HATCHERY	P1992	51000	YEAR	LK ONTARIO (REHABILITATION)
1005					LAKE ONTARIO	P1992	14000	YEAR	BROODSTOCK DEV
1006 NY,	SENECA LAKE (SENECA LAKE/WILD)	1991	70000	G EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1992	60000	FING	SEE NEXT LINE
1006					WHITE LAKE HATCHERY	P1993	50000	YEAR	LK ONTARIO (REHAB & BRD STOCK)
2003 NY,	SENECA LAKE (SENECA LAKE/WILD)	P1992	70000	G EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1993	60000	FING	SEE NEXT LINE
2003					NORMANDALE FCSP	1994	50000	YEAR	REHAB & BROODSTOCK DEV
3130 NY,	SENECA LAKE (SENECA LAKE/WILD)	1993	70000	G EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1994	60000	FING	SEE NEXT LINE
3130					NORMANDALE FCSP	P1995	50000	YEAR	LK ONTARIO (REHAB & BROODSTOCK DEV)
3133 PA,	ALLEGHENY NFH (LAKE ERIE)				ONT, BAYFIELD INSTITUTE	1994	5000	EGGS	TO BE DESTROYED
3135 NY,	SENECA LAKE (SENECA LAKE/WILD)	P1994	70000	G EGGS	ONT, OMNR/NORMANDALE H (QUAR)	P1995	60000	FING	SEE NEXT LINE
3135					NORMANDALE FCSP	P1996	50000	YEAR	LK ONTARIO (REHAB & BROODSTOCK DEV)
4053 NY,	NYDEC, SENECA LAKE (WILD)	1994	80000	G EGGS	ONT, OMNR/NORMANDALE H	1994	80000	G EGGS	LK ONTARIO (REHAB & BROODSTOCK DEV)
4054 NY,	NYDEC, SENECA LAKE (WILD)	P1995	80000	G EGGS	ONT, OMNR/NORMANDALE H (QUAR)				DID NOT OCCUR

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 PRINCE EDWARD ISLAND

FILE	ORIGINAL SOURCE			TRANSFERS				FINAL DISPOSITION	
	LOCATION (STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION (PURPOSE)
ONCORHYNCHUS KISUTCH [COHO SALMON]									
9017	BC, PRIVATE AQUACULTURE FACILITY	1989	10000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
0009	BC, CHILLIWACK RIVER HATCHERY	1990	40000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
1008	BC, BIG QUALICUM HATCHERY	1991	40000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
2013	BC, BIG QUALICUM HATCHERY	1992	50000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
3096	BC, BIG QUALICUM HATCHERY	1993	21000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
4055	BC, BIG QUALICUM HATCHERY	1994	10000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
5083	BC, BIG QUALICUM HATCHERY	1995	20000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
ONCORHYNCHUS MYKISS [RAINBOW TROUT]									
	ONT, RAINBOW SPRINGS HATCHERY	1986	50000	EGGS	PEI, GLYNDE RIVER AQUACULTURE				BREADALBANE (AQUACULTURE)
7004	ONT, RAINBOW SPRINGS HATCHERY	1987	50000	FING	PEI, SILVER SEA AQUACULTURE				LITTLE YORK (AQUACULTURE)
7007	ONT, AQUAFARMS CANADA	1987	25000	FING	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
7003	ONT, RAINBOW SPRINGS HATCHERY	1987	100000	EGGS	PEI, GLYNDE RIVER AQUACULTURE				BREADALBANE (AQUACULTURE)
7002	ONT, RAINBOW SPRINGS HATCHERY	1987	100000	EGGS	PEI, INTEGRATED AQUATIC SYSTEMS				BROOKVALE (AQUACULTURE)
7011	ONT, RAINBOW SPRINGS HATCHERY	1987	75000	EGGS	PEI, GLYNDE RIVER AQUACULTURE				BREADALBANE (AQUACULTURE)
7010	ONT, VAN AQUA INC	1987	250000	EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
7009	QUE, PISCICULTURE ALLEGHANYS	1987	15000	FING	PEI, EDWARD MURPHY				KENSINGTON (AQUACULTURE)
7008	WA, BEITEYS RESORT	1987	200000	FING	PEI, INTEGRATED AQUATIC SYSTEMS				BROOKVALE (AQUACULTURE)
7001	ONT, RAINBOW SPRINGS HATCHERY	1987	50000	EGGS	PEI, GLYNDE RIVER AQUACULTURE				BREADALBANE (AQUACULTURE)
7005	ONT, RAINBOW SPRINGS HATCHERY	1987	50000	FING	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
7012	ONT, AQUAFARMS CANADA	1988	30000	EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
8001	QUE, PISCICULTURE ALLEGHANYS	1988	50000	FING	PEI, EDWARD MURPHY (REARING)				HUNTER R (AQUACULTURE)
8002	WA, BEITEYS RESORT	1988	200000	EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
8003	WA, BEITEYS RESORT	1988	250000	EGGS	PEI, INTEGRATED AQUATICS (REARING)				BROOKVALE (AQUACULTURE)
8004	ONT, RAINBOW SPRINGS HATCHERY	1988	125000	EGGS	PEI, GLYNDE RIVER AQUACULTURE				GLYNDE R (AQUACULTURE)
8005	ONT, RAINBOW SPRINGS HATCHERY	1988	25000	TR EGG	PEI, GLYNDE RIVER AQUACULTURE				GLYNDE R (AQUACULTURE)
9001	ONT, RAINBOW SPRINGS HATCHERY	1989	25000	FING	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
9002	ONT, RAINBOW SPRINGS HATCHERY	1989	43500	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
9003	ONT, RAINBOW SPRINGS HATCHERY	1989	68500	E EGGS	PEI, BROOKVALLEY MARINE FARMS)				SOURIS (AQUACULTURE)
9004	ONT, RAINBOW SPRINGS HATCHERY	1989	20000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
9005	WA, BEITEYS RESORT	1989	24384	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
9009	ONT, RAINBOW SPRINGS HATCHERY	1989	75000	E EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
9010	ONT, RAINBOW SPRINGS HATCHERY	1989	10000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
0007	ONT, RAINBOW SPRINGS HATCHERY	1989	10000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
0012	ONT, RAINBOW SPRINGS HATCHERY	1990	10000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				TO BE DESTROYED
0001	ONT, RAINBOW SPRINGS HATCHERY	1990	50000	TR EGG	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
0002	ONT, RAINBOW SPRINGS HATCHERY	1990	165100	E EGG	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
0003	ONT, RAINBOW SPRINGS HATCHERY	1990	50000	TR EGG	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
0004	ONT, RAINBOW SPRINGS HATCHERY	1990	200000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
0005	ONT, RAINBOW SPRINGS HATCHERY	1990	100000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
0006	WA, BEITEYS RESORT	1990	20000	E EGGS	PEI, AQUA HEALTH (VACCINE DEV)				CHARLOTTETOWN (DESTROYED)
1001	QUE, PISCICULTURE ALLEGHANYS	1991	25000	E EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
1002	WA, BEITEYS RESORT	1991	20000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
1003	QUE, PISCICULTURE ALLEGHANYS	1991	50000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
1004	NB, GREENACRES TROUT HATCHERY	1991	4000	FING	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
1005	QUE, PISCICULTURE ALLEGHANYS	1991	10000	FING	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
1006	NB, GREENACRES TROUT HATCHERY	1991	1500	FING	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
1007	NB, SEA FARMS (CANADA)	1991	40000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
1019	NB, GREENACRES TROUT HATCHERY	1992	35000	E EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
2014	QUE, PISCICULTURE ALLEGHANYS	1992	75000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
2015	NB, GREENACRES TROUT HATCHERY	1992	2000	FING	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
2016	NB, GREENACRES TROUT HATCHERY	1992	4500	FING	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
2017	NB, GREENACRES TROUT HATCHERY	1992	1000	FING	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
2018	NB, GREENACRES TROUT HATCHERY	1992	20000	FING	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)
2019	WA, BEITEYS RESORT	1992	10000	E EGGS	PEI, AQUA HEALTH (VACCINE RESEARCH)				TO BE DESTROYED
2054	ONT, RAINBOW SPRINGS HATCHERY	1992	65000	EGGS	PEI, BROOKVALLEY MARINE FARM/SOURIS				SOURIS (AQUACULTURE)
3090	QUE, PISCICULTURE ALLEGHANYS	1993	60000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
3091	QUE, PISCICULTURE ALLEGHANYS (SEX REV)	1993	10	GONADS	PEI, BROOKVALLEY MARINE FARM/SOURIS				SOURIS (AQUACULTURE)
3092	WA, TROUTLODGE INC	1993	20000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
3093	ONT, RAINBOW SPRINGS HATCHERY	1993	1000	FRY	PEI, AQUA HEALTH (VACCINE RESEARCH)				
4056	WA, TROUTLODGE INC	1994	25000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
4057	QUE, PISCICULTURE ALLEGHANYS	1994	55000	E EGGS	PEI, DOVER FISH HATCHERY				DOVER (AQUACULTURE)
4058	QUE, PISCICULTURE ALLEGHANYS	1994	25000	E EGGS	PEI, BROOKVALLEY MARINE FARMS				SOURIS (AQUACULTURE)

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	YEAR	NUMBER	STAGE	TRANSFERS SPONSOR/FACILITY	(PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION	(PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT] (CONTINUED)											
4059 NB,	GREENACRES TROUT HATCHERY	1994	3200	FING	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
5084 QUE,	PISCICULTURE DAINT-DAMIEN	1995	50000	EGGS	PEI, DOVER FISH HATCHERY/MURRAY RIVER					(AQUACULTURE)	
5085 WA,	TROUTLODGE INC	1995	70000	EGGS	PEI, DOVER FISH HATCHERY/MURRAY RIVER					(AQUACULTURE)	
SALVELINUS ALPINUS [ARCTIC CHAR]											
7013 MAN,	ROCKWOOD HATCHERY	1987	5000	EGGS	PEI, ATL VETERINARY COLLEGE						
8006 NB,	HUNTSMAN MARINE LABORATORY	1988	500	FING	PEI, INTEGRATED AQUATICS	(REARING)				BROOKVALE	(AQUACULTURE)
9006 NB,	HML (FRASER R, LABRADOR)	1989	50000	E EGGS	PEI, IAS/BROOKVALE	(QUARANTINE)	1989	45600	FING	BROOKVALE	(AQUACULTURE)
9008 MAN,	ROCKWOOD H (FRASER R, LABRADOR)	*1989	3000	E EGGS	PEI, DOVER FISH HATCHERY					DOVER	(BROODSTOCK DEV)
0018 NB,	PURTILL B FISH	1989	12000	E EGGS	PEI, IAS	(EXP QUARANTINE PROGRAM)	1990	131397	FING	BROOKVALE	(AQUACULTURE)
0019 NB,	PURTILL B FISH	1990	88000	E EGGS	PEI, IAS	(EXP QUARANTINE PROGRAM)				-RELEASED FROM	
0020 NB,	PURTILL B FISH	1990	15000	S FRY	PEI, IAS	(EXP QUARANTINE PROGRAM)				QUARANTINE, BROOKVALE	
0021 NB,	PURTILL B FISH	1990	62000	S FRY	PEI, IAS	(EXP QUARANTINE PROGRAM)				(AQUACULTURE)	
5086 NB,	PLACEMENTS GGR LTEE/BAS-CARAQUET	1995	15000	EGGS	PEI, DOVER FISH HATCHERY/MURRAY RIVER					(AQUACULTURE)	
5087 QUE,	PISCICULTURE ST-DAMIEN	1995	5000	FRY	PEI, DOVER FISH HATCHERY/MURRAY RIVER					(AQUACULTURE)	
SALVELINUS FONTINALIS [BROOK TROUT]											
7006 ONT,	WILDCAT TROUT FARM	1987	20000	JUV	PEI, GLYNDE RIVER AQUACULTURE					BREADALBANE	(AQUACULTURE)
SALMO SALAR [ATLANTIC SALMON]											
8007 NB,	HML (SAINT JOHN CULTURED)	1988	45000	FRY	PEI, ATL VET COLLEGE	(REARING				(AQUACULTURE)	
9007 NB,	BOF CAGE SITE (SAINT JOHN RIVER)	1989	50000	E EGGS	PEI, IAS/BROOKVALE	(QUARANTINE)	1989	18300	FING	BROOKVALE	(AQUACULTURE)
9011 NB,	SEA FARMS CANADA	1989	2000	FRY	PEI, ATL VET COLLEGE	(RESEARCH)				TO BE DESTROYED	
9012 NB,	HUNTSMAN MARINE LABORATORY	1989	1500	PYP	PEI, ATL VET COLLEGE	(RESEARCH)				TO BE DESTROYED	
9013 NB,	SEA FARMS CANADA	1989	10000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
9014 NS,	MERSEY FCS	1989	7500	FING	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
9015 SCO,	PRIVATE FACILITY	1989	10000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
9016 NOR,	PRIVATE AQUACULTURE FACILITY	1989	10000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0008 NS,	COLDBROOK FCS	1989	20000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0022 NB,	MIRAMICHI FCS (MIRAMICHI)	1989	70000	G EGGS	PEI, DFO/CARDIGAN FCS	(QUAR)				PEI	(ENHANCEMENT PROGRAMS)
0010 NB,	SEA FARMS CANADA	1990	15000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0011 NB,	SEA FARMS CANADA	1990	400	FING	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0013 SCO,	MARINE HARVEST LIMITED	1990	10000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0014 NOR,	JAKTA FISKEOPPDRETT AS	1990	10000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0015 ME,	KENNEBEC AQUACULTURE	1990	2000	PARR	PEI, AQUA HEALTH	(RESEARCH)				TO BE DESTROYED	
0016 NB,	SEA FARMS CANADA	1990	2050	FING	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0017 NB,	SEA FARMS CANADA	1990	393	P SMT	PEI, AQUA HEALTH	(RESEARCH)				TO BE DESTROYED	
0023 NB,	MIRAMICHI FCS (MIRAMICHI/NW)	1990	55000	G EGGS	PEI, DFO/CARDIGAN FCS	(QUAR)				PEI	(ENHANCEMENT PROGRAMS)
0024 NS,	COLDBROOK FCS	1990	20000	E EGGS	PEI, AQUA HEALTH	(VACCINE DEV)				TO BE DESTROYED	
0025 NB,	SALMON DEMONSTRATION FARM	1990	250	1 Kg	PEI, ATL VET COLLEGE	(RESEARCH)				TO BE DESTROYED	
1009 ME,	KENNEBEC AQUACULTURE	1991	2500	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
1010 NB,	SEA FARMS (CANADA)	1991	1600	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
1011 NB,	SEA FARMS (CANADA)	1991	5000	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
1012 ME,	KENNEBEC AQUACULTURE	1991	6000	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
1013 NS,	COLDBROOK FCS	1991	20000	E EGGS	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
1014 NB,	SEA FARMS (CANADA)	1991	350	SMOLT	PEI, AVC	(FISH HEALTH RESEARCH)				TO BE DESTROYED	
1015 NB,	SALMON DEMONSTRATION FARM	1991	350	P SMT	PEI, AVC	(FISH HEALTH RESEARCH)				TO BE DESTROYED	
1016 NB,	SALMON DEMONSTRATION FARM	1991	60	ADULT	PEI, AVC	(FISH HEALTH RESEARCH)				TO BE DESTROYED	
1017 NH,	NEW ENG FISH FARM ENT	1991	19000	FRY	PEI, BROOKVALLEY MARINE FARMS					SOURIS	(BROODSTOCK DEV)
1018 NB,	BRIDEN CONSULTANTS LTD	1991	10000	FRY	PEI, BROOKVALLEY MARINE FARMS					SOURIS	(BROODSTOCK DEV)
2020 ME,	KENNEBEC AQUACULTURE INC	1992	5000	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
2021 NB,	BRIDEN CONSULTANTS LTD	1992	30000	E EGGS	PEI, BROOKVALLEY	(QUARANTINE)	1992	22000	FRY	SOURIS	(BROODSTOCK DEV)
2022 NB,	SEA FARMS (CANADA)	1992	9000	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
2023 NS,	MERSEY FCS	1992	10000	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
2024 ME,	KENNEBEC AQUACULTURE INC	1992	125	PARR	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
3094 NB,	BRIDEN CONSULTANTS LTD (ST JOHN)	1993	40000	E EGGS	PEI, BROOKVALLEY MARINE/SOURIS		1993	20000	FRY	SOURIS	(AQUACULTURE)
3095 NB,	JAIL ISLAND SALMON LTD (ST JOHN)	1993	200000	G EGGS	PEI, BROOKVALLEY MARINE /SOURIS		P1994		FRY	SOURIS	(AQUACULTURE)
3097 NS,	COLDBROOK FCS (LAHAVE RIVER)	1993	30000	E EGGS	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
4060 NS,	MERLIN FISH FARMS	1994	6000	FING	PEI, AQUA HEALTH	(VACCINE RESEARCH)				TO BE DESTROYED	
5088 NB,	KCW FISH (BFAI)	1995	900	1 KG	PEI, ATL VETERINARY COLLEGE	(FISH HEALTH RESEARCH)				TO BE DESTROYED	
5089 NB,	RIVERBEND SALMON FACILITY (BOFAI)	1995	40	40-80G	PEI, ATL VETERINARY COLLEGE	(FISH HEALTH RESEARCH)				TO BE DESTROYED	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995 QUEBEC

FILE	ORIGINAL SOURCE	TRANSFERS							FINAL DISPOSITION	
LOCATION	(STOCK/STRAIN)	YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
COREGONUS CLUPEAFORMIS [LAKE WHITEFISH]										
8004 ONT,	WHITELAKE HATCHERY	1988	700	FING	LAVAL UNIVERSITY P(RESEARCH)			TO BE DESTROYED		
COREGONUS LAVARETUS [LAKE WHITEFISH]										
7003 FIN,	(VAASA)	1987	150	G EGGS	LAVAL UNIVERSITY (RESEARCH)	P			TO BE DESTROYED	
ONCORHYNCHUS KISUTCH [COHO SALMON]										
7001 BC,	ROSEWALD CREEK HATCHERY	1987	150	JUV	LAVAL UNIVERSITY (RESEARCH)	P			TO BE DESTROYED	
ONCORHYNCHUS MYKISS [RAINBOW TROUT]										
7002 ONT,	AQUAFARMS CANADA	1987	50000	EGGS	QUE, BILL NOWELL				(AQUACULTURE)	
8001 PEI,	GLYNDE RIVER AQUACULTURE	1988	80000	FING	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
8002 ONT,	REDBOW FARMS	1988	80000	FING	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
8003 ONT,	ABERFOYLE FISHERIES	1988	80000	FING	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
8005 ONT,	SPRING VALLEY HATCHERY	1988	600000	EGGS	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
9007 ONT,	AQUAFARMS CANADA (DOMESTIC)	1988	100000	EGGS	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
9003 ONT,	SPRING VALLEY H (DOMESTIC)	1989	100000	FRY	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
9008 ONT,	SPRING VALLEY H (DOMESTIC)	1989	1000000	EGGS	QUE, FERME ST MATHIEU				(AQUACULTURE-MARKET)	
0001 ONT,	WILDCAT TROUT FARM	1990	40000	FRY	QUE, SALMONID INC/HATCHERY				(AQUACULTURE)	
1001 ONT,	RAINBOW SPRING HATCHERY	1991	1000	FRY	QUE, ANALEX INC/LAB				BIOASSAY	
1002 ONT,	RAINBOW SPRING HATCHERY	1991	1000	FRY	QUE, CONSULTANTS BEAK LTEE/LAB				BIOASSAY	
1003 ONT,	RAINBOW SPRING HATCHERY	1991	1000	FRY	QUE, LAB. CENTRE ST-LAURENT				BIOASSAY	
2087 ONT,	RAINBOW SPRING HATCHERY	1992	1000	FRY	QUE, ANALEX INC/LABORATORY				BIOASSAY	
2088 ONT,	RAINBOW SPRING HATCHERY	1992	150000	EGGS	QUE, FERME ST MATHIEU				(AQUACULTURE)	
2089 NY,	HINCHENBROOKE HATCHERY	1992	350	YEAR	QUE, GRAHAM FLOWERS/FISH POND				STOCKING	
2090 NY,	HINCHENBROOKE HATCHERY	1992	450	YEAR	QUE, S. LEGER/FISH POND				STOCKING	
2091 NY,	HINCHENBROOKE HATCHERY	1992	550	YEAR	QUE, FRED FARQUHAR/FISH POND				STOCKING	
2092 NY,	HINCHENBROOKE HATCHERY	1992	500	YEAR	QUE, GEORGE DAIGLE/FISH POND				STOCKING	
2093 ONT,	RAINBOW SPRING HATCHERY	1992	9150	FRY	QUE, CONSULTANTS BEAK LTEE/LAB					
2094 ONT,	RAINBOW SPRING HATCHERY	1992	2000	FRY	QUE, CONSULTANTS BEAK LTEE/LAB				BIOASS	
3098 ONT,	SPRING VALLEY TROUT	1993	150000	EGGS	QUE, TRUITE ST MATHIEU				(AQUACULTURE)	
3100 ONT,	RAINBOW SPRING HATCHERY	1993	3500	FRY	QUE, ANALEX INC/LABORATORY				BIOASSAY	
3101 NY,	HINCHENBROOKE HATCHERY	1993	200	YEAR	QUE, CLAIRMONT FAILLE/FISH POND				STOCKING	
3102 ONT,	RAINBOW SPRING HATCHERY	1993	12000	FRY	QUE, CONSULTANTS BEAK/LABORATORY				BIOASSAY	
3103 WA,	TROUTLODGE	1993	200000	EGGS	QUE, SCOTT GRAHAM/HATCHERY				(AQUACULTURE)	
3104 ONT,	RAINBOW SPRING HATCHERY	1993	10000	EGGS	QUE, ECO-CNFS/LABORATORY				BIOASSAY	
3105 WA,	TROUTLODGE	1993	1000000	EGGS	QUE, MICHEL BOMBARDIER/HATCHERY				(AQUACULTURE)	
3106 ONT,	RAINBOW SPRING HATCHERY	1993	2000	FRY	QUE, MENVIQ/LABORATORY				BIOASSAY	
3108 WA,	TROUTLODGE	1993	100000	EGGS	QUE, JEAN-PIERRE REVILLE/HATCHERY				(AQUACULTURE)	
4061 WA,	TROUTLODGE	1994	1150000	EGGS	QUE, TRUITE DES SOURCES 1990 INC/HATCHERY				(AQUACULTURE)	
4062 WA,	TROUTLODGE	1994	675000	EGGS	QUE, ROBERT ZAGIEWICH/HATCHERY				(AQUACULTURE)	
4063 WA,	TROUTSPRING FACILITIES	1994	100000	EGGS	QUE, LIMNO-SERVICE/HATCHERY				(AQUACULTURE)	
4064 ONT,	RAINBOW SPRING HATCHERY	1994	3750	FRY	QUE, ENVIRONNEMENT LCQ INC/LABORATORY				BIOASSAY	
4065 ONT,	RAINBOW SPRING HATCHERY	1994	6000	FRY	QUE, ENVIRONNEMENT CANADA/LABORATORY				BIOASSAY	
4066 ONT,	RAINBOW TROUT HATCHERY	1994	2000	FRY	QUE, MODULE BIOLOGIE ET TOXICITE				BIOASSAY	
4067 ONT,	RAINBOW SPRING HATCHERY	1994	60000	FRY	QUE, LABORATOIRES ECO-CNFS				BIOASSAY	
4068 ONT,	RAINBOW SPRING HATCHERY	1994	30000	FRY	QUE, ROBERT ZAGIEWICH/HATCHERY				(AQUACULTURE)	
4069 ONT,	RAINBOW SPRING HATCHERY	1994	1000	FRY	QUE, CONSULTANTS BEAK LTEE/LABORATORY				BIOASSAY	
4070 ONT,	RAINBOW SPRING HATCHERY	1994	2500	FRY	QUE, ALAIN BOURGEOIS/LABORATORY				BIOASSAY	
4071 ONT,	RAINBOW SPRING HATCHERY	1994	6000	FRY	QUE, ANALEX INC/LABORATORY				BIOASSAY	
5090 WA,	TROUTLODGE	1995	100000	EGGS	QUE, TRUITES ST-MATHIEU				(AQUACULTURE)	
5091 WA,	TROUTLODGE	1995	650000	EGGS	QUE, TRUITES DES SOURCES				(AQUACULTURE)	
5092 ONT,	RAINBOW SPRING HATCHERY	1995	6000	FRY	QUE, LABORATOIRES ECO-CNFS				BIOASSAY	
5093 ONT,	RAINBOW SPRING HATCHERY	1995	3000	FRY	QUE, ENVIRONNEMENT CANADA/LABORATORY				BIOASSAY	
5094 ONT,	RAINBOW SPRING HATCHERY	1995	2000	FRY	QUE, PATES ET PAPIERS DU CANADA				BIOASSAY	
5095 ONT,	RAINBOW SPRING HATCHERY	1995	21000	FRY	QUE, LABORATOIRES ECO-CNFS				BIOASSAY	
5096 ONT,	RAINBOW SPRING HATCHERY	1995	2000	FRY	QUE, ENVIRONNEMENT LQC/LABORATORY				BIOASSAY	
5097 WA,	TROUTLODGE	1995	100000	EGGS	QUE, SCOTT GRAHAM				(AQUACULTURE)	
5098 ONT,	RAINBOW SPRING HATCHERY	1995	1000	FRY	QUE, ANALEX INC/LABORATORY				BIOASSAY	
5099 WA,	TROUTLODGE	1995	650000	EGGS	QUE, TRUITES DES SOURCES				(AQUACULTURE)	
5100 WA,	TROUTLODGE	1995	100000	EGGS	QUE, TRUITES ST-MATHIEU/HATCHERY				(AQUACULTURE)	
5101 ONT,	RAINBOW SPRING HATCHERY	1995	1500	FRY	QUE, ANALEX INC/LABORATORY				BIOASSAY	
5102 ONT,	RAINBOW SPRING HATCHERY	1995	10000	FRY	QUE, LABORATOIRES ECO-CNFS				BIOASSAY	
5103 ONT,	RAINBOW SPRING HATCHERY	1995	5000	FRY	QUE, LABORATOIRES ECO-CNFS				BIOASSAY	

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

QUEBEC

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	YEAR	NUMBER	STAGE	FINAL DISPOSITION LOCATION (PURPOSE)
SALMO SALAR [ATLANTIC SALMON]									
0005 NB,	SEA FARMS, DIGDEGUASH	1990	?	SMOLTS	QUE, BAIE DES CHALEURS AQC				(AQUACULTURE)
1004 NB,	KELLY COVE BROODSTOCK	1991	60000	EGGS	QUE, BAIE DES CHALEURS AQC				(AQUACULTURE)
SALVELINUS ALPINUS [ARCTIC CHAR]									
9002 MAN,	ROCKWOOD HATCHERY (WILD)	1989	20000	FRY	QUE, INRS/RIMOUSKI (RESEARCH)				
9005 MAN,	ROCKWOOD HATCHERY (WILD)	1989	5000	EGGS	QUE, J P THONNEY HATCHERY				(AQUACULTURE)
9006 MAN,	ROCKWOOD HATCHERY (WILD)	1989	5000	EGGS	QUE, RECHERCHE LA PETITE NATION				(AQUACULTURE)
0002 BC,	SUN VALLEY TROUT FARM	1990	15000	EGGS	QUE, PISCICULTURE ALLEGHANYS				
0003 BC,	SUN VALLEY TROUT FARM	1990	12000	EGGS	QUE, INRS/RIMOUSKI (RESEARCH)				
0004 MAN,	ROCKWOOD HATCHERY	1990	15000	EGGS	QUE, MAPA (RESEARCH)				
1005 NB,	GREENACRES TROUT HATCHERY	1991	3000	EGGS	QUE, INSTITUT TECHNOLOGIE AGRICOLE				RESEARCH
1006 NB,	GREENACRES TROUT HATCHERY	1991	15000	EGGS	QUE, PISCICULTURE ALLEGHANYS				(AQUACULTURE)
1007 MAN,	WILDWOOD TROUT FARM	1991	13000	EGGS	QUE, MAPA (RESEARCH)				RESEARCH
2095 NB,	GREENACRES TROUT HATCHERY	1992	3000	EGGS	QUE, MAPAC				(RESEARCH)
2096 NB,	GREENACRES TROUT HATCHERY	1992	3000	FRY	QUE, FERME ST MATHIEU				(AQUACULTURE)
2097 NB,	GREENACRES TROUT HATCHERY	1992	15000	EGGS	QUE, PISCICULTURE ALLEGHANYS				(AQUACULTURE)
3099 NB,	GREENACRES TROUT HATCHERY	1993	15000	FRY	QUE, TRUITE STe MATHIEU/HATCHERY				(AQUACULTURE)
3107 NB,	GREENACRES TROUT HATCHERY	1993	30000	EGGS	QUE, PISCICULTURE ALLEGHANYS				(AQUACULTURE)
3109 YUK,	POLAR SEAS FISHERIES	1993	35000	EGGS	QUE, BAIE DES CHALEURS/HATCHERY				(AQUACULTURE)
4072 NB,	GREENACRES FISH HATCHERY	1994	130000	EGGS	QUE, MAPAQ/HATCHERY				(AQUACULTURE)
5104 YUK,	ICY WATERS	1995	30000	EGGS	QUE, SAUKEB HATCHERY				(AQUACULTURE)
SALVELINUS FONTINALIS [BROOK TROUT]									
9001 ONT,	THISTLE SPRINGS FARM (DOMESTIC)	1989	2000	YEAR	QUE, CENTRE DE PECHE BLAINVILLE				(POND FISHING)
9004 ME,	PHILLIPS HATCHERY (DOMESTIC)	1989	10000	FRY	QUE, (HOLDING PRIOR TO STOCKING ?	1989	10000	FRY	SJR, MAINE (STOCKING)

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

RHODE ISLAND

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY (PURPOSE)	FINAL DISPOSITION YEAR	NUMBER	STAGE	LOCATION (PURPOSE)
ONCORHYNCHUS MYKISS [RAINBOW TROUT]									
6001 WA,	TROUT LODGE (UNKNOWN)	1986	150000	EGGS	RI,	P1988?		2+	STATEWIDE (STOCKING)
7001 WA,	TROUT LODGE (UNKNOWN)	1987	150000	EGGS	RI,	P1989?		2+	STATEWIDE (STOCKING)
3013 MA,	PLYMOUTH ROCK TROUT H (DOM)	1994	61500	EGGS	RI, PERRYVILLE TROUT H (HISTORY OF BF)				
SALMO SALAR [ATLANTIC SALMON]									
2100 ME,	KENNEBEC H (PEN-ST JOHN)	1992	20300	PARR	RI, RIDFW	1992	20300	PARR	PAWCATUCK R (RESTORATION)
2101 RI,	PERRIVILE H (PAWCATUCK R)	1992	5000	PARR	RI, RIDFW	1992	5000	PARR	PAWCATUCK R (RESTORATION)
2102 MA,	N ATTLEBORO H (MERRIMAC R)	1992	2500	SMOLT	RI, RIDFW	1992	2500	SMOLT	BEAVER RIVER (URI RESEARCH)
2103 MA,	N ATTLEBORO H (MERRIMAC R)	1992	45500	PARR	RI, RIDFW	1992	45500	PARR	PAWCATUCK R (RESTORATION)
2104 NH,	NASHUA H (MERRIMAC R)	1992	5000	P/S	RI, RIDFW	1992	5000	P/S	PAWCATUCK R (RESTORATION)
2105 NH,	NEFFI, (PENOBSCOT)	1992	250000	E EGGS	RI, RIDFW	1992	250000	E EGGS	PAWCATUCK R (RESTORATION)
3006 MA,	N ATTLEBORO H (MERRIMAC R)	1993	77300	FRY	RI, RIDFW	1993	77300	FRY	PAWCATUCK R (RESTORATION)
3007 NH,	NASHUA H (MERRIMAC R)	1993	4000	PARR	RI, RIDFW	1993	4000	PARR	PAWCATUCK R (RESTORATION)
3008 VT,	WHITE RIVER H (ST JOHN R) (DOM)	1993	42000	FRY	RI, RIDFW	1993	42000	FRY	PAWCATUCK R (RESTORATION)
3009 MA,	N ATTLEBORO H (MERRIMAC R)	P1994	800000	FRY	RI, RIDFW	P1994	800000	FRY	PAWCATUCK R (RESTORATION)
3010 VT,	WHITE RIVER H (ST JOHN R) (DOM)	1993	3000	PARR	RI, RIDFW	1993	3000	PARR	PAWCATUCK R (RESTORATION)
3011 NH,	NE FISH FARMS (ST JOHN R) (DOM)	1993	7000	PARR	RI, RIDFW	1993	7000	PARR	PAWCATUCK R (RESTORATION)
3012 NH,	NE FISH FARMS (ST JOHN R) (DOM)	1993	245000	FRY	RI, RIDFW	1993	245000	FRY	(RESTORATION)
SALMO TRUTTA [BROWN TROUT]									
3014 VA,	PAINT BANK FCS (CRAWFORD, DOM)	1993	20000	EGGS	RI, PERRYVILLE TROUT H (HISTORY OF BF)				
SALVELINUS FONTINALIS [BROOK TROUT]									
3015 NY,	FERNWOOD TROUT H (DOMESTIC)	1993	50000	EGGS	RI, LAFAYETTE TROUT H (HISTORY OF BF)				
3016 ME,	PHILLIPS STATE FISH H (ASSINICA D)	1992	39000	EGGS	RI, LAFAYETTE TROUT H (HISTORY OF BF)				

SUMMARY OF SALMONID INTRODUCTIONS AND TRANSFERS, 1986-1995

VERMONT

FILE LOCATION	ORIGINAL SOURCE (STOCK/STRAIN)	TRANSFERS YEAR	NUMBER	STAGE	SPONSOR/FACILITY	(PURPOSE)	FINAL DISPOSITION YEAR	NUMBER	STAGE	LOCATION	(PURPOSE)
SALMO SALAR [ATLANTIC SALMON]											
3130 ME,	GREEN LAKE (PENOBSCOT)	1993	1000000	EGGS	VT, WHITE RIVER FISH CULTURE		P1994		FRY	CONNECTICUT RIVER	

NORTH AMERICAN COMMISSION

NAC(96)9

REQUEST FOR SCIENTIFIC ADVICE TO THE NAC SCIENTIFIC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

1. Provide an update of the inventory of the Introductions and Transfers of salmonids in the NAC Area and rivers flowing into the NAC Area in 1996. Advise on the deviations from the NAC Protocols.

2. Consolidate the NAC Protocols (NAC(92)24 and NAC(94)14), Parts I and IV to one part and reduce ambiguity. The timetable for a re-write of the Protocols is as follows:

   i) A progress report and recommended changes to the Protocols should be presented to NAC at its annual meeting in June 1997.

   ii) Revised Protocols document would be tabled for adoption at the Annual Meeting of NAC in June, 1998.

3. The Working Group is requested to investigate the latest genetic and fish health scientific information, including recommendations from the 1995/96 Report of Activities of the Scientific Working Group (NAC(96)6) and information presented at the ICES/NASCO symposium in April, 1997 and advise the North American Commission as to their applicability.

ANNEX 6

COUNCIL

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

1. With respect to Atlantic salmon in the North Atlantic area:

   1.1 provide an overview of salmon catches, including unreported catches, and production of farmed and ranched salmon in 1996;
   1.2 report on significant developments which might assist NASCO with the management of salmon stocks;
   1.3 describe the causes of long-term changes in sea-age composition of salmon stocks;
   1.4 describe the causes of changes in abundance of salmon with special reference to changes in natural mortality and ocean climate;
   1.5 review the development of assessments and management advice from the perspective of the precautionary approach;
   1.6 provide a compilation of microtag, finclip and external tag releases by ICES member countries in 1996.

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

   2.1 describe the events of the 1996 fisheries and the status of the stocks;
   2.2 update the evaluation of the effects on stocks and homewater fisheries of the suspension of commercial fishing activity at Faroes since 1991;
   2.3 develop age specific spawning targets;
   2.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   2.5 evaluate the potential by-catch of post-smolts in pelagic fisheries;
   2.6 identify relevant data deficiencies and research requirements.

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

   3.1 describe the events of the 1996 fisheries and the status of the stocks;
   3.2 update the evaluation of the effects on US and Canadian stocks and fisheries of quota management and closures implemented after 1991 in the Canadian commercial salmon fisheries;
   3.3 update age specific spawning targets based on new information as available;
   3.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   3.5 provide multi-year projections of salmon abundance;
   3.6 identify relevant data deficiencies and research requirements.

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

   4.1 describe the events of the 1996 fisheries and the status of the stocks;
   4.2 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   4.3 identify relevant data deficiencies and research requirements.

ANNEX 7

LIST OF NORTH AMERICAN COMMISSION PAPERS

Paper No.	Title
NAC(96)1	Provisional Agenda
NAC(96)2	Draft Agenda
NAC(96)3	Election of Officers
NAC(96)4	Draft Report of the Thirteenth Annual Meeting
NAC(96)5	The St Pierre et Miquelon Salmon Fisheries
NAC(96)6	Report of Activities 1995/96, NAC Scientific Working Group on Salmonid Introductions and Transfers
NAC(96)7	Proposal by the United States for the Mixed Stock Fishery in the North American Commission Area for the Years 1996 and 1997
NAC(96)8	Request for Scientific Advice from the NAC Scientific Working Group on Salmonid Introductions and Transfers
NAC(96)9	Request for Scientific Advice to the NAC Scientific Working Group on Salmonid Introductions and Transfers
NAC(96)10	Agenda
NAC(96)11	Report on the Thirteenth Annual Meeting
CNL(96)15	Report of the ICES Advisory Committee on Fishery Management
CNL(96)58	Request for Scientific Advice from ICES

NOTE: This is a listing of all the Commission papers. Some, but not all, of these papers are included in this report as annexes.

REPORT OF THE

THIRTEENTH ANNUAL MEETING

OF THE

NORTH-EAST ATLANTIC COMMISSION

10-14 JUNE 1996
GOTHENBURG, SWEDEN

CHAIRMAN:	MR PEKKA NISKANEN (EU)
VICE-CHAIRMAN:	MR ERNESTO PENAS (EU)
RAPPORTEUR:	MR PER IVAR BERGAN (NORWAY)
SECRETARY:	DR MALCOLM WINDSOR

NEA(96)9

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NEA(96)9

REPORT OF THE THIRTEENTH ANNUAL MEETING OF THE NORTH-EAST ATLANTIC COMMISSION 10-14 JUNE 1996, SWEDISH EXHIBITION & CONGRESS CENTRE, GOTHENBURG, SWEDEN

1. OPENING OF THE MEETING

1.1 The Thirteenth Annual Meeting of the North-East Atlantic Commission was opened by the Chairman, Mr Pekka Niskanen (EU), who welcomed delegates to Gothenburg.

1.2 A list of participants at the Thirteenth Annual Meeting of the Council and Commissions is included on page 191 of this document.

2. ADOPTION OF THE AGENDA

2.1 The Commission adopted its agenda, NEA(96)11 (Annex 1) having reversed the order of items 5 and 6 on the draft agenda.

3. NOMINATION OF A RAPPORTEUR

3.1 The Commission nominated Mr Per Ivar Bergan (Norway) as its Rapporteur for the meeting.

4. ELECTION OF OFFICERS

4.1 The Commission re-elected Mr Pekka Niskanen (European Union) as Chairman.

4.2 The Commission elected Dr Alexander Zelentsov (Russian Federation) as Vice-Chairman.

5. REVIEW OF THE 1995 FISHERY AND ACFM REPORT FROM ICES ON SALMON STOCKS IN THE COMMISSION AREA

5.1 The representative of Denmark (in respect of the Faroe Islands and Greenland) advised the Commission that there had been no commercial fishery at Faroes in 1995 but that there had been a small catch in the research fishery.

5.2 The Chairman of the ACFM, Mr Eskild Kirkegaard, presented the scientific advice from ICES relevant to the North-East Atlantic Commission, CNL(96)15, prepared in response to a request from the Commission at its Twelfth Annual Meeting. The ACFM report from ICES, which contains the scientific advice relevant to all Commissions, is included on page 149 of this document.

5.3 The representative of the European Union thanked the Chairman of the ACFM for the report and referred to the fact that while there are few rivers in the North-East Atlantic Commission area for which a minimum biologically acceptable level (MBAL) reference point has been established the advice from ICES appeared to be for the

whole North-East Atlantic area. The advice also applies to in-river fisheries. The European Union is working towards establishing targets in a number of rivers and he asked if it was appropriate for changes in catch levels and juvenile surveys to be used as reference levels for management of homewater fisheries. The Chairman of the ACFM indicated that MBAL reference points have only been established on seven rivers in the Commission area, and on rivers where MBAL reference points cannot be clearly defined, all available information to indicate changes in stock status, such as trends in smolt and adult counts, should be used. The representative of Norway indicated that a detailed register of all Norwegian salmon rivers has been established which provides reasonable information on the status of stocks. The Chairman of the ACFM indicated that for the North-East Atlantic area there is a lack of detailed biological information for individual rivers which could be used to establish reference points for stocks.

5.4 The representative of the Russian Federation expressed great concern at the downward trend in pre-fishery abundance and referred to Russian statistics which showed that a similar situation existed in the 1930s, a period of unregulated salmon fishing. He suggested that while the reasons for the present decline were unknown, unregulated fishing in the sea could be responsible and there is a need, therefore, to consider the measures needed to improve the status of stocks.

5.5 The Chairman of the ACFM presented a graph showing the continent of origin of catches at Greenland. He indicated that there was no clear trend in the proportions of European and North American origin fish at West Greenland. If there had been different trends in abundance in the stocks from Europe and North America changes in the proportion of stocks at West Greenland might have been expected assuming there had been no change in migration patterns. The graph showed that, if anything, the North American proportion had increased.

6. RESEARCH FISHING IN THE COMMISSION AREA

6.1 Dr Lars Petter Hansen (Norway) presented a report to the Commission on a research fishing project conducted to the north-west of the Hebrides and in the Northern Norwegian Sea during 1995. Catches of up to 23 post-smolts had been made during 30-minute surface trawls and Dr Hansen indicated that he believed this represented a breakthrough in sampling post-smolts at sea. The results indicate high growth rate, and age analysis of the post-smolts in the northern areas suggests that a relatively high proportion of smolts from this area originated from southern European rivers. A small number of adult salmon, many of which were fish farm escapes, was also caught.

6.2 The representative of the Russian Federation asked whether it was possible to provide estimates of the abundance of smolts in the area surveyed. Dr Hansen replied that only a limited amount of research had been carried out, amounting to approximately two vessel months and it was not, therefore, possible to estimate abundance at this stage.

6.3 The representative of Iceland asked if there was any evidence that salmon are caught in the large trawls used for other species since in the past evidence had been provided to NASCO which indicated that salmon had been caught in fisheries for mackerel and horse mackerel. The representative of Denmark (in respect of the Faroe Islands and

Greenland) referred to surveys in the Norwegian Sea using mid-water trawls and although the shallowest of these trawls had been at a depth of only 50m no salmon had been caught. The representative of the ACFM indicated that occasional salmon have been taken in pelagic trawls in the Baltic Sea. He stressed that it was important to ensure that trawls intended to catch salmon during research fishing fish the uppermost layers of the ocean. Even a depth of 1 metre of water above the net would result in the fish escaping capture.

7. ENVIRONMENTAL QUALITY OF SALMON RIVERS

7.1 The Chairman asked if any new information was available on *Gyrodactylus salaris* or any other matter regarding the environmental quality of salmon rivers. The representative of Norway referred to the returns made under Article 15 of the Convention which had been presented to the Council and which provided a detailed description of developments in Norwegian rivers.

8. REPORT OF THE AD HOC WORKING GROUP ON SALMONID INTRODUCTIONS AND TRANSFERS

8.1 At its Twelfth Annual Meeting the Commission had considered the report of its Working Group on Introductions and Transfers. The Commission had welcomed the report and adopted a document, NEA(95)12, which had been prepared by the European Union based on the recommendations of the Working Group. It had been recognised that further work was needed on the classification of rivers and development of management measures and on the concept of zones designed to reduce the spread of unknown diseases and parasites. The issue of transgenic salmon had also been left unresolved by the Working Group. In 1995, the Commission had agreed that work on these areas should be undertaken by an Ad Hoc Working Group to be chaired by the Secretary.

8.2 The Secretary introduced the report of the Ad Hoc Working Group on Introductions and Transfers, NEA(96)5 (Annex 2). This Group had met in Brussels during 14 and 15 March 1996 and had formulated recommendations on the three issues which remained unresolved. The Ad Hoc Working Group had proposed that its recommendations be incorporated into the earlier document, NEA(95)12, adopted by the Commission in 1995. This document could then form the basis of an agreement, resolution or guidelines to be adopted by the Commission.

8.3 The Commission considered document NEA(96)6 (Annex 3) prepared by the Secretary which was based on NEA(95)12 but included the recommendations of the Ad Hoc Working Group. The representative of the European Union tabled document NEA(96)7 (Annex 4) which proposed a revised wording for paragraph 5(b) of document NEA(96)6. The representative of Norway indicated that the wording in NEA(96)7 was acceptable but specific reference to the World Trade Organization agreement and the Sanitary and Phytosanitary Code created some difficulties. He would prefer a more general wording along the lines of "already existing international agreements regarding environment, living organisms and trade". The representative of the European Union confirmed that this form of wording was acceptable to his delegation.

8.4 The representative of the European Union indicated that there was also a need for some revision to the second paragraph of document NEA(96)6. The representative of Norway indicated that he also had some minor additional comments on the report. The Chairman proposed that the Parties should send amendments to the Secretary with a view to adopting the report as soon as possible by correspondence.

8.5 The representative of the European Union suggested that a representative of the World Trade Organization be invited to address the Commission on trade issues at its next annual meeting. The representative of Norway proposed that representatives from other relevant organizations dealing with international agreements, such as the Biodiversity Convention, should also be invited. The Commission agreed to this proposal.

9. REGULATORY MEASURES

9.1 The representative of Norway drew attention to the general decline in salmon stocks as identified in the report from ICES and stated that the number of stocks threatened with loss in Norway has increased. He referred to the clear advice from ICES indicating the need for a reduction in the level of fishing mortality and this advice, together with the concerns about Norwegian stocks, should be taken into account in deciding on a regulatory measure for the Faroese fishery. The representative of the Russian Federation stated that his delegation would be able to accept a continuation of research fishing at Faroes but wished to see a reduction in the quota. The representative of Denmark (in respect of the Faroe Islands and Greenland) stated that he believed that the quota should be maintained at its present level since he could see no biological reason for a reduction. The representative of the European Union referred to the decline in the abundance of salmon stocks and indicated that there was a need for a substantial reduction in the quota. The representative of Iceland stated that the Icelandic position remained that there should be no fishing for salmon at sea.

9.2 The Commission considered a Proposal from the Chair for a regulatory measure for fishing for salmon in the Faroe Islands in the calendar year 1997, NEA(96)8 (Annex 5). Upon a vote, Denmark (in respect of the Faroe Islands and Greenland), the European Union, Norway and the Russian Federation voted in favour of the proposal. Iceland abstained from the vote. The regulatory measure was therefore adopted.

9.3 The representative of Denmark (in respect of the Faroe Islands and Greenland) stated that he had voted for the proposal with some hesitation. However, as an interim measure while waiting for detailed catch advice, he had been able to accept it. He informed the Commission that if fishery licences are granted in 1997 the Home Government of the Faroe Islands intends to allocate not more than 360 tonnes of the quota. The Faroese Home Government would further seek to reduce their fishery effort by 7 days in April 1997 and by 7 days in December 1997 and to restrict the total to 1150 fishing days in 1997. By taking these measures the representative of Denmark (in respect of the Faroe Islands and Greenland) trusted that the Commission would appreciate that they had taken the maximum steps which their fishermen and administration could live with. The reductions have been approximately 30% last year and now an additional 10% approximately. These steps must be considered as their final efforts. They would now wait to see what comparable measures would be taken

by other members in their common efforts to safeguard the Atlantic salmon stocks. The results of scientific research now being carried by several member states are awaited with great interest as is the scientific advice that the results of such research will provide.

10. RECOMMENDATIONS TO THE COUNCIL ON THE REQUEST TO ICES FOR SCIENTIFIC ADVICE

10.1 The Secretary advised the Commission that Mr Kjartan Hoydal (Denmark (in respect of the Faroe Islands and Greenland)) was not attending the Thirteenth Annual Meeting and the Commission would therefore need to elect a new member of the Standing Scientific Committee. The Commission elected Mr Jan Arge Jacobsen (Denmark (in respect of the Faroe Islands and Greenland)) to represent the Commission on the Standing Scientific Committee with Dr Lars Petter Hansen (Norway).

10.2 The Commission reviewed document SSC(96)6 and agreed to recommend it to the Council as part of the annual request to ICES for scientific advice. The request to ICES agreed by the Council, CNL(96)58, is contained in Annex 6.

11. ANNOUNCEMENT OF THE TAG RETURN INCENTIVE SCHEME PRIZE

11.1 The Chairman announced that the draw for prizes in the Tag Return Incentive Scheme was made by the Auditors at NASCO Headquarters on 31 May 1996. The winner of the Commission's prize was Mr Brian Dyer, Pontypridd, Wales. The Commission offered its congratulations to the winner.

12. OTHER BUSINESS

12.1 The representative of the European Union stated that the European Union delegation is concerned about the adverse effect of fish farming on wild salmon stocks since escapees can spread diseases and parasites and cause genetic damage. In 1994 NASCO adopted the Oslo Resolution which contains important measures to safeguard the wild stocks. Salmon farming should not be conducted too close to major salmon rivers. The European Union is concerned about the high density of farms and the proportion of escapees in Northern Europe.

13. DATE AND PLACE OF NEXT MEETING

13.1 The Commission agreed to hold its next meeting during the Fourteenth Annual Meeting of the Council, 9-13 June 1997, in Ilulissat, Greenland.

14. CONSIDERATION OF THE DRAFT REPORT OF THE MEETING

14.1 The Commission agreed the draft report of the meeting, NEA(96)4.

ANNEX 1

NEA(96)11
THIRTEENTH ANNUAL MEETING OF THE
NORTH-EAST ATLANTIC COMMISSION
10-14 JUNE 1996
SWEDISH EXHIBITION & CONGRESS CENTRE, GOTHENBURG, SWEDEN

AGENDA

1. Opening of the Meeting
2. Adoption of the Agenda
3. Nomination of a Rapporteur
4. Election of Officers
5. Review of the 1995 Fishery and ACFM Report from ICES on Salmon Stocks in the Commission Area
6. Research Fishing in the Commission Area
7. Environmental Quality of Salmon Rivers
8. Report of the Ad Hoc Working Group on Salmonid Introductions and Transfers
9. Regulatory Measures
10. Recommendations to the Council on the Request to ICES for Scientific Advice
11. Announcement of the Tag Return Incentive Scheme Prize
12. Other Business
13. Date and Place of Next Meeting
14. Consideration of the Draft Report of the Meeting

ANNEX 2

NORTH-EAST ATLANTIC COMMISSION

NEA(96)5

REPORT OF THE NORTH-EAST ATLANTIC COMMISSION AD HOC WORKING GROUP ON INTRODUCTIONS AND TRANSFERS OF SALMONIDS

1. In 1994 the Commission established a Working Group to advise on the adequacy of existing controls concerning introductions and transfers and to make recommendations for strengthened controls and other measures if necessary. The report of this Working Group was presented during the Twelfth Annual Meeting and was welcomed by the Commission. A document based on the recommendations of the Working Group, NEA(95)12, was adopted. It was, however, recognised that further work was needed on the classification of rivers and development of management measures and on the concept of zones designed to reduce the spread of unknown diseases and parasites. Another issue which was not resolved in document NEA(95)12 was the question of transgenic fish. The Commission agreed that work on these areas should be undertaken by the Secretary and if necessary by an Ad Hoc Working Group to be chaired by the Secretary.

2. Following consultations with the Parties it became clear that the remaining matters could not be resolved by correspondence and at the invitation of the European Union, the Ad Hoc Working Group met in Brussels during 14 and 15 March. Its report to the Commission is attached. This report contains the recommendations which the Ad Hoc Working Group has made and which, together with the recommendations in NEA(95)12, could form the basis for a Resolution or Guidelines on Introductions and Transfers, to be adopted by the Commission.

Secretary
Edinburgh
19 April 1996

NEA(96)5

REPORT OF THE AD HOC WORKING GROUP ON INTRODUCTIONS AND TRANSFERS OF SALMONIDS 14/15 MARCH 1996, DIRECTORATE GENERAL OF FISHERIES, EUROPEAN COMMISSION, BRUSSELS

1. Opening of the Meeting

1.1 The Chairman of the Ad Hoc Working Group opened the meeting, welcomed the delegates to Brussels and expressed his gratitude to the Directorate General of Fisheries for agreeing to host the meeting. He referred to the progress made by the Working Group on Introductions and Transfers of Salmonids and to the fact that a document, NEA(95)12, based on the recommendations of this Working Group had been adopted at the Twelfth Annual Meeting of the North-East Atlantic Commission. It had been recognised by the Commission that introductions and transfers pose genetic, ecological and disease and parasite risks to the wild stocks and that to protect these stocks there was a need for measures stronger than those at present in force. The Chairman referred to three items of business which had not been resolved by the Commission - the development of a system of classification of salmon rivers and appropriate management measures, definition of zones to reduce the spread of unknown diseases and parasites and the question of transgenic fish. It was these three issues that the Ad Hoc Working Group was now asked to resolve. In considering these issues there was bound to be conflict between respecting other international obligations and the risks of damaging the wild stocks, but the Chairman stressed that NASCO's role could only be to propose the necessary measures to safeguard the wild stocks while the trade issues would be resolved in other fora, hopefully taking into account NASCO's concerns.

1.2 A list of participants is given in Appendix 1.

2. Adoption of the Agenda

2.1 The Ad Hoc Working Group adopted its agenda, IAT(96)7 (Appendix 2) having reversed the order of items 4 and 5 on the draft agenda. The Chairman indicated that the North East-Atlantic Commission had already agreed a report, NEA(95)12, which dealt with a number of issues but that the Ad Hoc Working Group might best proceed by proposing wording to deal with the three outstanding issues referred to in paragraph 1.1 above.

3. Consideration of the Terms of Reference

3.1 The Ad Hoc Working Group adopted its Terms of Reference, IAT(96)2 (Appendix 3).

3.2 The Group discussed its approach to the salmon conservation actions which might be taken by NASCO in the light of the agreement establishing the World Trade Organization, legislation of the European Community and the Convention on Biological Diversity. It became clear that the conflict between the demands of international trade obligations and the protection of the wild stocks is a real one. It

reached the view that existing international agreements on trade did not give due weight to the conservation needs of wild stocks, in particular the risk posed to them by introductions and transfers from other areas. There needs to be compatibility between the obligations to NASCO to conserve wild salmon stocks and other international trade obligations.

3.3 This raised difficult issues of principle on which there was a range of views and the Ad Hoc Working Group decided that the best way that progress might be made would be to identify the risks to wild salmon stocks and prioritise the steps that could be taken to assist their conservation; these factors could then be taken into account by the Parties in formulating policies on salmon conservation and international trade.

4. Development of criteria for defining zones to reduce the spread of diseases and parasites

4.1 The Ad Hoc Working Group reviewed the options for defining zones to reduce the spread of unknown diseases and parasites, IAT(96)4.

4.2 The Ad Hoc Working Group recommends the strengthening of procedures for the early identification and detection of, and rapid response to, an outbreak of any serious disease or parasitic infection likely to affect Atlantic salmon. These procedures should include the establishment of official surveillance services responsible for the monitoring of the health of both wild and farmed fish. The procedures should also demand the rapid introduction of restrictions on the movement of salmonids in the case of an outbreak of a disease or parasitic infection until the status of the disease or parasitic infection is known.

4.3 However, it is recognised that even with such procedures it may not be possible to respond in time to prevent the spread of such an infection. The following measures would offer protection to the wild stocks from outbreaks of diseases and parasites and deserve further consideration by the North-East Atlantic Commission and the Parties:

Establishment of zones: the intention of such zones, which might be defined using geographical, climatic or biological criteria, is to limit the spread of parasites and diseases. The Ad Hoc Working Group felt that such zones would be a positive factor in protecting against the spread of diseases and parasites to the wild stocks but recognised that to be compatible with existing international obligations such zones would have to be based on an analysis of the risks involved. The Ad Hoc Working Group advocates that the Parties explore and take full advantage of the opportunities in the many international agreements to protect the wild stocks. If these prove to be insufficient the necessary steps should be taken by the Parties in formulating policy on salmon conservation and international trade.

Movements of salmonids: the risks of spreading diseases and parasites is less in the case of movements of eggs than for movements of live salmonids which in the past have led to the transmission of serious diseases and parasites to the wild stocks. The Ad Hoc Working Group recommends that where there are movements the use of salmonid eggs is safer and therefore desirable.

Diseases of wild fish: there is a need to strengthen and amend disease controls to take full account of the special situation of wild fish.

5. Classification of rivers in the North-East Atlantic Commission Area and development of appropriate Management Measures

5.1 The Ad Hoc Working Group considered that it would be very useful to have an agreed classification system for salmon rivers flowing into the North Atlantic together with an indication of the factors which should be taken into account in developing management measures for each class. The Working Group agreed that a suitable classification should be based on the NASCO Salmon Rivers Database but with grouping of certain categories as follows:

Group 1 Rivers: Rivers with no self-sustaining salmon stock.

Group 2 Rivers: Rivers in which there is a self-sustaining salmon stock.

Group 3 Rivers: Rivers in which there is a self-sustaining salmon stock which is considered to be in a pristine condition or which is considered to be of particular value.

Note:

Group 1 Rivers would be based on Categories 1 and 2 of the rivers database and Group 2 and 3 Rivers would be based on Categories 3, 4 and 5 of the Rivers database.

5.2 In developing measures appropriate to each class of river the Ad Hoc Working Group recognised that local conditions would be a very significant factor in determining which management measures would be appropriate. Nevertheless there were certain factors which should be taken into account for each class of river and these are listed below:

Group 1 Rivers - Rivers with no self-sustaining salmon stock

Factors to be considered in developing management measures:

1. It is desirable to create conditions in rivers which are known to have lost their salmon stock which would allow the re-establishment of a self-sustaining stock of Atlantic salmon.

2. The use of hatchery-reared salmonids for enhancement is acceptable provided that these do not pose a threat to neighbouring rivers in a higher group or to other species of fish in the same river.

Group 2 Rivers - Rivers in which there is a self-sustaining salmon stock

Factors to be considered in developing management measures:

1. The establishment of new programmes for the introduction of non-indigenous fish species or Atlantic salmon stocks (other than those referred to in paragraph 2) is to be avoided.

2. Hatchery regimes, where these are considered necessary for enhancement purposes, should utilise stocks from the same river. Where this is not possible a stock from a neighbouring river with similar ecological characteristics and salmon of similar biological characteristics could be permitted.

3. There is a need to ensure that, in establishing broodstocks for use in hatcheries, adequate spawning populations are maintained in the donor area.

4. It is desirable that hatchery stocks intended for release are held separately from stocks to be used in farming.

Group 3 Rivers - Rivers in which there is a self-sustaining salmon stock which is considered to be in pristine condition or which is considered to be of particular value

In these rivers there should be as little interference by man as possible. Management actions should be restricted to measures necessary to address existing factors, and those which arise in future, which might have an adverse impact on the stocks.

5.3 For all groups of rivers the development of salmon aquaculture shall be in accordance with the Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimise Impacts from Salmon Aquaculture on the Wild Salmon Stocks agreed at the Eleventh Annual Meeting of the Council of NASCO in Oslo in 1994. The environmental impact assessment conducted prior to licensing of salmonid farms should pay particular attention to the potential impacts on the wild stocks.

6. Consideration of a Draft Resolution or Draft Guidelines on Introductions and Transfers of Salmonids

6.1 The third issue left unresolved in document NEA(95)12 was the question of genetically modified fish. Genetically modified fish have been defined as fish in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. This definition includes transgenic fish, i.e. fish into which genes have been introduced from another organism, but does not include triploid or tetraploid fish. All the Parties agreed that transgenic salmonids, which are now being marketed for use in aquaculture, pose a major threat to the wild stocks. There are concerns about the effects of the transmission of transplanted genes to the wild stocks through interbreeding and the ecological effects of transgenic fish both in the marine and freshwater environments. Where transgenic fish exhibit substantially altered performance there is concern that they could destabilise aquatic ecosystems. The Ad Hoc Working Group believes that there would inevitably be an interaction of some kind with the wild stocks and with the environment since the use of transgenic salmonids in farming based on existing technologies would inevitably result in escape to the wild.

6.2 Within the European Economic area, the release of transgenic salmonids to the environment (including their use in aquaculture) is covered by Directive 90/220. This Directive, it was noted, contains a requirement for the Member States concerned to undertake a risk assessment, which must then be submitted to all other Member States who can object. In the event of an objection being received, then the matter would be determined by a Committee composed of the representatives of the Member States. The Parties also noted that EU Directive 90/220 is currently under review. They felt that it was important that NASCO should submit its views to the EU as part of that review to the effect that:

- NASCO, along with any other international organizations dealing with wild stocks, should be consulted formally as part of the review process;

- in the event of a Member State proposing the release of transgenic salmonids, NASCO should be a consultee under Article 7 of Directive 90/220.

6.3 The Norwegian position was that any properly conducted risk assessment (as required by the Norwegian authorities) would inevitably show that the release of transgenic salmonids poses risks. These risks include interactions with wild stocks and with the environment. On that basis, Norway and Iceland believe that transgenic salmonids should not be permitted in the Commission area except in secure, self-contained facilities. Russia was also of the opinion that it was unsafe to permit releases of such fish.

6.4 The Ad Hoc Working Group, while recognising this difference in approach by the member Parties, stressed that such releases posed severe risks to the wild stocks. When conducting any risk assessment, the threats to the wild stocks should be recognised and there should be a strong presumption against any activity which would risk the introduction of transgenic salmonids to the wild.

6.5 The Ad Hoc Working Group urged the Commission to seek wider agreement covering the whole North Atlantic area on this issue.

6.6 In summary, the Ad Hoc Working Group suggests that document NEA(95)12 or its successor be amended as follows:

Paragraph 4 should be worded according to paragraphs 6.1 - 6.5 of this report.

Paragraph 5(b) should be worded according to paragraph 4.2 - 4.3 of this report.

Paragraph 7 should be worded according to paragraphs 5.1 - 5.3 of this report.

7. Other Business

7.1 There was no other business.

8. Consideration of the Report of the Meeting

8.1 The Ad Hoc Working Group agreed the report of the meeting.

Appendix 1

MEETING OF THE NORTH-EAST ATLANTIC COMMISSION AD HOC WORKING GROUP ON INTRODUCTIONS AND TRANSFERS OF SALMONIDS

BRUSSELS, 14/15 MARCH 1996

LIST OF PARTICIPANTS

* Denotes Head of Delegation

EUROPEAN UNION

*MR ANDREW THOMSON	Commission of the European Communities, Brussels
MR RICHARD BATES	Commission of the European Communities, Brussels
MR JOHN BROWNE	Department of the Marine, Dublin
MR WILLEM DAELMAN	Commission of the European Communities, Brussels
MR DAVID R DICKSON	Scottish Office Agriculture, Environment and Fisheries Department, Edinburgh
MR DAVID A DUNKLEY	Scottish Office Agriculture, Environment and Fisheries Department, Edinburgh
MR ALAN GRAY	Commission of the European Communities, Brussels
MS KAJSA HAKULIN	Ministry of Agriculture and Forestry, Helsinki
DR BO HOLMBERG	National Board of Fisheries, Gothenburg
MR IVOR LLEWELYN	Ministry of Agriculture, Fisheries and Food, London
MR PEKKA NISKANEN	Ministry of Agriculture and Forestry, Helsinki
MR ALESSANDRO PICCIOLI	Commission of the European Communities, Brussels
MR TED POTTER	Ministry of Agriculture, Fisheries and Food, Lowestoft
MR JOSE A SANCHEZ-PRADO	University of Oviedo, Oviedo
MR MICHAEL WALDRON	Secretariat General of the Council of the European Union, Brussels

ICELAND

*MR ARNI ISAKSSON	Institute of Freshwater Fisheries, Reykjavik

NORWAY

*MR HELGE LORENTZEN	Ministry of the Environment, Oslo
MR NILS OLE BAALSRUD	Ministry of Agriculture, Oslo
MR ØYVIND WALSØ	Directorate for Nature Management, Trondheim

RUSSIAN FEDERATION

*DR ALEXANDER ZUBCHENKO	PINRO, Murmansk
MS VALENTINA V VOLKOVA	PINRO, Murmansk

SECRETARIAT

DR MALCOLM WINDSOR	Secretary
DR PETER HUTCHINSON	Assistant Secretary

Appendix 2

IAT9607

NORTH EAST ATLANTIC COMMISSION

AD HOC WORKING GROUP ON INTRODUCTIONS AND TRANSFERS OF SALMONIDS

Ground Floor Meeting Room
European Commission, Directorate-General of Fisheries
Rue Joseph II, no. 99
Brussels, Belgium

14/15 March 1996

A G E N D A

1. Opening of the Meeting
2. Adoption of the Agenda
3. Consideration of the Terms of Reference
4. Development of criteria for defining zones to reduce the spread of diseases and parasites
5. Classification of rivers in the North-East Atlantic Commission Area and development of appropriate Management Measures
6. Consideration of a Draft Resolution or Draft Guidelines on Introductions and Transfers of Salmonids
7. Other Business
8. Consideration of the Report of the Meeting

IAT(96)2

TERMS OF REFERENCE

At its Tenth Annual Meeting the North-East Atlantic Commission decided in principle to convene a Working Group to look at the possibility of developing agreements concerning introductions and transfers. This Working Group met twice during November 1994 and March 1995, and its report was presented to the North-East Atlantic Commission at its Twelfth Annual Meeting in Glasgow in June 1995. The Commission welcomed this report but recognised that further work was needed on the classification of rivers and development of relevant measures for the different classes so as to protect wild stocks, and on the concept of zones designed to reduce the spread of unknown diseases and parasites. The Commission adopted a document, NEA(95)12, based on the recommendations of the Working Group, in which it was proposed that an Ad Hoc Working Group on Introductions and Transfers be established so as to allow completion of the work. On the basis of this document and the deliberations within the North-East Atlantic Commission, the Ad Hoc Working Group's Terms of Reference are as follows:

"That an Ad Hoc Working Group, chaired by the Secretary, be established:

(1) To review the suitability of the descriptive classes used in the NASCO rivers database as a classification system that could be used as a basis for the application of relevant measures for different river classes;

(2) To develop management measures, for each class of river which are designed to safeguard the wild stocks from salmonid introductions and transfers;

(3) To review and propose appropriate criteria for defining zones designated to reduce the spread of diseases and parasites;

(4) To prepare a draft Resolution on Guidelines on Introductions and Transfers of Salmonids based on the recommendations contained in document NEA(95)12 and the measures developed by the ad hoc Working Group referred to in paragraphs (1)-(3) above. This draft Resolution will be presented to the North-East Atlantic Commission at its Thirteenth Annual Meeting".

The Ad Hoc Working Group is asked to consider these Terms of Reference with a view to their adoption.

ANNEX 3

NORTH-EAST ATLANTIC COMMISSION

NEA(96)6

INTRODUCTIONS AND TRANSFERS

NEA(96)6

INTRODUCTIONS AND TRANSFERS

1. The North-East Atlantic Commission, having considered evidence of the damage that can be done to wild salmon stocks by introductions and transfers, recognised that such movements pose genetic, ecological and disease and parasite risks to the wild Atlantic salmon. It is clear that such damage can be so severe as to render certain wild salmon stocks extinct. The fact that diseases and parasites have been first introduced and then spread into other areas previously unaffected strongly suggests the inadequacy of the arrangements existing at the time, whether that be because of the nature of those arrangements or because of lack of implementation. In recent years there has been a strengthening of legislation although the measures are of a different nature depending on the Contracting Parties.

2. The North-East Atlantic Commission came to the view that, to protect wild salmon stocks, there should be measures stronger than those at present in force. The Commission looked at a number of options for making conservation of the wild stocks more assured and, subject to reservations on the implementation of some of the measures which may be incompatible with existing legislation, the Parties agreed, in principle, on the guidelines below. The Parties agreed to implement the measures in the proposed guidelines as soon as practicable and to present the guidelines in an appropriate form for formal approval before or at the next meeting of the Commission. (These proposed guidelines do not apply to the use of introductions or transfers for research purposes provided that fish moved for such purposes are held in secure quarantine facilities.) The proposed guidelines are complementary to the recommendations on salmon farming, ranching and enhancement in the Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimise Impacts from Salmon Aquaculture on the Wild Salmon Stocks (CNL(94)53) adopted by the Council in 1994.

3. **Movements originating from outside the North-East Atlantic Commission Area**

Movements into the Commission area of live Atlantic salmon and their eggs which have originated from outside the Commission area should not be permitted.

4. **Transgenic Atlantic salmon**

4.1 Genetically modified fish have been defined as fish in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. This definition includes transgenic fish, i.e. fish into which genes have been introduced from another organism, but does not include triploid or tetraploid fish. All the Parties agreed that transgenic salmonids, which are now being marketed for use in aquaculture, pose a major threat to the wild stocks. There are concerns about the effects of the transmission of transplanted genes to the wild stocks through interbreeding and the ecological effects of transgenic fish both in the marine and freshwater environments. Where transgenic fish exhibit substantially altered performance there is concern that they could destabilise aquatic ecosystems. The North-East Atlantic Commission believes that there would inevitably be an interaction of some kind with the wild stocks and with the environment since the use of

transgenic salmonids in farming based on existing technologies would inevitably result in escape to the wild.

4.2 Within the European Economic area, the release of transgenic salmonids to the environment (including their use in aquaculture) is covered by Directive 90/220. This Directive, it was noted, contains a requirement for the Member States concerned to undertake a risk assessment, which must then be submitted to all other Member States who can object. In the event of an objection being received, then the matter would be determined by a Committee composed of the representatives of the Member States. The Parties also noted that EU Directive 90/220 is currently under review. They felt that it was important that NASCO should submit its views to the EU as part of that review to the effect that:

- NASCO, along with any other international organizations dealing with wild stocks, should be consulted formally as part of the review process;

- in the event of a Member State proposing the release of transgenic salmonids, NASCO should be a consultee under Article 7 of Directive 90/220.

4.3 The Norwegian position was that any properly conducted risk assessment (as required by the Norwegian authorities) would inevitably show that the release of transgenic salmonids poses risks. These risks include interactions with wild stocks and with the environment. On that basis, Norway and Iceland believe that transgenic salmonids should not be permitted in the Commission area except in secure, self-contained facilities. Russia was also of the opinion that it was unsafe to permit releases of such fish.

4.4 The North-East Atlantic Commission, while recognising this difference in approach by the member Parties, stressed that such releases posed severe risks to the wild stocks. When conducting any risk assessment, the threats to the wild stocks should be recognised and there should be a strong presumption against any activity which would risk the introduction of transgenic salmonids to the wild.

4.5 The North-East Atlantic Commission recommends the development of a wider agreement covering the whole North Atlantic area on this issue.

5. Movements within the North-East Atlantic Commission Area

(a) *Specified diseases and parasites*

Mapping of the presence of serious diseases and parasites should be used to establish epidemiological zones, i.e. zones free of specific pathogens, covering the Commission area. Management measures within these zones should include monitoring to confirm the disease status of a zone and eradication. These zones should be established for at least the following diseases: Viral Haemorrhagic Septicaemia (VHS), Infectious Haematopoietic Necrosis (IHN), Infectious Salmon Anaemia (ISA) and the parasite *Gyrodactylus salaris.*

Movements of live salmonids and their eggs from a zone where any of the specified diseases is present to a zone free of these diseases should not be permitted. However,

movements of salmonid eggs should be permitted where there is no risk of transmission of the specified diseases or parasite.

(b) ***Unknown diseases and parasites***

The North-East Atlantic Commission recommends the strengthening of procedures for the early identification and detection of, and rapid response to, an outbreak of any serious disease or parasitic infection likely to affect Atlantic salmon. These procedures should include the establishment of official surveillance services responsible for the monitoring of the health of both wild and farmed fish. The procedures should also demand the rapid introduction of restrictions on the movement of salmonids in the case of an outbreak of a disease or parasitic infection until the status of the disease or parasitic infection is known.

However, it is recognised that even with such procedures it may not be possible to respond in time to prevent the spread of such an infection. The following measures would offer protection to the wild stocks from outbreaks of diseases and parasites and deserve further consideration by the North-East Atlantic Commission and the Parties:

Establishment of zones: the intention of such zones, which might be defined using geographical, climatic or biological criteria, is to limit the spread of parasites and diseases. The North-East Atlantic Commission felt that such zones would be a positive factor in protecting against the spread of diseases and parasites to the wild stocks but recognised that to be compatible with existing international obligations such zones would have to be based on an analysis of the risks involved. The North-East Atlantic Commission advocates that the Parties explore and take full advantage of the opportunities in the many international agreements to protect the wild stocks. If these prove to be insufficient the necessary steps should be taken by the Parties in formulating policy on salmon conservation and international trade.

Movements of salmonids: the risks of spreading diseases and parasites is less in the case of movements of eggs than for movements of live salmonids which in the past have led to the transmission of serious diseases and parasites to the wild stocks. The North-East Atlantic Commission recommends that where there are movements the use of salmonid eggs is safer and therefore desirable.

Diseases of wild fish: there is a need to strengthen and amend disease controls to take full account of the special situation of wild fish.

(c) ***Health Inspections of donor facilities***

Movements of live salmonids and their eggs from hatcheries to areas containing Atlantic salmon stocks, or to facilities where there is a risk of transmission of infection to such areas, should only take place from facilities where regular inspections have not detected significant diseases and parasites.

6. **Movements of Non-Indigenous Fish**

No non-indigenous fish should be introduced into a river containing Atlantic salmon without a thorough evaluation of the potential adverse impacts on the Atlantic salmon

population(s) which indicates that there are no risks of adverse ecological interactions. Where a decision is taken to proceed with the introduction of a non-indigenous species it should be carried out in accordance with the codes of practice developed by ICES and EIFAC.

Introductions of non-indigenous anadromous salmonids into the Commission area should not be permitted.

7. Classification of Rivers

7.1 The North-East Atlantic Commission considered that it would be very useful to have an agreed classification system for salmon rivers flowing into the North Atlantic together with an indication of the factors which should be taken into account in developing management measures for each class. The Commission agreed that a suitable classification should be based on the NASCO Salmon Rivers Database but with grouping of certain categories as follows:

Group 1 Rivers: Rivers with no self-sustaining salmon stock.

Group 2 Rivers: Rivers in which there is a self-sustaining salmon stock.

Group 3 Rivers: Rivers in which there is a self-sustaining salmon stock which is considered to be in a pristine condition or which is considered to be of particular value.

Note:

Group 1 Rivers would be based on Categories 1 and 2 of the rivers database and Group 2 and 3 Rivers would be based on Categories 3, 4 and 5 of the Rivers database.

7.2 In developing measures appropriate to each class of river the North-East Atlantic Commission recognised that local conditions would be a very significant factor in determining which management measures would be appropriate. Nevertheless there were certain factors which should be taken into account for each class of river and these are listed below:

Group 1 Rivers - Rivers with no self-sustaining salmon stock

Factors to be considered in developing management measures:

1. It is desirable to create conditions in rivers which are known to have lost their salmon stock which would allow the re-establishment of a self-sustaining stock of Atlantic salmon.

2. The use of hatchery-reared salmonids for enhancement is acceptable provided that these do not pose a threat to neighbouring rivers in a higher group or to other species of fish in the same river.

Group 2 Rivers - Rivers in which there is a self-sustaining salmon stock

Factors to be considered in developing management measures:

1. The establishment of new programmes for the introduction of non-indigenous fish species or Atlantic salmon stocks (other than those referred to in paragraph 2) is to be avoided.

2. Hatchery regimes, where these are considered necessary for enhancement purposes, should utilise stocks from the same river. Where this is not possible a stock from a neighbouring river with similar ecological characteristics and salmon of similar biological characteristics could be permitted.

3. There is a need to ensure that, in establishing broodstocks for use in hatcheries, adequate spawning populations are maintained in the donor area.

4. It is desirable that hatchery stocks intended for release are held separately from stocks to be used in farming.

Group 3 Rivers - Rivers in which there is a self-sustaining salmon stock which is considered to be in pristine condition or which is considered to be of particular value

In these rivers there should be as little interference by man as possible. Management actions should be restricted to measures necessary to address existing factors, and those which arise in future, which might have an adverse impact on the stocks.

7.3 For all groups of rivers the development of salmon aquaculture shall be in accordance with the Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimise Impacts from Salmon Aquaculture on the Wild Salmon Stocks agreed at the Eleventh Annual Meeting of the Council of NASCO in Oslo in 1994. The environmental impact assessment conducted prior to licensing of salmonid farms should pay particular attention to the potential impacts on the wild stocks.

8. Unintentional Introductions and Releases and Related Education and Information

The North-East Atlantic Commission is concerned at the impacts of unintentional introductions of aquatic species which may adversely affect wild salmon stocks. Such introductions and transfers can occur, for example, in ships' ballast water, with the use of containers for transport of fish, as a result of the release of live bait or on fishing equipment. It is recommended that steps should be taken to limit the risks from such unintentional introductions. To this end it recommends that the NASCO Secretariat produces educational material and other information to increase awareness of the risks.

Secretary
Edinburgh
10 June 1996

ANNEX 4

NORTH-EAST ATLANTIC COMMISSION

NEA(96)7

EUROPEAN UNION ALTERNATIVE WORDING TO REPORT OF NEAC AD HOC WORKING GROUP ON INTRODUCTIONS AND TRANSFERS

"4.3 However, it must be considered that even with such procedures, it may not be possible to respond in time to prevent the spread of such a disease or parasitic infection. Bearing in mind that possible additional measures must be compatible with already existing international agreements such as the agreement on WTO and in particular the SPS (Sanitary and Phytosanitary) agreement, the Ad Hoc Working Group therefore recommends that the contracting parties, when establishing or reviewing rules on transfers of fish, reflect about additional protective measures such as:

the establishment of zones: the intention of such zones, which might be defined using geographical climatic or biological criteria is to limit the spread of parasites and diseases to wild stocks,

the movement of salmonids: for disease prevention purposes, the trade in eggs is safer than the trade in live fish,

diseases of wild fish: there is a need to strengthen and amend disease controls to take full account of the special situation of wild fish."

ANNEX 5

NORTH-EAST ATLANTIC COMMISSION

NEA(96)8

REGULATORY MEASURE FOR FISHING OF SALMON IN THE FAROE ISLANDS FOR THE CALENDAR YEAR 1997

The North-East Atlantic Commission of the North Atlantic Salmon Conservation Organization

Having regard to Article 8, subparagraph (b), recognising the need for regulatory measures in the Faroese fishery for the year 1997 decides that:

The Faroese catch shall be controlled in accordance with an effort limitation programme, set out in Appendix 1, for a period of one year.

The total nominal catch for the duration of the period shall not exceed 425 tonnes.

This quota was agreed as an interim measure leading towards a quota based on a predictive biological model as soon as such scientific advice is available.

The Parties agreed that a thorough examination of the quota level should be carried out in the light of any new scientific evidence which becomes available.

The Parties further agreed that they would undertake to examine measures in their homewaters taking full account of the advice given by ACFM.

Appendix 1

The following regulatory measures for the fishing of salmon in the fisheries zone of the Faroe Islands for the year 1997 shall apply:

(1) Areas with salmon below the length of 60cm will be closed for salmon fishery at short notice, following the general rules for closing areas with undersized fish already in force in the Faroese fisheries zone;
(2) The number of boats licensed for salmon shall not exceed 12;
(3) The salmon fishing season will be limited to 150 days between 1 January and 30 April and 1 November and 31 December;
(4) Subject to the maximum annual catch the total allowable number of fishing days for the salmon fishery in the Faroe Islands zone shall be set at 1200.

ANNEX 6

COUNCIL

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

1. With respect to Atlantic salmon in the North Atlantic area:

   1.1 provide an overview of salmon catches, including unreported catches, and production of farmed and ranched salmon in 1996;
   1.2 report on significant developments which might assist NASCO with the management of salmon stocks;
   1.3 describe the causes of long-term changes in sea-age composition of salmon stocks;
   1.4 describe the causes of changes in abundance of salmon with special reference to changes in natural mortality and ocean climate;
   1.5 review the development of assessments and management advice from the perspective of the precautionary approach;
   1.6 provide a compilation of microtag, finclip and external tag releases by ICES member countries in 1996.

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

   2.1 describe the events of the 1996 fisheries and the status of the stocks;
   2.2 update the evaluation of the effects on stocks and homewater fisheries of the suspension of commercial fishing activity at Faroes since 1991;
   2.3 develop age specific spawning targets;
   2.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   2.5 evaluate the potential by-catch of post-smolts in pelagic fisheries;
   2.6 identify relevant data deficiencies and research requirements.

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

   3.1 describe the events of the 1996 fisheries and the status of the stocks;
   3.2 update the evaluation of the effects on US and Canadian stocks and fisheries of quota management and closures implemented after 1991 in the Canadian commercial salmon fisheries;
   3.3 update age specific spawning targets based on new information as available;
   3.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   3.5 provide multi-year projections of salmon abundance;
   3.6 identify relevant data deficiencies and research requirements.

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

   4.1 describe the events of the 1996 fisheries and the status of the stocks;
   4.2 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   4.3 identify relevant data deficiencies and research requirements.

ANNEX 7

LIST OF NORTH-EAST ATLANTIC COMMISSION PAPERS

Paper No.	Title
NEA(96)1	Provisional Agenda
NEA(96)2	Draft Agenda
NEA(96)3	Election of Officers
NEA(96)4	Draft Report of the Thirteenth Annual Meeting
NEA(96)5	Report of the North-East Atlantic Commission Ad Hoc Working Group on Introductions and Transfers of Salmonids
NEA(96)6	Introductions and Transfers
NEA(96)7	European Union Alternative Wording to Report of NEAC Ad Hoc Working Group on Introductions and Transfers
NEA(96)8	Regulatory Measure for Fishing of Salmon in the Faroe Islands for the Calendar Year 1997
NEA(96)9	Report of the Thirteenth Annual Meeting
NEA(96)10	Introductions and Transfers (consultation document issued after the meeting)
NEA(96)11	Agenda
CNL(96)15	Report of the ICES Advisory Committee on Fishery Management
CNL(96)58	Request for Scientific Advice from ICES

NOTE: This is a listing of all the Commission papers. Some, but not all, of these papers are included in this report as annexes.

REPORT OF THE

THIRTEENTH ANNUAL MEETING

OF THE

WEST GREENLAND COMMISSION

10-14 JUNE 1996
GOTHENBURG, SWEDEN

CHAIRMAN:	MR ERNESTO PENAS (EU)
VICE-CHAIRMAN:	MR ROBERT JONES (USA)
RAPPORTEUR:	MR DAVID DUNKLEY (EU)
SECRETARY:	DR MALCOLM WINDSOR

WGC(96)11

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WGC(96)11

REPORT OF THE THIRTEENTH ANNUAL MEETING OF THE WEST GREENLAND COMMISSION OF THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION 10-14 JUNE 1996, SWEDISH EXHIBITION AND CONFERENCE CENTRE GOTHENBURG, SWEDEN

1. OPENING OF THE MEETING

1.1 The Chairman elected at the Twelfth Annual Meeting of the Commission, Mr Ernesto Penas (EU), was unable to attend, having taken up new duties. Accordingly, the Meeting was opened by the Vice-Chairman Mr Robert Jones (USA) who welcomed the delegates to Gothenburg.

1.2 A list of the participants at the Thirteenth Annual Meeting of the Council and Commissions is included on page 191 of this document.

2. ADOPTION OF THE AGENDA

2.1 The Commission adopted its agenda without amendment, WGC(96)9 (Annex 1).

3. NOMINATION OF A RAPPORTEUR

3.1 Mr David Dunkley (EU) was appointed as Rapporteur for the Meeting.

4. ELECTION OF OFFICERS

4.1 The Commission was advised that Mr Ernesto Penas (EU) was unable to be considered for re-election as Chairman. The representative of Denmark (in respect of the Faroe Islands and Greenland) nominated Mr Robert Jones (USA) as Chairman. The nomination was seconded by the representative of the European Union. There being no other nominations, Mr Jones was elected as Chairman.

4.2 The representative of Canada nominated Mr Andrew Thomson (EU) as Vice-Chairman. The nomination was seconded by the representative of the USA. There being no other nominations, Mr Thomson was elected as Vice-Chairman.

4.3 The representative of the European Union said that for internal logistical reasons, he proposed that Mr Thomson (EU) should be able to take over the chairmanship in two years' time. The representative of the USA agreed that this was an appropriate proposal.

5. REVIEW OF THE 1995 FISHERY AND ACFM REPORT FROM ICES ON SALMON STOCKS IN THE COMMISSION AREA

5.1 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that the fishery at West Greenland in 1995 had been described in the report of the ICES Working Group on North Atlantic Salmon (CNL(96)14). He pointed out,

however, that the correct figure for the total catch taken was 83 tonnes and not 68 tonnes as reported by the Working Group.

5.2 The Chairman of the ICES Advisory Committee on Fishery Management (ACFM), Mr Eskild Kirkegaard, presented the scientific advice relevant to the West Greenland Commission, CNL(96)15. The ACFM report from ICES which contains the scientific advice relevant to all Commissions is included on page 149 of this document.

5.3 Mr Kirkegaard pointed out that the fishery had been suspended during 1993 and 1994 and that the only catch figures available for these years were estimated unreported catches of 12 tonnes in each year. In 1995, examination of salmon scales from samples from the fishery showed that 65% of the catch was of North American origin and 35% was of European origin. There was no real trend in the split between North American and European origin salmon in catches over the available time series of data but there was a hint that there may be a slight increase in the proportion of North American origin salmon in catches in more recent years.

5.4 The effects of the suspension of fishing activity in 1993 and 1994 had been estimated. In doing the calculations, the assumption was made that the entire TAC of 213 tonnes and 157 tonnes in 1993 and 1994 respectively could have been taken if there had been a fishery. The numbers of salmon saved from the fishery were derived from the quotas and the mean weights of fish in the fishery. The numbers were then adjusted to take account of non-catch fishing mortality and then divided into North American and European origin salmon on the basis of the proportions derived from the sampling programme. The estimated additional returns of 2SW salmon to North America represented 30-52% of the total estimated returns in 1994 and 21-38% in 1995. Assuming that all of the saved wild European origin salmon returned to Southern European countries, they would have represented about 5-10% of the returns of MSW salmon in 1994 and 4-9% in 1995.

5.5 The estimated pre-fishery abundance (PFA) of North American non-maturing 1SW salmon calculated for 1995 was the lowest on record. In the years 1993-1995, the PFA had been below the target spawning levels for North American rivers. Thus, even without any fishery, target spawning levels would not have been met.

5.6 Mr Kirkegaard reminded the Commission that serious concern had been expressed at the Twelfth Annual Meeting that the model used to provide catch advice for the West Greenland fishery had shown systematic bias, resulting in consistent over-estimation of PFA. For this reason, ICES recommended that this model should not be used. As a result, the model used by the Working Group in 1996 had been adjusted by including an index of potential smolt production from Canada based on the number of spawners in the years contributing to the smolt run in each region. The adjusted model gave a better fit between the predicted and observed measures of PFA. ACFM felt that, in addition to the better statistical fit, the model benefitted from the inclusion of biological data. This model, named H2-SNLQ by the Working Group, predicted a slight increase in PFA in 1996 compared with 1995. Nevertheless, the recommendation from ACFM was that there should be no landings of salmon from the West Greenland Commission area in 1996 and no landings of salmon from the North American Commission area in 1996 and 1997 except for in-river harvests from stocks in individual rivers which are above biologically-based escapement targets.

5.7 The representative of Denmark (in respect of the Faroe Islands and Greenland) asked the Chairman of the ACFM if the figures he had referred to as "observed" numbers were, in fact, calculated rather than observed. The Chairman of the ACFM agreed that this was the case.

5.8 The representative of Denmark (in respect of the Faroe Islands and Greenland) noted that the new model gave a statistically better fit than the old model but asked if he was correct in his interpretation that the improvement amounted to six percentage points, the r^2 value having risen from 0.61 to 0.67. The Chairman of the ACFM agreed that this was the case but said that the main reason for rejecting the model used last year was the systematic bias in the results it produced. He said that in addition to considering the value of r^2, it was necessary to consider the residual values. The old model had consistently over-estimated PFA in recent years. The addition of a biological parameter was a sensible improvement to the model.

5.9 The representative of the European Union asked whether it was the case that the model introduced in 1993 had been subject to progressive improvement by the Working Group. The Chairman of the ACFM confirmed that this was the case and that the process of improvement would continue.

5.10 The representative of the USA thanked the Chairman of the ACFM and ICES for the report and for the work they had done in recent years to develop catch advice. He asked whether it was standard practice to look at the pattern of residual values as well as the value of r^2 when comparing models. The Chairman of the ACFM said that this was the case. The representative of the USA then asked if the use of spawning levels as a measure of recruitment was a conventional approach and whether this had been discussed in ICES before in relation to any predictive models. The Chairman of the ACFM replied that the use of such information was standard and that this approach had been discussed in ICES. ICES had been concerned that there was too little biology in the original model, it had simply been a good fit between two parameters. The developments leading to the model recommended this year were logical. The representative of the USA asked whether there had been improvements to the model in previous years and whether it was the standard practice of ICES to continue to improve models. The Chairman of the ACFM said that it was standard practice for ICES to improve models and that the model used to provide catch advice for the Greenland fishery had undergone a great deal of development over the last four years. The representative of the USA asked if there had been improvements made to the target spawning levels used in the catch advice model in recent years. The Chairman of the ACFM said that improvements had been made. ICES had been asked to review the target spawning levels set for Canadian rivers and these had been revised, leading to a 3% reduction on previous levels. The target number of 2SW spawners for Canadian rivers for 1996 was 180,000 fish. Last year, there had been a revision of target levels for salmon rivers in the USA.

5.11 The representative of Canada thanked the Chairman of the ACFM for the excellent report and for the progress made in the improvement of models to provide catch advice.

5.12 The representative of Denmark (in respect of the Faroe Islands and Greenland) thanked the Chairman of the ACFM for the work undertaken by the ACFM and also

wished to record his thanks to the Working Group on North Atlantic Salmon. However, he thought that the ACFM had done only half its job.

5.13 The representative of the European Union expressed his thanks to the Chairman of the ACFM.

5.14 The representative of the USA said that the results produced by the model showed that the PFA in 1995 was the lowest on record. The number of fish calculated was less than the target spawning level, even though the target had been revised downwards. He said that compared with last year, there had been some improvement in the PFA for 1996 but that it was important to look at the advice provided by the ACFM over the whole time series of data. He said that an important element in the exercise was the assessment of risk. As a result of the over-estimates of PFA produced in recent years, it was clear that risks had been taken. It was necessary now to adopt a very cautious stand because it is clear that for several years there had been no surplus stock available for exploitation. The Chairman of the ACFM agreed with these conclusions.

5.15 The representative of the European Union asked if the Chairman of the ACFM would give more details of the interpretation of Figures 5.2.1 and 5.2.2 in the ACFM report which, he believed, indicated declines in the Southern European stocks. The Chairman of the ACFM said that he felt that this was the correct interpretation and drew the Commission's attention to Figure 5.2.5 which compared estimates of the PFA of non-maturing Southern European stocks with estimates of the area of thermal habitat. He said that the trends were similar and that the picture here was the same as for North American stocks.

6. REGULATORY MEASURES

6.1 The representative of Denmark (in respect of the Faroe Islands and Greenland) tabled two documents, WGC(96)6 (Annex 2) and WGC(96)7 (Annex 3). He said that with respect to the regulation of salmon fisheries in the North Atlantic, there had been heated discussions for many years. These had started in the late 1960s, before NASCO had been established. At that time, the fishery at West Greenland had been conducted by a number of different countries. Attempts at regulation had been made using diplomatic approaches. Greenland had always argued for high quotas, while all the other countries wanted a reduction in the fishery. NASCO had been established not to fulfill the wishes of some people in the UK, Canada or the USA who wished to see the fishery eliminated, but primarily to establish a forum for discussing and agreeing balanced solutions to the problems associated with salmon fisheries. He said that smolts from rivers in Europe and North America migrate to the waters around Greenland and the Faroe Islands to feed and grow. He wished to point out that Greenland and the Faroe Islands were the salmon-producing nations, homewater countries were smolt-producing nations.

6.2 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that Denmark (in respect of the Faroe Islands and Greenland) had worked loyally within NASCO even though it viewed the Convention as somewhat biased in that there were mechanisms for regulation of the fisheries at Greenland and the Faroe Islands but not for regulation of homewater fisheries. However, for many years there had been no scientific basis for the regulatory measures adopted. Denmark (in respect

of the Faroe Islands and Greenland) had agreed to a reduction in quota if a method based on science was found and if it was agreed that the quota could go up as well as down depending upon the status of stocks. In 1993, the model named H123 had been developed by ICES. All Parties agreed to fix quotas for a period of five years and the use of this model was fundamental to the agreement reached by the Commission in 1993. Since then, Denmark (in respect of the Faroe Islands and Greenland) had adhered to the agreement and had accepted the model as a basis for setting quotas.

6.3 The representative of Denmark (in respect of the Faroe Islands and Greenland) referred to the figure presented in document WGC(96)6. There had been no agreement on a quota in 1992 but that agreed in 1993 was much lower than previous quota levels. Denmark (in respect of the Faroe Islands and Greenland) accepted the quota because it was in accord with the agreement which had been reached and with the model which had been developed in 1993.

6.4 The representative of Denmark (in respect of the Faroe Islands and Greenland) referred to document WGC(96)7 which called for application of the agreement made in 1993, in particular to the undertaking that a quota agreement should commit the Parties for a significant period and not be subject to change in its fundamental parameters unless agreed by the Parties. This year the PFA had increased and he felt that now was the time for the other members of the West Greenland Commission to keep to the agreement that quotas could go up as well as down. Denmark (in respect of the Faroe Islands and Greenland) proposed that a quota of 271 tonnes should be set for 1996, this figure having been calculated by the ICES Working Group on North Atlantic Salmon. The Working Group had presented two models in its report but the ACFM had presented only one. The representative of Denmark (in respect of the Faroe Islands and Greenland) felt that the adoption of the H2-SNLQ model represented a change in the fundamental parameters and that this was contrary to the agreement reached in 1993. He said that just as the quota of 77 tonnes set in 1995 had been the result of a mathematical exercise, the quota of 271 tonnes proposed for 1996 was the result of the same exercise.

6.5 The representative of the USA thanked the representative of Denmark (in respect of the Faroe Islands and Greenland) for the background information he had provided. He said that the USA strongly supported the agreement reached in 1993 and agreed that quotas should be able to go up as well as down. However, it was important to note that the agreement in 1993 stated that quotas should be based on the best available scientific advice from ICES, not advice from the Working Group on North Atlantic Salmon. The advice from ICES was that presented by the ACFM, which had been peer-reviewed. He said that the figure of 271 tonnes did not appear in the advice from ICES. He felt that the proposal put forward by Denmark (in respect of the Faroe Islands and Greenland) in document WGC(96)7 did not accord with the 1993 agreement.

6.6 The representative of the European Union said that he agreed with the views expressed by the representative of the USA. He said that the agreement reached in 1993 stated that quotas should be determined annually based on the best available scientific advice from ICES. Advice would necessarily change from year to year and the model used would be adjusted annually in order to improve it. He said that there were clear

indications in the advice from ICES that there is a problem. While he respected the stand taken by Denmark (in respect of the Faroe Islands and Greenland), the advice given by ICES must be acknowledged.

6.7 The representative of Canada said that the best available advice from ICES was that there should be no fishery at West Greenland. Therefore, he could not agree with the proposal put forward by Denmark (in respect of the Faroe Islands and Greenland).

6.8 The Chairman of the ACFM said that a number of Working Groups report to the ACFM. The reports they produce are regarded by ICES as internal documents which provide background information to allow ACFM to develop its advice. The report of the Working Group on North Atlantic Salmon was made available to NASCO for the sake of openness, but it was primarily a document produced to assist the ACFM.

6.9 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that ICES should provide advice on the basis of the agreements reached. The H123 model was the agreed model but had not been used by the ACFM. He said that the model used to predict the PFA was a fundamental parameter in the 1993 agreement and that this had been changed. He said that there were important implications for the West Greenland Commission if agreements were not implemented. Difficulties could arise when agreements expired. It could also make things difficult in other fora. For example, with regard to the UN Resolution on Straddling Fish Stocks and Highly Migratory Fish Stocks, there is a mechanism for pre-setting reference points when quota agreements are being made. If all NAFO members were to subscribe to this approach and if they agreed on a reference point, for example for Greenland halibut, only to be told after two years that a new method had been developed to calculate the reference point with the result that all fishing should stop immediately, this would be the end of the mechanism for pre-setting reference points.

6.10 The representative of the USA said that each Party had indicated its support for the 1993 agreement. He pointed out that it was not for NASCO or the West Greenland Commission to develop scientific advice or to dictate how such advice should be obtained. ICES had been asked for advice and had answered carefully. The focal point of the advice was in Table 4.2.3 in the ACFM report. This table included the fundamental parameters and catch options. ICES had developed estimates of PFA under terms approved by NASCO. The estimates calculated annually had changed over time and target spawning levels had also changed over time. The model H123 was not the model used in 1993. He said that the ACFM was the final arbiter of scientific advice. With regard to the reference to the UN Resolution on Straddling Fish Stocks and Highly Migratory Fish Stocks, the representative of the USA said that the pre-set reference points developed are for use by managers and are designed to set limits to reduce risk. Methods change as data improve and whereas the names of the reference points may stay the same, the values may change. He said that as managers decide policy and not science, it was necessary to have reference points agreed in advance. He said that given the advice provided by ICES, the only reasonable option was that there should be no fishing at Greenland in 1996.

6.11 The representative of the European Union agreed with the remarks made by the representative of the USA. He asked the Chairman of the ACFM if he could confirm that whereas the H123 model had been used to provide advice in 1995, the advice

given in 1993 and 1994 had been developed using the H3 model. The Chairman of the ACFM confirmed that this was the case. He said that ICES had never been told which model to use but had assumed that as the best available scientific advice was required, it should use the most appropriate model. He said that ICES would always take this line.

6.12 The representative of Denmark (in respect of the Faroe Islands and Greenland) asked the representative of Canada what measures would be taken in that country to conform with the advice given by the ACFM. The representative of Canada said that an announcement would be made by the Fisheries Minister shortly.

6.13 The representative of Denmark (in respect of the Faroe Islands and Greenland) drew attention to the final paragraph of the summary in document CNL(96)34 where reference is made to the effects on juvenile salmon stocks of predation by mergansers. He asked what measures would be taken by other Parties to control such losses. The Chairman said that he considered the remarks in the document to be the thoughts of a single author and it may be more appropriate for this document to be discussed in the Special Session of the Council on "Atlantic Salmon as Predator and Prey".

6.14 Following consultations between the Heads of Delegations, the representative of Denmark (in respect of the Faroe Islands and Greenland) referred to the proposal contained in WGC(96)7, that the quota for Greenland for 1996 should be 271 tonnes. The representative of the USA said that this proposal did not take account of the advice from ICES and was not in accordance with the agreement reached in 1993. He could not, therefore, accept it.

6.15 The Chairman then put the proposal to the vote. Denmark (in respect of the Faroe Islands and Greenland) voted in favour of the proposal. Canada, the European Union and the USA all voted against the proposal. The proposal was, therefore, rejected.

6.16 The representative of the USA tabled document WGC(96)10 (Annex 4) setting out a proposal from the USA for a catch quota for the 1996 fishery. He said that the catch quota should be set in accordance with the agreement reached in 1993. The proposal was that the quota should be based on the information provided in Table 4.2.3 of the ACFM report using the 50% probability level and the proportion at West Greenland of 0.4.

6.17 The representative of the European Union asked if the representative of the USA would confirm that if adopted, this would result in a quota of zero. The representative of the USA agreed that this was the case. He said that acceptance of the advice from ICES was the important thing, not the number generated by the advice.

6.18 The representative of Canada said that he deeply regretted that an agreement on this issue had not been possible and that a year of the agreement cycle begun in 1993 had now been lost. He agreed that in such negotiations many factors were involved but that the fundamental issue was that the advice sought from ICES should be adopted. He therefore supported the proposal from the USA.

6.19 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that he could not accept the proposal. He felt that it was out of line with the

fundamental parameters of the mechanism agreed in 1993. He wanted to make it clear that Denmark (in respect of the Faroe Islands and Greenland) would not be voting against the ACFM giving what they thought was the best advice but against a proposal which it regarded as a breach of the 1993 agreement.

6.20 The representative of the European Union said that he supported the proposal from the USA.

6.21 The representative of the USA said that he appreciated the efforts that had gone into the negotiations. The USA had offered this proposal because no agreement had been reached. He felt that there had been room for compromise by accepting changes in factors such as risk levels but regretted that no such compromise agreement had been reached. He noted that the representative of Denmark (in respect of the Faroe Islands and Greenland) had accepted the need to accept the advice from ICES. He said that an agreement on catch levels was important for the management and conservation of Atlantic salmon and hoped that a quota in accordance with the ICES advice could be agreed. He said that it would be detrimental to the work of NASCO if the impasse remained. He said that if no agreement was reached, the Parties must immediately begin to examine anew how to deal with regulatory measures for the fishery.

6.22 The Chairman then put the proposal to the vote. Canada, the European Union and the USA all voted for the proposal. Denmark (in respect of the Faroe Islands and Greenland) voted against the proposal. The proposal was, therefore, rejected.

6.23 The representative of the European Union said that it was with deep regret that the European Union took note of the situation that the West Greenland Commission had not been able to reach an agreement for regulatory measures for 1996. He said that the European Union encouraged and urged all contracting Parties to continue the work with a view to reaching an agreement for 1996. He said that the European Union will continue to contribute to this procedure in a spirit of constructive compromise.

6.24 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that he regretted that the progress made over the last few years seemed to be best described as "two steps forward and one step back". He said that two steps forward had been made in 1993 but what had happened at this meeting of the Commission amounted to a step backwards. He said that there was clearly some disagreement over the role of ICES and over the role of the West Greenland Commission. He said that everyone was in favour of complete freedom for ACFM to say what it wants, not least his delegation, having experienced "creeping politicisation" in the scientific body of another organization. He strongly favoured that scientific advice should be independent. The problem was not whether the Commission should take into account the ACFM advice but to what extent - in a long-term agreement - should totally unexpected advice automatically set the outer limits for regulatory measures.

6.25 The representative of the European Union said that he disagreed with the reference to "creeping politicisation" made by the representative of Denmark (in respect of the Faroe Islands and Greenland).

6.26 The representative of Denmark (in respect of the Faroe Islands and Greenland) said that this remark did not refer to ICES. The influence of politics had, however, become apparent in negotiations about other, larger animals.

6.27 The representative of the USA agreed with the representative of the European Union that the Commission should be careful to heed the advice presented by ICES and to ensure that the independence of ICES was maintained. He did not believe that the independence of ICES had been compromised or that ICES had done anything other than what had been asked of them. He said that it would be a grave error to instruct ICES on what science to do or that ICES may only provide advice as long as it conforms to what is expected. He said that ICES scientists were asked to apply their skills and the report they produced was then discussed by a recognised body so that the appropriate advice could be provided.

6.28 The representative of the USA noted the reference by the representative of Denmark (in respect of the Faroe Islands and Greenland) to the Commission having an automatic procedure to set regulatory measures. He said that it was regrettable that no agreement had been reached. A large number of options had been asked of ICES and he felt that some should be regarded as matters for negotiation. He regretted that instead of arguing over these matters, arguments had arisen over the role of ACFM. He said that the Parties should work for a new agreement to clarify what is a matter of policy and what is a matter of advice for the management and conservation of salmon.

6.29 The representative of Canada said that the scientific advice received from ICES was not only the best but the only advice available to the Commission. He felt that the Commission had a duty to heed that advice. The Commission should not distinguish between advice it likes and does not like then pick and choose. He said that such an approach would put the resource in an untenable position.

6.30 With regard to the reference made by the representative of Denmark (in respect of the Faroe Islands and Greenland) to other, larger animals, the representative of Canada said that the advice provided had not always been heeded and the penalty was now being paid. He said that it is much more difficult and costly to try to restore stocks that have been decimated than it is to try to maintain stocks with some degree of health still in them. He said that it was important that conservation was given top priority.

6.31 The Chairman said that he was disappointed in the outcome of the negotiations. He hoped that Parties would begin immediately to develop a new agreement. He said that all Parties should note that he would be available to facilitate the process in any way he could.

7. RECOMMENDATIONS TO THE COUNCIL ON THE REQUEST TO ICES FOR SCIENTIFIC ADVICE

7.1 The Secretary reported that Mr Michael Andersen (Denmark (in respect of the Faroe Islands and Greenland)) was no longer able to serve on the Standing Scientific Committee having moved to a new position. The representative of Denmark (in respect of the Faroe Islands and Greenland) nominated Mr Per Kanneworff for the

vacant position on the Standing Scientific Committee. The Secretary reminded the Commission that members of the Standing Scientific Committee did not represent any particular delegation.

7.2 The Chairman of the Standing Scientific Committee presented document SSC(96)6 which contained the draft recommendations to the Council on the request to ICES for scientific advice. He drew attention to the revised format of the questions.

7.3 The representative of Denmark (in respect of the Faroe Islands and Greenland) drew attention to question 4.2 and said that the same problems as encountered this year might be experienced again. The representative of the USA said that he thought the revised format of the questions was helpful.

7.4 The document was adopted by the Commission. The request to ICES agreed by the Council, CNL(96)58, is contained in Annex 5.

8. ANNOUNCEMENT OF THE TAG RETURN INCENTIVE SCHEME PRIZE

8.1 The Chairman announced that the winner of the 1996 NASCO Tag Return Incentive Scheme Prize for the West Greenland Commission area was Mr Vittus Poulsen of Atangmik, Greenland. The fish had been tagged as a smolt in the Penobscot River, USA and recaptured at Ammasivik Fjord in Greenland. The winner will receive a prize of $1500. The Commission offered its congratulations to the winner.

9. OTHER BUSINESS

9.1 There was no other business.

10. DATE AND PLACE OF NEXT MEETING

10.1 The Commission agreed to hold its next annual meeting during the Fourteenth Annual Meeting of the Council which will be held during 9-13 June 1997 in Ilulissat, Greenland.

11. CONSIDERATION OF THE DRAFT REPORT OF THE MEETING

11.1 The Commission agreed a draft report of the meeting, WGC(96)4.

ANNEX 1

WGC(96)9
THIRTEENTH ANNUAL MEETING OF THE
WEST GREENLAND COMMISSION
10-14 JUNE 1996
SWEDISH EXHIBITION & CONGRESS CENTRE, GOTHENBURG, SWEDEN

AGENDA

1. Opening of the Meeting
2. Adoption of the Agenda
3. Nomination of a Rapporteur
4. Election of Officers
5. Review of the 1995 Fishery and ACFM Report from ICES on Salmon Stocks in the Commission Area
6. Regulatory Measures
7. Recommendations to the Council on the Request to ICES for Scientific Advice
8. Announcement of the Tag Return Incentive Scheme Prize
9. Other Business
10. Date and Place of Next Meeting
11. Consideration of the Draft Report of the Meeting

ANNEX 2

WEST GREENLAND COMMISSION

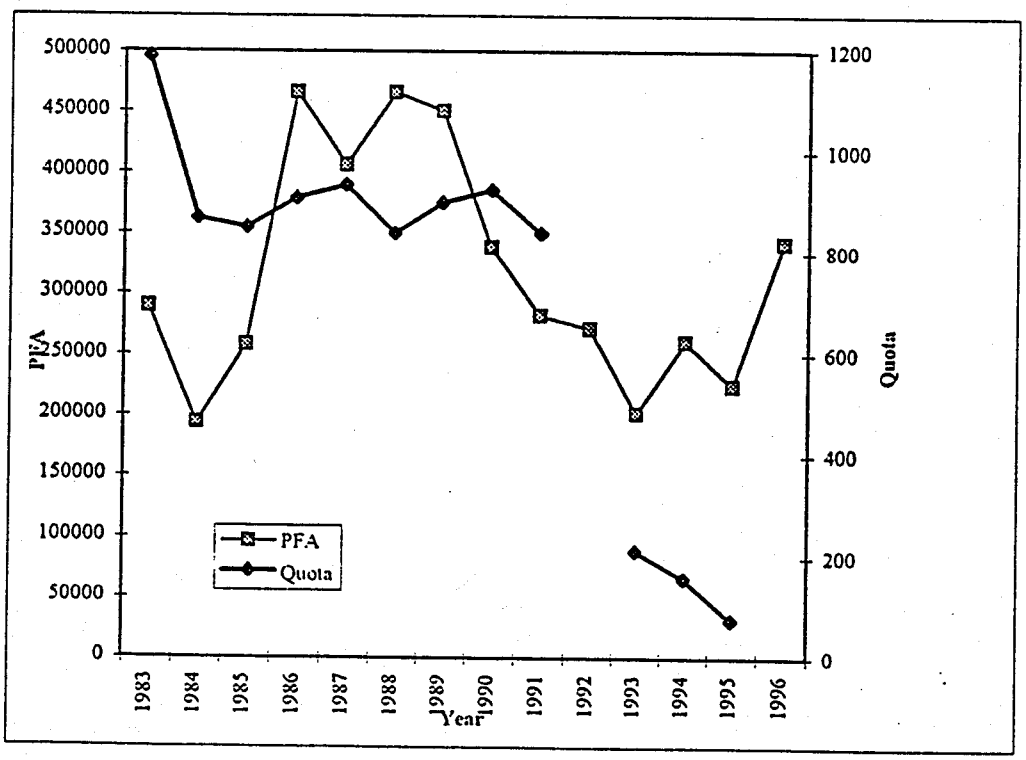
WGC(96)6

PRE-FISHERY ABUNDANCE VS. GREENLAND QUOTA (TABLED BY GREENLAND)

Pre-fishery abundance vs. Greenland quota
Model H123

Year	Pre-fishery abundance	Greenland quota
1983	289277	1190
1984	193668	870
1985	258187	852
1986	466002	909
1987	405691	935
1988	466002	840
1989	450574	900
1990	338134	924
1991	281797	840
1992	271044	
1993	201382	213
1994	260758	159
1995	224291	77
1996	341874	

PFA values from Working Group report Table 9.2.2.1.
Quota for 1988-1990 was 2.520 t with an opening date of 1 August and annual catches not to exceed the annual average (840 t) by more than 10%. Quota adjusted to 900 t in 1989 and 924 t in 1990 for later opening dates.



ANNEX 3

WEST GREENLAND COMMISSION

WGC(96)7

PROPOSAL BY GREENLAND FOR A CATCH QUOTA FOR THE WEST GREENLAND FISHERY IN 1996

The West Greenland Commission

- having regard to the Quota Agreement adopted by the Parties at its Tenth Annual Meeting, WGC(93)9, (attached),

- applying without change the fundamental parameters of the said agreement,

- recognizing that the stock is in better condition in 1996 than in 1995, and that the West Greenland quota therefore should be adjusted upwards according to the said Agreement,

agrees to establish a catch quota for the West Greenland salmon fishery in 1996 of 271 tonnes.

WGC(93)9

PROPOSAL FROM THE CHAIR FOR EMERGENCY REGULATORY MEASURES IN THE WEST GREENLAND COMMISSION AREA

The Parties sought an agreement on the West Greenland quota which reconciled the following principal considerations:

- An agreement should take effect in 1993;
- Quotas should be determined annually based on the best available scientific advice from ICES;
- A quota would adjust up or down relative to the best available scientific advice;
- A quota agreement should recognize a transition period to implement the significant adjustment required to accommodate new ICES advice given in 1993;
- A quota agreement should commit the Parties for a significant period and not be subject to change in its fundamental parameters unless agreed by the Parties.

The Parties recalled:

- Article 3.2 of the Convention that "the objective of the Organization shall be to contribute through consultation and cooperation to the conservation, restoration, enhancement and rational management of salmon stocks subject to this Convention, taking into account the best scientific evidence available to it."
- Article 9(g) to take into account "the interest of communities which are particularly dependent on salmon fisheries."

Accordingly, the Parties, in order to address the decline in abundance of wild stocks of Atlantic salmon and to provide adequate spawning stocks of 2SW fish to support sustainable populations, agree to establish an annual quota for each of the years 1993 to 1997 by application of the following mechanism:

The quota shall be based on scientific advice from the following sources, and applied in the following manner without prejudice to new advice from ICES:

- The ICES advice on the pre-fishery abundance of potential 2SW salmon of North American origin (and European origin if available).
- The ICES advice on the target spawning escapement reserve of potential 2SW salmon necessary to achieve target spawning escapement, or a different proportion of this reserve as agreed to by the Parties.

- Any surplus above the target spawning escapement reserve, or the proportion agreed to, may be available for harvest by the Parties.

- Allocation of the surplus shall be based on the average for the period 1986-1990 of the harvest share of potential 2SW salmon of North American origin caught at West Greenland (40%), or a different share if agreed upon by the Parties.

- Any other parameters used by the Parties shall be as advised by ICES.

The Parties, recognizing the difficulty of establishing a new catch quota for the 1993 West Greenland fishery at the levels recommended by ICES, hereby agree to a 1993 catch quota of 213 tonnes which is expected to achieve 72% of the ICES target spawning escapement reserve. This quota is expected to provide for an increase in the spawning escapement of approximately 50 percent over the average of the past 10 years.

For 1994 the Parties seek to achieve a minimum of 85% of the ICES target spawning escapement reserve level as advised by ICES at that time, and thereafter, the Parties will seek to achieve 100% of the ICES target spawning escapement reserve level. Any increase in the pre-fishery abundance advised by ICES for 1994 above that advised in 1993 will be applied first to increasing the percentage of the target spawning escapement reserve to be achieved in 1994.

ANNEX 4

WEST GREENLAND COMMISSION

WGC(96)10

PROPOSAL BY THE UNITED STATES FOR A CATCH QUOTA FOR THE WEST GREENLAND FISHERY IN 1996

In accordance with the WGC agreement of 1993, WGC(93)9, on the setting of a quota for the fishery at West Greenland and consistent with the scientific advice provided to the WGC in the report of the ICES Advisory Committee on Fishery Management, CNL(96)15, Section 4.2, the West Greenland Commission hereby sets a quota for the 1996 fishery for salmon at West Greenland. The quota shall be based on the information provided in Table 4.2.3 of the ICES Advisory Committee Report using the 50% probability level and the proportion at West Greenland of 0.4.

ANNEX 5

COUNCIL

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

CNL(96)58

REQUEST FOR SCIENTIFIC ADVICE FROM ICES

1. With respect to Atlantic salmon in the North Atlantic area:

   1.1 provide an overview of salmon catches, including unreported catches, and production of farmed and ranched salmon in 1996;
   1.2 report on significant developments which might assist NASCO with the management of salmon stocks;
   1.3 describe the causes of long-term changes in sea-age composition of salmon stocks;
   1.4 describe the causes of changes in abundance of salmon with special reference to changes in natural mortality and ocean climate;
   1.5 review the development of assessments and management advice from the perspective of the precautionary approach;
   1.6 provide a compilation of microtag, finclip and external tag releases by ICES member countries in 1996.

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

   2.1 describe the events of the 1996 fisheries and the status of the stocks;
   2.2 update the evaluation of the effects on stocks and homewater fisheries of the suspension of commercial fishing activity at Faroes since 1991;
   2.3 develop age specific spawning targets;
   2.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   2.5 evaluate the potential by-catch of post-smolts in pelagic fisheries;
   2.6 identify relevant data deficiencies and research requirements.

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

   3.1 describe the events of the 1996 fisheries and the status of the stocks;
   3.2 update the evaluation of the effects on US and Canadian stocks and fisheries of quota management and closures implemented after 1991 in the Canadian commercial salmon fisheries;
   3.3 update age specific spawning targets based on new information as available;
   3.4 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   3.5 provide multi-year projections of salmon abundance;
   3.6 identify relevant data deficiencies and research requirements.

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

   4.1 describe the events of the 1996 fisheries and the status of the stocks;
   4.2 provide catch options with an assessment of risks relative to the objective of achieving spawning targets;
   4.3 identify relevant data deficiencies and research requirements.

ANNEX 6

LIST OF WEST GREENLAND COMMISSION PAPERS

Paper No.	Title
WGC(96)1	Provisional Agenda
WGC(96)2	Draft Agenda
WGC(96)3	Election of Officers
WGC(96)4	Draft Report of the Thirteenth Annual Meeting
WGC(96)5	Not issued
WGC(96)6	Pre-fishery Abundance vs. Greenland Quota (tabled by Greenland)
WGC(96)7	Proposal by Greenland for a Catch Quota for the West Greenland Fishery in 1996
WGC(96)8	Summary of the Greenlandic Fishery for Salmon, 1995
WGC(96)9	Agenda
WGC(96)10	Proposal by the United States for a Catch Quota for the West Greenland Fishery in 1996
WGC(96)11	Report of the Thirteenth Annual Meeting
CNL(96)15	Report of the ICES Advisory Committee on Fishery Management
CNL(96)58	Request for Scientific Advice from ICES

NOTE: This is a listing of all the Commission papers. Some, but not all, of these papers are included in this report as annexes.

REPORT OF THE ICES ADVISORY COMMITTEE ON FISHERY MANAGEMENT

CNL(96)15

REPORT TO THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

Source of information: Report of the Working Group on North Atlantic Salmon, April 1996 (ICES Doc. CM 1996/Assess:11).

Sections 1–6 of this report are set out in the order of the questions from NASCO to ICES (Appendix 1).

1. EVENTS OF THE 1995 FISHERIES AND THE STATUS OF STOCKS BY COMMISSION AREAS

1.1 Overview of Catches in the North Atlantic

1.1.1 Nominal catches of salmon in the North Atlantic

Nominal catches of salmon by country in the North Atlantic for 1960-1995 are given in Table 1.1.1 and reported catches by NASCO Commission Areas for 1990–1995 are shown below (in tonnes):

Area	1990	1991	1992	1993	1994	1995
NEAC	3758	2951	3379	3348	3596	3078
NAC	915	713	524	375	358	270
WGC	275	476	242	0	0	68
Total	4948	4140	4136	3723	3954	3416

The catch data for 1995 are provisional and incomplete, but the final figure is unlikely to exceed the 1994 total (Figure 1.1.1). Catches in most countries remain below the averages of the previous 5 and 10 years. Some of the decline in catches in recent years may be accounted for by management plans which have reduced fishing effort in several countries.

1.1.2 Unreported catches of salmon in the North Atlantic

The total unreported catch within the NASCO Commission areas in 1995 was estimated to be 1,050 t, a decrease of 18% compared with 1994 and 38% below the 1990–1994 five-year mean of 1,691 t (Table 1.1.1). No estimate could be made of the unreported catch in international waters in 1995. Estimates for the Commission Areas are given below (in tonnes):

Area	1990	1991	1992	1993	1994	1995
NEAC	1779	1555	1825	1471	1157	942
NAC	111	127	137	161	107	98
WGC	n/a	n/a	n/a	12	12	< 10
International waters	180-350	25-100	25-100	25-100	25-100	n/a

For most countries, information on unreported salmon catches is based upon the local knowledge of fishery managers or bailiffs who are familiar with the fisheries. The values are generally termed 'guess-estimates', indicating that they are not derived from annual surveys of fisheries or analyses of catch data. However, these values are usually supported, in part at least, by observations and survey results. Estimation of the level of landings for local consumption at West Greenland is discussed in Section 1.4.1. Although ICES was unable to evaluate the accuracy of the processes used for developing the estimates of unreported catches, it considered that the data provided represented the best available information. It is important that assessments are based upon estimates of the total fishing mortality and these should therefore be supported by better documentation of unreported catches and continued efforts to achieve full reporting wherever possible.

1.1.3 Production of farmed and ranched salmon in the North Atlantic

The production of farmed salmon in the North Atlantic area in 1995 was 413,200 t. This is the largest production in the history of the farming industry (Figure 1.1.2) and represented a further 26% increase compared to 1994 (326,630 t) and a 61% increase on the 1990–1994 average (256,123 t).

The total production of ranched salmon in countries bordering the North Atlantic in 1995 was 309 t which is the lowest value since 1990. The majority (94%) of the ranching is conducted in Iceland, where it represents about two thirds of the nominal catch.

1.2 Fisheries and Stocks in the North-East Atlantic Commission (NEAC) Area

1.2.1 Fishing in the Faroese area

Gear and effort: In accordance with the agreement between the Faroese Salmon Fishermen's Association and the North Atlantic Salmon Fund, commercial fishing for salmon in Faroese territorial waters was suspended for the years 1991 to 1996. A research fishery for salmon continued to operate in the Faroes area in the 1994/1995 season, and one research vessel fished a total of 49 long-line sets during 5 trips. The gear used was the same as in previous seasons.

Catch: The total catch in the research fishery in the 1994/1995 season was 7 t and the preliminary catch for the calendar year 1995 was 5 t, excluding fish that were tagged and released. The proportion of fish less than 60 cm (which should be discarded in the

commercial fishery) was 15.1%, which is at the upper end of the range observed since the 1982/1983 season.

Catch per unit of effort: The mean CPUE for the 1994/1995 season was 36 salmon per 1,000 hooks (Figure 1.2.1). This is the lowest value (equal with 1984/1985) since the 1981/1982 season. However, the CPUE data for the research fishery (since 1991/1992) may not be directly comparable with those for the commercial fishery (prior to 1991/1992).

Origin of the catch: In the 1994/1995 season 20% of the fish were estimated to be of farm origin. This is similar to 1993/1994 (19%) but is much lower than in the 1989/1990 to 1992/1993 seasons (31–46%). Figure 1.2.1 shows the CPUE for past seasons divided into wild fish and farm escapees. This suggests that the high CPUE values in the 1988/1989 to 1992/1993 seasons were due in part to the large numbers of farmed fish in the catch.

External tags and coded wire tags were recovered from countries regularly represented in the tag recovery programmes. As in the past, the highest recapture rates were from releases in Norway and Sweden; recapture rates from other areas were low.

In the 1992/1993 to 1994/1995 fishing seasons, a total of about 5,300 salmon caught on long-line were tagged and released in the open sea north of the Faroes. After three fishing seasons (i.e. 1993–1995) 98 tagged fish have been reported recaptured in 10 countries as shown below:

Country	Recaptures	
	Total to date	%
Norway	58	59
Scotland	12	12
Ireland	9	9
Russia	5	5
Sweden	5	5
Canada	4	4
Denmark	2	2
England	1	1
Iceland	1	1
Spain	1	1
Total	**98**	**99**

Further tag recoveries are expected, and the recovery data have not been analysed to take account of the age composition or proportion of farmed/reared fish in the tagged groups or weighted for different exploitation rates in homewater fisheries. The results do not therefore quantitatively indicate the origin of the salmon in Faroese waters, although they support earlier information that the majority of salmon in the Faroese area originate from Norway. Between 17% and 33% of the tagged fish were assumed to be of farm origin, and the recapture rate for these fish has been lower than for wild fish.

Exploitation Rates at Faroes: As there has been no commercial fishery, the exploitation rate on all monitored stocks in Faroese waters in 1994/1995 was very low.

1.2.2 Homewater fisheries in the NEAC area

Gear and effort: Minor changes in commercial and recreational salmon fishing effort were reported in 1995, continuing the reduction in commercial fishing effort in the North-East Atlantic area in recent years. These reductions mainly arise from conservation measures in the respective countries and the reduced value of commercially caught salmon.

Catch: Provisional figures suggest that nominal catches of salmon in North-East Atlantic countries in 1995 were at a similar level to, or below, those in 1994. The final figures for 1994 were slightly higher than in the previous year but still below the previous 5 and 10 year averages.

CPUE: CPUE varies considerably among fisheries. In UK (Northern Ireland) and UK (England & Wales) levels in 1995 were similar to 1994.

Composition of catch: The proportion of 1SW fish in national catches varied from 58% to over 90%. The lowest proportions of 1SW fish in catches were reported in Norway, Finland and France (rod fishery) and the highest in Ireland, France (net fishery), Iceland and Russia. No significant changes in the 1SW/MSW salmon ratio were reported compared to the previous year. In Norway, the number of 2SW salmon was high following the high proportion of 1SW fish in 1994.

Origin of catch: Ranched fish continue to comprise the majority of the Icelandic catch and some straying is observed into rivers. In Norway, the proportion of farm origin fish in samples from coastal fisheries has increased slightly compared to 1994. Fish farm escapees are also observed at variable levels in coastal and in-river fisheries in UK (Scotland) and in small numbers in catches in Ireland and UK (Northern Ireland).

Exploitation rates: Exploitation rates in homewater fisheries vary considerably among different river stocks. Mean rates (1990-1994) for a small number of monitored stocks range from less than 20% to over 80%. In recent years, exploitation rates on some stocks have declined as a result of reduced fishing effort; however, in some other cases levels of exploitation have been maintained at a high level. Levels of exploitation in 1995 were similar to previous years in most fisheries although in-river exploitation rates were reduced in several rivers in UK, probably due to low river flow conditions.

1.2.3 Status of stocks in the NEAC area

There are well over 1,000 rivers supporting salmon in the NEAC area, but for most of these there is no information on the status of the stocks.

Minimum biologically acceptable levels (MBAL) have been established for 7 river stocks in the NEAC area. As yet, spawning targets have not been established for these stocks.

In three of the stocks, egg deposition exceeded MBAL in 1995 and in a fourth it was within 10% of MBAL. In the remaining three rivers egg deposition was less than 70% of MBAL. Of the five rivers for which data are available for at least 10 years, three exceeded the reference egg deposition level in at least 72% of years while the other two failed to meet their reference levels in at least 77% of the years.

Examination of the general trends suggests that there has been no significant change in smolt production in the North-East Atlantic as a whole. Adult runs in western European rivers appear to be increasing or at least remaining stable, probably due to lower exploitation in recent years.

Survival indices to homewaters for both wild and hatchery-reared 1SW and 2SW stocks showed a downward trend over the past decade. The wild and hatchery-reared 2SW stocks also showed a decrease over the last 5 years.

The implications of these observations for the management of salmon stocks in the NEAC area are discussed in Section 5.

1.2.4 Changes in natural mortality

Natural mortality may be affected by a wide range of factors. Changes in environmental factors and freshwater habitat may cause both short and long-term changes in mortality which may affect stock abundance. Some diseases (e.g. UDN) and parasites (e.g. *Gyrodactylus salaris*) have had significant impacts on some stocks, but they do not generally cause obvious problems. The effects of predators are often difficult to determine. Populations of a number of predators, including seal species and cormorants, are known to have been increasing in recent years, but their effects on salmon populations are not generally known.

Available estimates of the natural mortality throughout the marine phase of the life cycle for European stocks vary from about 70% (River Bush wild salmon) to over 97% (Drammen River hatchery-reared salmon). Levels have been variable and have generally been increasing over the last 5–10 years. Mortality is generally higher on hatchery-reared salmon than wild fish.

1.2.5 Surface trawl surveys in the NEAC area

Scientific surveys using surface trawls in the North-East Atlantic caught significant numbers of post-smolts off north-west Scotland in June 1995 and in the Norwegian Sea in July and August (Figure 1.2.2).

1.2.6 Data deficiencies and research needs for the NEAC area

ICES supports the continuation of the research fishing programme in the Faroes area and recognises that the results from the project will improve the possibility of assessing the stocks in the North-East Atlantic.

Norwegian scientists have obtained important preliminary information on the distribution of post-smolts in the North-East Atlantic area. Continued and enhanced

efforts should be made by all parties to provide more information on post-smolt biology.

Methods are required for establishing the appropriate level of spawning escapement targets related to management objectives.

Spawning reference levels and escapement targets have to be developed for the majority of salmon rivers in the NEAC area as soon as possible in order to advance the development of catch advice. To facilitate this, more information is required on juvenile production in rivers based on fry/parr surveys and smolt counting. More effort is also needed in quantifying habitat types in order to extrapolate spawning targets derived from rivers which have established stock and recruitment relationships to rivers where this information is not available.

Further work should be conducted on methods to discriminate farm origin and reared salmon in catches, with particular reference to the use of intra-abdominal lesions.

Information on fishing effort should be collected in more fisheries in order to develop time series of CPUE data for use in assessing stock status.

Reporting systems should be improved to cover all catches and estimates of presently unreported catches should be improved for all fisheries, particularly those in home waters. Every effort should also be made to instigate a surveillance programme to provide reliable estimates of the fishing effort for salmon in international waters and information should be obtained on by-catches of post-smolts in the surface trawl fisheries in the Norwegian Sea.

The estimates of pre-fishery abundance of maturing and non-maturing 1SW salmon in the NEAC area should be improved and possible relationships with environmental and biological (e.g. predation) variables should be investigated.

1.3 Fisheries and Stocks in the North American Commission (NAC) Area

1.3.1 Fisheries in the NAC area

Canada

Gear and effort: Restrictions on commercial and recreational fisheries introduced in Canada in 1992 remained in force. In addition, further regulations were introduced in Labrador: in the commercial fishery the quota was reduced from 92 t to 73.5 t, the opening date was delayed and the season was reduced in length; in the recreational fishery the number of large salmon that could be retained was reduced from 2 to 1.

Catch: The provisional landings for Canada in 1995 were 270 t, a reduction of 24% from 1994 (Table 1.1.1). The landings of small salmon (72,389) and large salmon (33,224) represented reductions of 6% and 23% respectively from 1994. First People's landings were 78% of their 1994 landings and 10% below the previous 5 year mean. The recreational landings totalled 65,862 small and large salmon, the second lowest total recorded since 1974. The commercial landings in Labrador and Quebec declined

to less than 100 t in 1995 from a peak of more than 2,400 t in 1980. The increased restrictions were partly responsible for the reduction in catches.

Composition and origin of catch: No tagged fish of USA origin were reported from Canadian fisheries in 1995.

Returns to the majority of rivers in Newfoundland and Labrador comprised exclusively wild salmon. Hatchery origin fish were most abundant in returns to rivers in the Bay of Fundy and the Atlantic coast of Nova Scotia.

Aquaculture escapees were found in samples from a number of rivers in the Bay of Fundy, in the Conne River, Newfoundland, and in at least one river from Cape Breton. Approximately 90% of the salmon caught in the Macaguadavic River were of aquaculture origin in 1995.

USA

The retention of sea-run Atlantic salmon was prohibited in 1995 (from 9 June in the State of Maine) and the sport fishery was restricted to catch and release. As a result there were no landings of salmon. A total of 370 salmon were caught and released, a 41% increase over 1994.

France (Saint-Pierre and Miquelon Island)

The harvest of salmon by commercial nets was 414 kg. No estimate of the harvest by recreational nets is available.

1.3.2 Status of stocks in the NAC area

The North American Run-Reconstruction Model was used to update the estimates of pre-fishery abundance of non-maturing and maturing 1SW salmon from 1971–1995. The 1994 estimate of pre-fishery abundance of non-maturing 1SW salmon was the lowest on record (Figure 1.3.1). The 1995 estimate of pre-fishery abundance of maturing 1SW salmon is slightly below that of 1994 and the lowest on record. The results suggest at best a levelling off of a decline to historical low levels. In addition to the steady decline in recruits over the last 10 years, there has been a steady increase in the proportion of the North American stock maturing as 1SW fish. This proportion has risen from about 45% at the beginning of the 1970s to around 70% in the last three years.

The estimate of the total number of 1SW salmon returning to Labrador and Newfoundland rivers and coastal waters of other areas of North America in 1995 is slightly lower than the estimate for 1994 and is the fifth lowest observed in the time series, 1971–1995. The estimates of returns were quite variable before 1988 and subsequently declined to the 1995 level. The estimate of 2SW returns is slightly above the estimates for 1993 and 1994 but well below levels in the 1970s (Figure 1.3.2).

The rank of the estimated returns in 1995 in the 1971–1995 time series for six regions in North America is shown below:

Region	Rank of 1995 returns in 1971-95 time series (1=highest)		Mid-point estimate of 2SW spawners as proportion of escapement target
	1SW	2SW	(%)
Labrador	18	1	69
Newfoundland	15	11	120
Quebec	14	24	30
Gulf	24	17	105
Scotia-Fundy	23	24	31
USA	17	19	6

In most regions the returns of both 1SW and 2SW fish are near the lower end of the 25 year time series. However, returns of 2SW salmon to Labrador in 1995 were the best in the time series.

The text table above also shows the estimated total spawning escapement of 2SW salmon in each region expressed as a percentage of the spawning escapement target. Only in Newfoundland and the Gulf of St. Lawrence were targets exceeded in 1995. The overall 2SW spawning escapement target for Canada could have been met or exceeded in only 3 of the past 25 years (considering the mid-points of the estimates) (1974, 1977 and 1980). In the remaining years, spawning targets could not have been met even if all in-river harvests had been eliminated.

The majority of the USA returns were recorded in the rivers of Maine, with the Penobscot River accounting for about 76% of the total. Salmon returns to the Penobscot River were 29% higher than the previous year, but were 35% lower than the previous 5-year average and 50% lower than the previous 10-year average.

Egg depositions exceeded or equalled the specific river targets in 22 of the 73 rivers which were assessed in Canada and were less than 50% of target in 22 other rivers. Large deficiencies in egg depositions were noted in the Bay of Fundy and Atlantic coast of Nova Scotia where 10 of the 12 rivers assessed had egg depositions which were less than 50% of target (Figure 1.3.3).

The implications of these observations for the management of salmon stocks in the NAC and WGC areas are discussed in Section 4.

1.3.3 Possible predators and natural mortality of salmon in the NAC area

One cause of natural mortality in the sea is predation, but little is known about levels on salmon stocks. However, there is good evidence that marine mammals, especially seals, prey on salmon at some stage in their life. Grey, harbour, and ringed seals are known predators on salmon and all of these species occur in Canada. In 1993, the Canadian grey seals population was estimated to be 144,000 (82,000 from the Sable Island rookery off Nova Scotia and 62,000 from the Gulf of St. Lawrence) and increasing at 13% and 8% per year in the two areas respectively. The population of

grey seals in Maine, USA, has increased from approximately 30 animals in 1980 to between 600–1,200 in recent years.

Various fish species may also prey on salmon in marine areas. The successful striped bass (*Morone saxatilis*) restoration programme along the east coast of the USA has resulted in the possibility of increased predation upon Atlantic salmon smolts.

Studies suggest that cormorants and mergansers may consume substantial numbers of juvenile salmon in New Brunswick, Nova Scotia and Prince Edward Island, at least at some times and places. Cormorants are estimated to have consumed less than 7% of the hatchery-reared smolts stocked in the Penobscot River during the period 1992–1994, and most of the predation occurred in the head ponds of various mainstream hydro dams.

Available estimates of the natural mortality throughout the marine phase of the life cycle for North American stocks vary from around 95% (e.g. Western Arm Brook wild salmon) to over 99% (Penobscot River hatchery-reared salmon). Estimates of natural mortality rates indicate increasing trends in several North American stocks. Mortality rates are generally higher and more variable for hatchery than wild stocks.

1.3.4 Data deficiencies and research needs in the NAC area

Possible reasons for the apparent declines in 2SW returns to SFAs 15–23 and Q1–Q10 need to be evaluated.

Estimates should be developed of total recruits prior to all fisheries for each SFA for which estimates have not been made.

There is a need for improved habitat surveys for rivers in Labrador so that spawner requirements can be developed based on habitat characteristics.

The possible changes in the biological characteristics (mean weight, sex ratio, sea-age composition) of returns to rivers, spawning stocks, and total recruits prior to fisheries should be reviewed. As new information becomes available, estimates of spawning requirements in USA and Canada should be refined by incorporating new information such as on biological characteristics for individual stocks, habitat measurements and stock and recruitment analysis.

Annual estimates of smolt-to-adult salmon survival rates need to be obtained for Labrador, New Brunswick and Nova Scotia.

Sea survival rates of hatchery and wild salmon should be examined to determine if changes in survival of hatchery releases can be used as an index of sea survival of wild salmon.

1.4 Fisheries and Stocks in the West Greenland Commission (WGC) Area

1.4.1 Fishery in WGC area

Catch: After the suspension of the commercial fishery in 1993 and 1994, the salmon fishery at West Greenland (NAFO Sub-area 1) was re-opened for the period 14 August–15 October 1995. However, catches in the first two weeks approached the full quota (77 t) and so the fishery was closed on 1 September. The preliminary nominal catch figure is 68 t (Table 1.1.1) which is the lowest recorded catch since 1960 (excluding the years when fishing was suspended).

There have been no surveys of the landings taken for local consumption in the WGC area. Calculations based on tagging experiments in the Penobscot River, USA, suggest that these landings could be substantially greater than the 10–12 t given in Section 1.1.2, but there are some uncertainties about this analysis. There is therefore a need for independent survey data to support the results and further studies are encouraged.

Gear and effort: Only vessels of less than 42 ft (<12.8 m) were permitted to participate in the commercial salmon fishery in Greenland coastal waters in 1995. The commercial fishery was conducted under quotas, distributed at the community level and assessed through daily licensee reports to the License Control Office. Entry into the fishery was limited to professional fishers or hunters, fishing their own gear (single hook and line; 2,000 knot, 140 mm stretched mesh fixed or drifting gill net of any length) within 40 nautical miles of the west coast or 12 nautical miles of the east coast. Licences for salmon fishing are not issued to vessels with licences for the shrimp fishery.

Fishing for private consumption was restricted to residents of Greenland, using hook and line or a single fixed, 2,000 knot, 140 mm stretched mesh gill net, or a similar 30 fathom drift net, tended daily. Salmon taken by this fishery were not permitted to be sold and were not counted against the quota.

Permits may be issued for tourists to fish with hook only. There is no daily catch limit but the catch may not be sold. Few tourist licences were sold.

Origin of catches: Based on a discriminant analysis of characteristics from scale samples collected in the fishery in 1995 it was estimated that 65% were of North American origin (PropNA) compared with 54% in 1992. This proportion is the second highest in the time series since 1969, and there has been an increasing trend over the period.

Applying the discriminant function to the reported catch indicated that 43 t (17,200 salmon) of North American origin and 25 t (9,250 salmon) of European origin were landed at West Greenland in 1995.

Biological characteristics of the catch: The 1SW salmon of North American origin were significantly shorter and lighter than the European-origin salmon. The 2SW salmon of European-origin were significantly lighter and shorter than the 2SW North American-origin salmon.

The downward trend in mean length of both European and North American 1SW salmon since 1969 continued in 1995. The mean length of European 1SW fish (62.6 cm) was the shortest observed in the 1969–1995 series. The mean length of North American 1SW fish (62.1 cm) was the same as that recorded in 1985, and is the lowest value observed in the series. Similar observations were made for the mean weights of 1SW salmon at West Greenland in 1995.

The proportion of the European origin salmon that were river-age-1 (14.7%) was well below the mean of 20.1% for the period 1969–1995, while the proportion of river-age-3 fish (27.5%) was greater than the mean of 16.8%. This may indicate some change in the stock composition in the area. Proportions of river ages of North American origin salmon were not appreciably different from the 1968 to 1992 means.

1.4.2 Status of stocks in the WGC area

The salmon caught in the West Greenland area are non-maturing 1SW salmon or older, nearly all of which would return to homewaters in Europe or North America as MSW fish if they survived. The European stocks making the greatest contribution to the fisheries in West Greenland are thought to originate from the UK and Ireland.

Returns of the MSW component of most of these stocks to homewaters have declined during the past 5 years (see Section 1.2.3). Similar declines in abundance have been noted in many North American MSW stocks that contribute to the West Greenland fishery (see Section 1.3.2). The overall status of stocks contributing to the West Greenland fishery remains poor, and as a result, the status of stocks within the West Greenland area is thought to be low compared to historical levels.

Stocks originating in North-East Atlantic: There are well over 1,000 rivers supporting salmon in the NEAC area, but for most of these there is no information on the status of the stocks.

Minimum biologically acceptable levels (MBAL) have been established for 7 river stocks in the NEAC area. As yet, spawning targets have not been established for these stocks.

In three of the stocks, egg deposition exceeded MBAL in 1995 and in a fourth it was within 10% of MBAL. In the remaining three rivers egg deposition was less than 70% of the MBAL. Of the five rivers for which data were available for at least 10 years, three exceeded the reference egg deposition level in at least 72% of years while the other two failed to meet their reference levels in at least 77% of the years.

Examination of the general trends suggests that there has been no significant change in smolt production in the North-East Atlantic as a whole. Adult runs in western European rivers appear to be increasing or at least remaining stable, probably due to lower exploitation in recent years.

Survival indices to homewaters for both wild and hatchery reared 1SW and 2SW stocks showed a downward trend over the past decade. The wild and hatchery reared 2SW stocks also showed a decrease over the last 5 years.

Stocks originating in North America: The North American Run-Reconstruction Model was used to update the estimates of pre-fishery abundance of non-maturing and maturing 1SW salmon from 1971–1995. The 1994 estimate of pre-fishery abundance of non-maturing 1SW salmon was the lowest on record (Figure 1.3.1). The 1995 estimate of pre-fishery abundance of maturing 1SW salmon is slightly below that of 1994 and the lowest on record. The results suggest at best a levelling off of a decline to historical low levels. In addition to the steady decline in recruits over the last 10 years, there has been a steady increase in the proportion of the North American stock maturing as 1SW fish. This proportion has risen from about 45% at the beginning of the 1970s to around 70% in the last three years.

The estimate of the total number of 1SW salmon returning to Labrador and Newfoundland rivers and coastal waters of other areas of North America in 1995 is slightly lower than the estimate for 1994 and is the fifth lowest observed in the time series, 1971–1995. The estimates of returns were quite variable before 1988 and subsequently declined to the 1995 level. The estimated 2SW returns are slightly above the returns for 1993 and 1994 but well below levels in the 1970s (Figure 1.3.2).

The rank of the estimated returns in 1995 in the 1971–1995 time series for six regions in North American is shown below:

Region	Rank of 1995 returns in 1971-95 time series (1=highest)		Mid-point estimate of 2SW spawners as proportion of escapement target
	1SW	2SW	(%)
Labrador	18	1	69
Newfoundland	15	11	120
Quebec	14	24	30
Gulf	24	17	105
Scotia-Fundy	23	24	31
USA	17	19	6

In most regions the returns of both 1SW and 2SW fish are near the lower end of the twenty five year time series. However, returns of 2SW salmon to Labrador in 1995 were the best in the time series.

The text table above also shows the estimated total spawning escapement of 2SW salmon in each region expressed as a percentage of the spawning escapement target. Only in Newfoundland and the Gulf of St. Lawrence were targets exceeded in 1995. The overall 2SW spawning escapement target for Canada could have been met or exceeded in only 3 of the past 25 years (considering the mid-points of the estimates) (1974, 1977 and 1980). In the remaining years, spawning targets could not have been met even if all in-river harvests had been eliminated.

The majority of the USA returns were recorded in the rivers of Maine, with the Penobscot River accounting for about 76% of the total. Salmon returns to the

Penobscot River were 29% higher than the previous year, but were 35% lower than the previous 5-year average and 50% lower than the previous 10-year average.

Egg depositions exceeded or equalled the specific river targets in 22 of the 73 rivers which were assessed in Canada and were less than 50% of target in 22 other rivers. Large deficiencies in egg depositions were noted in the Bay of Fundy and Atlantic coast of Nova Scotia where 10 of the 12 rivers assessed had egg depositions which were less than 50% of target (Figure 1.3.3).

1.4.3 Data deficiencies and research needs in the WGC area

The mean weights, sea ages and proportion of fish originating from North America and Europe are essential parameters used by ICES to provide catch advice for the West Greenland fishery. It should be emphasized that these parameters have changed in the past and thus that they should be updated with new data periodically to ensure the greatest possible accuracy in the quota calculation.

Efforts should be made to improve the annual estimates of the harvest of salmon taken for local consumption at West Greenland.

2. RECENT RESEARCH DEVELOPMENTS

2.1 Possible Explanations for Changes in Sea-Age at Maturity

The sea-age at which each salmon becomes sexually mature is determined by both genetic and environmental factors. In a biological context, environment is defined to include all sources of non-genetic variation affecting growth, development and sexual maturity. Effects evident in the fisheries or among spawners may be caused by factors affecting the fish at any earlier stage.

In many populations and stocks males are more prevalent among 1SW fish than females and females predominate in the older classes.

Assessing the relative importance of environmental or genetic effects on sea-age at maturity in natural stocks or populations is difficult because the effects are not independent. Complex patterns of variation may result from interactions between factors at different stages of the life-cycle.

The relatively large estimates of heritability in aquaculture fish strongly suggest that a substantial genetic component is likely to exist for sea-age at maturity in all salmon - including wild salmon in natural environments.

The physical environment is likely to affect sea-age at maturity mainly through somatic growth which in turn affects the events that lead to sexual development. Growth and development in each successive phase of life is partly related to the outcome of earlier phases. Indeed, sea-age at maturity may be affected by juvenile development

The sexes differ in their tendency to become mature at particular ages in fresh water and in the sea. Many males become sexually mature as parr. Parr maturity is

associated with additional natural mortality that causes the sex ratio among smolts to be biased in favour of females.

Fisheries that occur at particular times of year or that are size selective may select fish of a particular sea-age. Because of the genetic component in sea-age at maturity this will also alter the genetic composition of populations at spawning. The genetic make up of the next generation can therefore be affected by fisheries. The magnitude of these changes will be related to the intensity of the fisheries, the extent of the bias of fishery mortality on the different sea-age classes and the magnitude of the genetic effect being expressed in sea-age at maturity.

2.2 Criteria for Defining Salmon Stocks

The salmon's homing behaviour results in relatively closed groups of individuals returning to reproduce in their natal rivers. Within any given river, subgroups may also develop (e.g. within tributaries). Natural selection acts to adapt the stocks to the conditions they will face in the home river and along their migration routes, and they become the best equipped to survive and reproduce. The subgroups which occur within the same river system are best described as 'Mendelian populations'.

There is a need to define management units encompassing one or more such populations as a practical basis for fishery management while still helping to ensure the conservation of the contributing populations. These units may be termed "stocks" and should be defined by managers after considering the following criteria *(No attempt has been made to prioritise these concerns)*:

1. The number and size of populations in the fishery area - (i.e. the more populations, the greater the risk of over-exploiting any individual population).

2. The proportion of fish from each population in the area - (i.e. this will affect the relative levels of exploitation on each population).

3. The number of fish in each population required to meet spawning targets - (i.e. more productive stocks or stocks experiencing less natural mortality can be exploited more heavily).

4. The proposed levels of exploitation on each population - (i.e. at high exploitation rates, smaller stock units are required to protect individual populations).

5. The percent of catches that are expected to be taken in mixed stock fisheries in distant and homewaters, and/or in-river fisheries (i.e. if a lower percentage of the total catch is taken in mixed stock fisheries, then larger stock units may be used).

6. Population structures and distribution (i.e. populations with greater temporal and spatial distribution are less vulnerable to the risk of extinction caused by local changes in natural or fishing mortality).

7. The probability of making management errors due to unanticipated or unavoidable events (e.g. errors in assessments, unpredictable shifts in environmental conditions, etc.).

8. Jurisdictional considerations (e.g. competing claims for resource use, problems in mounting effective enforcement).

2.3 A New Method for Identifying Reared Salmon

In Norway more than 90% of the farmed salmon are vaccinated as pre-smolts using intra-peritoneal injections of oil adjuvanted vaccines. A Norwegian study has shown that intra-peritoneal vaccination in commercial rearing produces a visible marker permitting simple and rapid discrimination of farmed and wild salmon on internal examination. This could be a valuable method for estimating the contribution of reared fish to fisheries and stocks.

2.4 Use of Strontium:Calcium Ratios in Otoliths to Determine Maturation Status

Elements may be differentially deposited in the otoliths of salmon during their life in response to changes in environmental variables such as temperature and salinity or physiological mechanisms, such as growth and maturation. In the case of maturation, chemical composition of otoliths may reflect sexual readiness and spawning events and thus provide a record of the variation that occurs between individuals and populations.

Salmon caught in Greenland were found to have declining strontium:calcium ratios in the outer zones of their otoliths. The ratios for immature fish suggested that sexual readiness was achieved during the feeding migration and that maturation regression occurred in the absence of cues to begin a spawning migration. Maturing fish were found to have similar Sr:Ca ratios to the immature fish of the same stock during the post-smolt period. A hypothesis has been developed that post-smolts that make a northerly migration after their first sea winter are influenced by environment not to mature as 1SW fish.

3. EVALUATION OF THE EFFECTS OF SOME MANAGEMENT MEASURES ON THE STOCKS AND FISHERIES OCCURRING IN THE RESPECTIVE COMMISSION AREAS

3.1 Quota Management and Closures Implemented after 1991 in the Canadian Commercial Salmon Fisheries

Newfoundland: The effect of the five-year moratorium on the commercial salmon fishery in insular Newfoundland in 1992 was evaluated by estimating the number of fish that would not have returned if the measures had not been taken. These estimates are summarised below:

	Total returns		Salmon saved due to closure	
Year	Small salmon	Large salmon	Small salmon	Large salmon
	(,000)	(,000)	(,000)	(,000)
1992	116-232	16-32	58-116	11-22
1993	131-262	8-16	66-131	6-11
1994	95-191	8-16	48-92	6-11
1995	111-224	9-18	56-112	6-13

There were significant increases in returns of small and large salmon in SFAs 4, 5, and 14A in years since the moratorium, 1992–1995, compared with the pre-moratorium period. For southern SFAs (SFAs 9–11) returns of small and large salmon decreased in three rivers and increased in three rivers. These results imply that southern stocks may not have benefited by the closure of the fisheries to the same extent as northern stocks. However, other factors such as natural mortality may have contributed to the decline in returns. The proportion of large salmon increased at all monitoring facilities in SFAs 4, 5, 10, 13, and 14A; however, decreases in this proportion were observed in three of the four rivers in SFAs 9 and 11.

Smolt to adult survival rates increased for several rivers, which is consistent with a decline in marine fishing mortality.

Labrador: Changes in the exploitation rates in the commercial fishery in Labrador since 1992 have been estimated, based on the reduction in fishing effort (indexed by number of fishing licences) and assumed levels of exploitation in 1991:

Year	Exploitation rate Small salmon	Exploitation rate Large salmon
1991	0.3 - 0.5	0.7 - 0.9
1992	0.22 - 0.39	0.58 - 0.83
1993	0.13 - 0.25	0.38 - 0.62
1994	0.1 - 0.2	0.25 - 0.43
1995	0.08 - 0.15	0.1 - 0.33

Levels of exploitation on salmon returning to the Sandhill River (SFA 2) have been observed to have declined in 1994 and 1995 compared with the early 1970s as a result of various changes in the fisheries, as shown below:

	Exploitation rate	
	1970–1973	**1994–1995**
Small salmon	0.62	0.12
Large salmon	0.95	0.45

These reductions in exploitation rates in Labrador would imply that the returns to the rivers in 1993–1995 were two to three times greater than would have occurred if there had been no management changes.

The effect of the shortened season on salmon landings in Labrador in 1995 was estimated by examining the temporal pattern of catches in 1993–1994. The estimated reductions are summarised below:

Reduction in landings resulting from shortened season				
SFA	**Small salmon**		**Large salmon**	
	%	t	%	t
1	0.8%	<1	91.5	<1
2	19.1%	2	52.0	27
14B	16.1%	<1	50.8	1

Thus, the shorter 1995 commercial salmon fishing season in Labrador may have resulted in a reduction in landings of 1,026 small salmon (2.2 t) and 7,485 large salmon (29.4 t), an overall reduction in landings of 36%.

Quebec: The closure of the commercial fishery on the Quebec North Shore fishery in 1994 is estimated to have resulted in 86–121 small salmon and 866–1103 large salmon not being caught, assuming that exploitation rates in 1995 would have been the same as in 1990–1992, if there had been no management change.

Other Areas: Although the Newfoundland and Labrador commercial salmon fisheries used to harvest small and large salmon with origins in Nova Scotia, New Brunswick, Quebec, and USA, increases in returns to these provinces cannot be quantified. The estimates of returns of 2SW salmon to SFAs 19–23, Q1–Q11, and USA from 1992–1995 are lower than the returns in 1987–1991 which is inconsistent with a reduction in marine fishing mortality.

3.2 Suspension of Commercial Fishing Activity at the Faroes Since 1991

Since 1991, the Faroese fishermen have agreed to suspend commercial fishing for the salmon quota set by NASCO in exchange for compensation payments. The number of fish saved from the fishery is estimated by subtracting the numbers of fish killed in the research fishery from the number that are expected to have been killed if the commercial fishery had operated. The increase in returns to all homewaters is then

estimated by subtracting the fish that would have died on their homeward migration. The great majority of these would be expected to return to European rivers although a small number of salmon tagged in the fishery have returned to North America. The expected catch in the Faroese fishery was estimated to be equal to the mean catch in the 1988/1989 to 1990/1991 seasons, a slightly different approach to that used in the ICES advice to NASCO in 1995. The estimates of the increased returns to homewaters in Europe for the years 1992–1995 are shown below:

Year	Increased returns to homewaters in Europe	
	1SW	MSW
1992	1,618	40,327
1993	5,852	55,466
1994	9,967	64,207
1995	6,412	67,936

In addition, nearly 90,000 escaped farmed fish are expected to have been saved from the Faroes fishery over the four seasons of the suspension. It is not known whether these fish will have returned to the areas from which they escaped.

The numbers of 1SW fish saved is very small and will have increased returns to all European rivers by less than 1%. The expected increase in returns of MSW salmon will have increased from 2–5% in 1992 to 5–10% in 1995. However, the majority of these fish are believed to have returned to Scandinavia, Finland and Russia (perhaps 75%). The estimated increase in the number of returns to these countries is therefore as summarised below:

Year	Estimated proportion of MSW salmon returning to Scandinavia, Finland and Russia derived from suspension of Faroes fishery	
	number	%
1992	30,245	3 - 7 %
1993	41,600	5 - 9 %
1994	48,155	7 - 13 %
1995	50,952	7 - 14 %

Although the additional returning fish are expected to have contributed to catches and spawning stocks, it appears that any increase in catches has been too small to be detected as a statistically significant change above the normal annual variation or has been masked by other factors such as reduced marine survival or reduced exploitation rates in homewaters.

3.3 Suspension of Commercial Fishing Activity During 1993 and 1994 at West Greenland

The fishermen at West Greenland suspended commercial salmon fishing in 1993 and 1994 in accordance with an agreement between the Organisation of Hunters and Fishermen in Greenland and the North Atlantic Salmon Fund, although a small subsistence fishery was allowed to continue. The number of salmon saved from the fishery as a result of the 213 t and 157 t quotas not being taken in the West Greenland fishery in 1993 and 1994 is estimated from the quotas and the means weights of fish in the fishery. This number is adjusted to take account of non-catch fishing mortality and then divided into North American and European groups using the proportions obtained from the sampling programme. The increase in returns to homewaters in 1994 and 1995 is estimated by subtracting the fish that would have died on their homeward migration and is shown below:

	Increased returns of MSW salmon	
Year	**N America**	**Europe**
1994	44,524	37,928
1995	33,236	28,312

The estimates provided by ICES in 1995 were smaller than this because they only included 2SW fish and did not take account of non-catch fishing mortality.

The additional returns of 2SW salmon to North America represented 30–52% of the total estimated returns of 2SW fish in 1994 and 21–38% in 1995.

The results of smolt tagging experiments conducted over the past 25 years and adult tagging studies in the early 1970s suggest that the majority of the European fish would have returned to rivers in southern Europe. Assuming that all of the saved wild European salmon returned to Southern European countries (UK, Ireland, France and Spain) they will have represented about 5–10% of the returns of MSW fish in 1994, and 4–9% in 1995.

Although the additional returning fish are expected to have contributed to catches and spawning stocks, it appears that any increase in catches has been too small to be detected as a statistically significant change above the normal annual variation or has been masked by other factors such as reduced marine survival or reduced exploitation rates in homewaters.

4. MANAGEMENT CONSIDERATIONS FOR THE NORTH AMERICAN AND WEST GREENLAND COMMISSION AREAS

Management advice for salmon stocks in the NAC and WGC areas is based upon spawning escapement targets to provide optimum smolt production.

4.1 Review of Age Specific Target Spawning Levels in Canadian Rivers

The revised 2SW spawning escapement target for the whole of North America is 180,495, a decrease of 3% from the previous estimate (186,486). The target number of 2SW spawners for Canada has been revised to 151,296 on the basis of an extensive review of the best available information. This represents a marginal decrease (4%) from the target of 157,287 used in 1995. Most (84%) of the 2SW North American target spawner escapement arises from rivers in Canada.

A theoretical analysis of the probabilities of achieving female spawning escapement for different stock sizes and stock complexes was also examined. To reduce the risk of female spawner under-escapement, more fish must be released, the additional releases being a relatively decreasing proportion of the target escapement level for the river as the size of the stock (target number of fish) increases.

A similar analysis shows the effect of treating North American salmon as a single stock or as 6 or 24 stocks. The total spawning escapement required to have a 50% probability of achieving the female spawning target is 180,495 (equal to the target). If North American salmon are treated as 24 stocks (corresponding to the fishing areas in Canada plus USA) this number increases to 188,500 assuming all stocks were producing to their potential.

Consideration should therefore be given to the number of distinct stocks used to develop the catch advice for mixed stock fisheries.

4.2 Development of Catch Options with an Assessment of Risks Relative to the Objective of Achieving Target Spawning Escapement

Pre-fishery abundance forecast

ICES addressed the concern expressed previously that in the forecast model used in 1995 all of the residual values since 1988 had been negative, indicating that the actual values would be considerably lower than those predicted. ICES also wished to include a biological component in the model which was hitherto simply a regression model with a single environmental variable.

A revised model was developed which includes an index of potential smolt production from Canada. The index is based on the number of spawners in the years contributing to the smolt run in each region, weighted according to the mean age composition of the smolts produced in that region. Data for spawners from the Gulf of St. Lawrence region were not included. The spawning escapement in this region has exceeded the target level in recent years and variation in the numbers of spawners above this level would not be expected to affect smolt recruitment. Thermal habitat data for February alone have been used because this gives the lowest residuals in recent years. Although the new model still tends to overestimate the pre-fishery abundance in recent years (Figure 4.2.1, Table 4.2.1), the residuals from 1988–1994 were smaller and the R^2 slightly higher than those obtained from the 1995 model formulation.

The forecast estimate of pre-fishery abundance of non-maturing 1SW North American salmon for 1996 based on this model is 178,099. The probabilities that the 1995 forecasts are less than a particular value were estimated and are shown in Table 4.2.2.

Development of catch options for 1996

The procedure for estimating the quota for West Greenland is summarised in Appendix 2. In addition to the estimate of pre-fishery abundance, this calculation requires estimates of the proportion of the stock at West Greenland which is of North American origin [PropNA], mean weights of North American and European 1SW salmon [WT1SWNA and WT1SWE, respectively], and a correction factor for the expected sea age composition of the total landings [ACF]. Exponential smoothing model forecasts for 1996 utilising data collected during the 1995 fishery and using interpolated values for 1993 and 1994, with approximate 50% confidence limits, are summarised below:

Parameter	Forecast	Minus 1SE	Plus 1SE
PropNA	0.592	0.506	0.678
WT1SWNA	2.420	2.268	2.572
WT1SWE	2.620	2.430	2.810
ACF	1.133	1.030	1.236

Greenland quota levels for the forecast of pre-fishery abundance were computed with the revised model and are shown in Table 4.2.3 for different probable abundance levels and varying proportions of the harvestable surplus taken at West Greenland.

The 50% risk level is intended to produce spawning escapements in North America that will meet the summed target levels for all rivers 50% of the time. Even if this overall target is achieved (estimated to be a 50% probability), it is likely that some stocks will fail to meet their individual target spawner requirements while others will exceed target levels. This may result from random variation between years or from systematic differences in the patterns of exploitation on fish from different rivers or regions. In the latter case, adoption of a 50% probability level may result in some stocks failing to meet target levels over an extended period if the full TAC is harvested. This would be likely to result in the long-term decline in those stocks.

The table indicates that even with a zero TAC on non-maturing 1SW salmon the overall spawning target for North America 2SW salmon is not expected to be met.

Catch advice

It is evident from indicators of stock status, including the current and predicted estimates of pre-fishery abundance, that the North American stock complex is in a tenuous condition. We are observing record low abundance despite almost complete closures of mixed and single stock fisheries, a continuing trend of below target spawning escapements for 2SW salmon, and some of the lowest marine survival rates

for monitored stocks. If catch quotas are set as in 1995, by selecting the risk neutral level, the TAC will be zero. **ICES recommends that fishing mortality on salmon in the West Greenland and North American Commission areas should be reduced to the lowest possible level; and that there should be no landings of salmon from the West Greenland Commission area in 1996 and no landings of salmon from the North American Commission area in 1996 and 1997 except for in-river harvests from stocks in individual rivers which are above biologically-based escapement targets.**

5. MANAGEMENT CONSIDERATIONS FOR THE NORTH-EAST ATLANTIC COMMISSION AREA

Management advice for salmon stocks in the NEAC area is currently based partly upon estimates of the minimum biologically acceptable level for a number of stocks. Spawning escapement targets for management have not been specified.

5.1 Estimates of Age Specific Spawning Reference Levels and Spawning Escapement Targets

In Section 1.2, data are presented on 7 rivers for which reference spawning levels have been established in the NEAC area. Reference levels are being developed and should be available for all rivers in a number of countries in the next 1–3 years. However, little progress is being made in some other countries. **ICES recommends that if spawning escapement targets are to be used to develop management advice on the same basis as that derived for the North American stock all countries should establish preliminary spawning targets for all their rivers as soon as possible.**

5.2 Development of Catch Options

Pre-fishery abundance estimates for the NEAC area

ICES revised and extended the preliminary estimates of the pre-fishery abundance of maturing and non-maturing 1SW salmon in the NEAC area prepared in 1995. Figures 5.2.1–5.2.4 show the range of estimates of the pre-fishery abundance of maturing and non-maturing 1SW salmon in the NEAC area for the period 1970 to 1994 for northern and southern European stocks as defined below:

Southern European countries:	Northern European countries:
Ireland	Iceland
France	Finland
UK (England & Wales)	Norway
UK (Northern Ireland)	Russia
UK (Scotland)	Sweden

Overall it appears that both maturing and non-maturing components of the Southern European group have declined, with the non-maturing component declining more rapidly (Figures 5.2.1 and 5.2.2). These stocks are probably at their lowest level in the last 25 years. The maturing 1SW component from Northern European countries has remained relatively stable, although abundance may have been reduced in 1978 and 1982 rapidly (Figures 5.2.3 and 5.2.4). The non-maturing 1SW component appears to have declined in 1977, then increased rapidly to 1980 and declined again thereafter, probably to its lowest level in 25 years.

Relationship between thermal habitat and pre-fishery abundance of European stocks

ICES conducted an exploratory analysis of the effect of thermal habitat on the southern European non-maturing 1SW stock component. The area of 6 to 8°C water between Iceland and Greenland (29°W to 51°W) in the winter months was well correlated with the pre-fishery abundance (Figure 5.2.5). The regression line between abundance and habitat reveals a strong positive relationship with reasonable confidence limits on the regression (Figure 5.2.6). This relationship is remarkably similar to that observed for the North American non-maturing stock complex. However, there are a number of statistical issues that need to be addressed before these data can be applied in predictive models.

Catch advice

In view of the apparent decline in pre-fishery estimates to the lowest levels historically observed for maturing and non-maturing 1SW salmon in Southern European countries, non-maturing 1SW salmon in Northern European countries and near-lowest levels for maturing 1SW salmon in Northern Europe, it appears that these stocks in aggregate may be below minimum biologically acceptable levels (MBAL). The tenuous condition of these stocks is reinforced by downward trends in indices of survival from smolts to homewaters for wild and reared 1SW and 2SW stock components over the past decade and an increase in the proportion of maturing 1SW fish in the fisheries. These conditions are similar to those of North American stocks. **ICES recommends that, except for in-river fisheries on stocks in individual rivers which are above MBAL, measures should be introduced to reduce fishing mortality and increase escapement of salmon in the North-East Atlantic, especially for that component which spawns as multi-sea-winter fish.**

6. COMPILATION OF TAG RELEASE AND FINCLIP DATA FOR 1995

Data on releases of tagged and finclipped salmon in 1995 were provided by ICES and will be compiled as a separate report. In 1995, a total of just over 3.35 million salmon were marked and released, a substantially lower number than in 1994 (4.42 million). Most marks were applied to reared parr and smolts (3.27 million) and with only small numbers of wild parr and smolt (0.065 million) and adult fish (0.021 million) being marked.

APPENDIX 1

DECISION OF THE COUNCIL OF NASCO TO REQUEST SCIENTIFIC ADVICE FROM ICES

With respect to Atlantic salmon in each Commission area:

a) describe the events of the 1995 fisheries,

b) describe the status of the stocks and, where appropriate, evaluate the causes for any changes in salmon abundance with special reference to changes in natural mortality,

c) identify data deficiencies and research requirements relevant to the management of salmon stocks;

2) Report on significant research developments which might assist NASCO with the management of salmon stocks, with special reference to:

a) possible explanations for changes in sea-age at maturity of Atlantic salmon,

b) the criteria for defining salmon stocks;

3) Update the evaluation of the effects of the following measures on the stocks and fisheries occurring in the respective Commission areas:

a) quota management and closures implemented after 1991 in the Canadian commercial salmon fisheries,

b) the suspension of commercial fishing activity at the Faroes since 1991,

c) the suspension of commercial fishing activity during 1993 and 1994 at West Greenland;

4) With respect to the fishery in the West Greenland Commission area:

a) review the age specific target spawning levels in Canadian rivers,

b) provide catch options with an assessment of risks relative to the objective of achieving target spawning escapement;

5) With respect to fisheries and stocks in the North-East Atlantic Commission area:

a) provide estimates of age specific spawning targets,

b) provide catch options with an assessment of risks relative to the objective of achieving target spawning escapement;

6) With respect to Atlantic salmon in the NASCO area, provide a compilation of microtag, finclip and external tag releases by ICES Member Countries in 1995.

APPENDIX 2

COMPUTATION OF CATCH ADVICE FOR WEST GREENLAND

The North American Spawning Target (SpT) for 2SW salmon has been revised to 180,495 fish in 1996.

This number must be divided by the survival rate for the fish from the time of the West Greenland fishery to their return of the fish to home waters (11 months) to give the Spawning Target Reserve (SpR). Thus:

Eq. 1. SpR = SpT * (exp(11*M) (where M = 0.01)

The Maximum Allowable Harvest (MAH) may be defined as the number of non-maturing 1SW fish that are available for harvest. This number is calculated by subtracting the Spawning Target Reserve from the pre-fishery abundance (PFA).

Eq. 2. MAH = PFA - SpR

To provide catch advice for West Greenland it is then necessary to decide on the proportion of the MAH to be allocated to Greenland (f_{NA}). The allowable harvest of North American non-maturing 1SW salmon at West Greenland NA1SW) may then be defined as

Eq. 3. $NA1SW = f_{NA} * MAH$

The estimated number of European salmon that will be caught at West Greenland (E1SW) will depend upon the harvest of North American fish and the proportion of the fish in the West Greenland fishery that originate from North America [PropNA] [1]. Thus:

Eq. 4. E1SW = (NA1SW / PropNA) - NA1SW

To convert the numbers of North American and European 1SW salmon into total catch at West Greenland in metric tonnes, it is necessary to incorporate the mean weights (kg) of salmon for North America [WT1SWNA][1] and Europe [WT1SWE][1] and age correction factor for multi-sea winter salmon at Greenland based on the total weight of salmon caught divided by the weight of 1SW salmon [ACF][1] . The quota (in tonnes) at Greenland is then estimated as

Eq. 5. Quota = (NA1SW * WT1SWNA + E1SW * WT1SWE) * ACF/1000

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[1] New sampling data from the 1995 fishery at West Greenland were used to update the forecast values of the proportion of North American salmon in the catch (PropNA), mean weights by continent [WT1SWNA, WT1SWE] and the age correction factor [ACF] in 1996.

Table 1.1.1 Nominal catch of SALMON by country (in tonnes round fresh weight), 1960-1995. (1995 provisional figures).

Year	Canada (1)	Den.	Faroes	Finland	France	East Grld.	West Grld. (2)	Iceland	Ireland (3, 4)	Norway (5)	Russia	Spain (6)	St. P. & M.	Sweden (West)	UK (E & W)	UK N.Ireland (4,7)	UK (Scotland)	USA	Other (8)	Total Reported Catch	Unreported catches NASCO Areas	Unreported catches International waters (9)	Total Catch
1960	1636	-	-	-	-	-	60	100	743	1659	1100	33	-	40	283	139	1443	1	-	7237	-		-
1961	1583	-	-	-	-	-	127	127	707	1533	790	20	-	27	232	132	1185	1	-	6464	-		-
1962	1719	-	-	-	-	-	244	125	1459	1935	710	23	-	45	318	356	1738	1	-	8673	-		-
1963	1861	-	-	-	-	-	466	145	1458	1786	480	28	-	23	325	306	1725	1	-	8604	-		-
1964	2069	-	-	-	-	-	1539	135	1617	2147	590	34	-	36	307	377	1907	1	-	10759	-		-
1965	2116	-	-	-	-	-	861	133	1457	2000	590	42	-	40	320	281	1593	1	-	9434	-		-
1966	2369	-	-	-	-	-	1370	106	1238	1791	570	42	-	36	387	287	1595	1	-	9792	-		-
1967	2863	-	-	-	-	-	1601	146	1463	1980	883	43	-	25	420	449	2117	1	-	11991	-		-
1968	2111	-	5	-	-	-	1127	162	1413	1514	827	38	-	20	282	312	1578	1	403	9793	-		-
1969	2202	-	7	-	-	-	2210	133	1730	1383	360	54	-	22	377	267	1955	1	893	11594	-		-
1970	2323	-	12	-	-	-	2146	195	1787	1171	448	45	-	20	527	297	1392	1	922	11286	-		-
1971	1992	-	-	-	-	-	2689	204	1639	1207	417	16	-	18	426	234	1421	1	471	10735	-		-
1972	1759	-	9	32	34	-	2113	250	1804	1568	462	40	-	18	442	210	1727	1	486	10955	-		-
1973	2434	-	28	50	12	-	2341	256	1930	1726	772	24	-	23	450	182	2006	2.7	533	12770	-		-
1974	2539	-	20	76	13	-	1917	225	2128	1633	709	16	-	32	383	184	1708	0.9	373	11957	-		-
1975	2485	-	28	76	25	-	2030	266	2216	1537	811	27	-	26	447	164	1621	1.7	475	12236	-		-
1976	2506	-	40	66	9	<1	1175	225	1561	1530	772	21	2.5	20	208	113	1019	0.8	289	9557	-		-
1977	2545	-	40	59	19	6	1420	230	1372	1488	497	19	-	10	345	110	1160	2.4	192	9514	-		-
1978	1545	-	37	37	20	8	984	291	1230	1050	476	32	-	10	349	148	1323	4.1	138	7682	-		-
1979	1287	-	119	26	10	<1	1395	225	1097	1831	455	29	-	12	261	99	1076	2.5	193	8118	-		-
1980	2680	-	536	34	30	<1	1194	249	947	1830	664	47	-	17	360	122	1134	5.5	277	10127	-		-
1981	2437	-	1025	44	20	<1	1264	163	685	1656	463	25	-	26	493	101	1233	6	313	9954	-		-
1982	1798	-	865	54	20	<1	1077	147	993	1348	354	10	-	25	286	132	1092	6.4	437	8644	-		-
1983	1424	-	678	58	16	<1	310	198	1656	1550	507	23	3	28	429	187	1221	1.3	466	8755	-		-
1984	1112	-	628	46	25	<1	297	159	829	1623	593	18	3	40	345	78	1013	2.2	101	6912	-		-
1985	1133	-	566	49	22	7	864	217	1595	1561	659	13	3	45	361	98	913	2.1	-	8108	-		-
1986	1559	-	530	37	28	19	960	310	1730	1598	608	27	2.5	54	430	109	1271	1.9	-	9274	-		9274
1987	1784	-	576	49	27	<1	966	222	1239	1385	564	18	2	47	302	56	922	1.2	-	8160	2788		10948
1988	1311	-	243	36	32	4	893	396	1874	1076	419	18	2	40	395	114	882	0.9	-	7736	3248		10984
1989	1139	-	364	52	14	<1	337	278	1079	905	359	7	2	29	296	142	895	1.7	-	5900	2277		8177
1990	911	13	315	60	15	<1	274	426	586	930	315	10	2	33	338	94	624	2.4	-	4948	1890	180-350	6838
1991	711	3.3	95	70	13	4	472	505	404	876	215	15	1	38	200	55	462	0.8	-	4140	1682	25-100	5822
1992	522	10	23	77	20	5	237	635	630	867	166	16	1.3	49	186	91	600	0.7	-	4136	1962	25-100	6098
1993	373	9	21	70	16	-	-	656	543	923	140	14	1.8	56	270	83	547	0.6	-	3723	1644	25-100	5367
1994	355	6	6	49	18	-	-	448	817	996	138	15	2.7	44	319	91	649	0	-	3954	1276	25-100	5230
1995 (10)	270	-	5	48	9	-	68	439	712	839	129	9	0.4	37	311	83	457	0	-	3416	1050	n/a	4466
Means																							
1990-1994	574	8	92	65	16	5	328	534	596	918	195	14	2	44	263	83	576	1	-	4180	1691	-	5871
1985-1994	980	-	274	55	21	8	625	409	1050	1112	358	15	2	44	310	93	777	1	-	6008	-	-	7638

1. Includes estimates of some local sales, and, prior to 1984, by-catch.
2. Includes catches made in the West Greenland area by Norway, Faroes, Denm
3. Until 1994, includes only those catches sold through dealers.
4. Catch on River Foyle allocated 50% Ireland and 50% N. Ireland.
5. Before 1966, sea trout and sea charr included (5% of total).
6. Weights estimated from 1994 mean weight. Early years may be underestimates.
7. Not including angling catch (mainly 1SW).
8. Includes catches in Norwegian Sea by vessels from Denmark, Sweden, Germany, Norway and Finland.
9. Estimates refer to season ending in given year.
10. Includes provisional and incomplete data

Table 4.2.1 Pre-fishery abundance, thermal habitat derived from sea surface temperature data for February, and logged spawners; predicted pre-fishery abundance of non-maturing 1SW North American salmon from H2 and SNLQ spawner model; and residuals (difference between predicted and observed values) from 1978–1996.

Year	Prefishery abundance midpoint	Thermal habitat for February	Lagged spawners	Prefishery abundance from H2 & SNLQ spawners	
				Predicted	Residual
1978	312202	1951	43284	452312	-140110
1979	696631	2058	51166	598639	97992
1980	602723	1823	53198	537571	65152
1981	589035	1912	55314	599527	-10492
1982	491090	1703	54354	507980	-16890
1983	268266	1416	48110	315973	-47707
1984	280453	1257	46603	235863	44590
1985	460860	1410	45202	274574	186286
1986	493787	1688	46360	394755	99032
1987	454006	1627	45536	360720	93286
1988	354961	1698	47060	407930	-52969
1989	284988	1642	50634	434962	-149974
1990	249462	1503	47601	341854	-92392
1991	292418	1357	41742	208075	84343
1992	181756	1381	40228	196728	-14972
1993	139902	1252	45268	216020	-76118
1994	141120	1329	42681	210178	-69058
1995		1310	39431	159294	
1996		1470	36356	178099	
Average 1988-94	234944			267970	-53029

Table 4.2.2 Probability that the forecast of 1996 pre-fishery abundance of non-maturing 1SW North American salmon is less than a particular level, from H2-SNLQ regression model and probability levels between 25–75%.

Cumulative Density Function %	Forecast
25	119,000
30	136,000
35	149,000
40	163,000
45	175,000
50	190,000
55	202,000
60	217,000
65	229,000
70	244,000
75	259,000

Table 4.2.3 Quota options (in tonnes) for 1996 at West Greenland based on H2-SNLQ regression forecasts of fishery abundance. Proportion at West Greenland refers to the fraction of harvestable surplus allocated to the West Greenland fishery. The probability level refers to the pre-fishery abundance levels derived from the probability density function.

Prob.	Proportion at West Greenland (Fna)										
level	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
25	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	1	1	1	1	2	2	2	2
60	0	7	15	22	30	37	45	52	59	67	74
65	0	13	26	40	53	66	79	92	105	119	132
70	0	20	41	61	81	102	122	142	163	183	203
75	0	28	55	83	110	138	165	193	220	248	275

Sp. res =	201,483
Prop NA =	0.59224
WT1SWNA =	2.42
WT1SWE =	2.62
ACF =	1.133

Figure 1.1.1 Nominal catches of salmon in four North Atlantic regions.

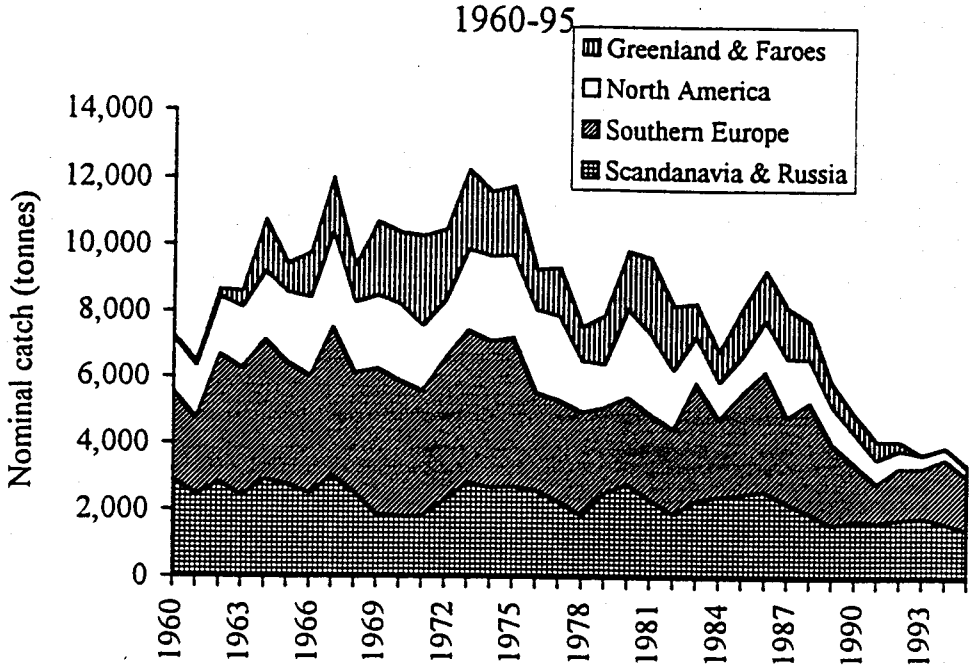


Figure 1.1.2 Production of farmed salmon (tonnes round fresh weight) in the North Atlantic, 1980–1995.

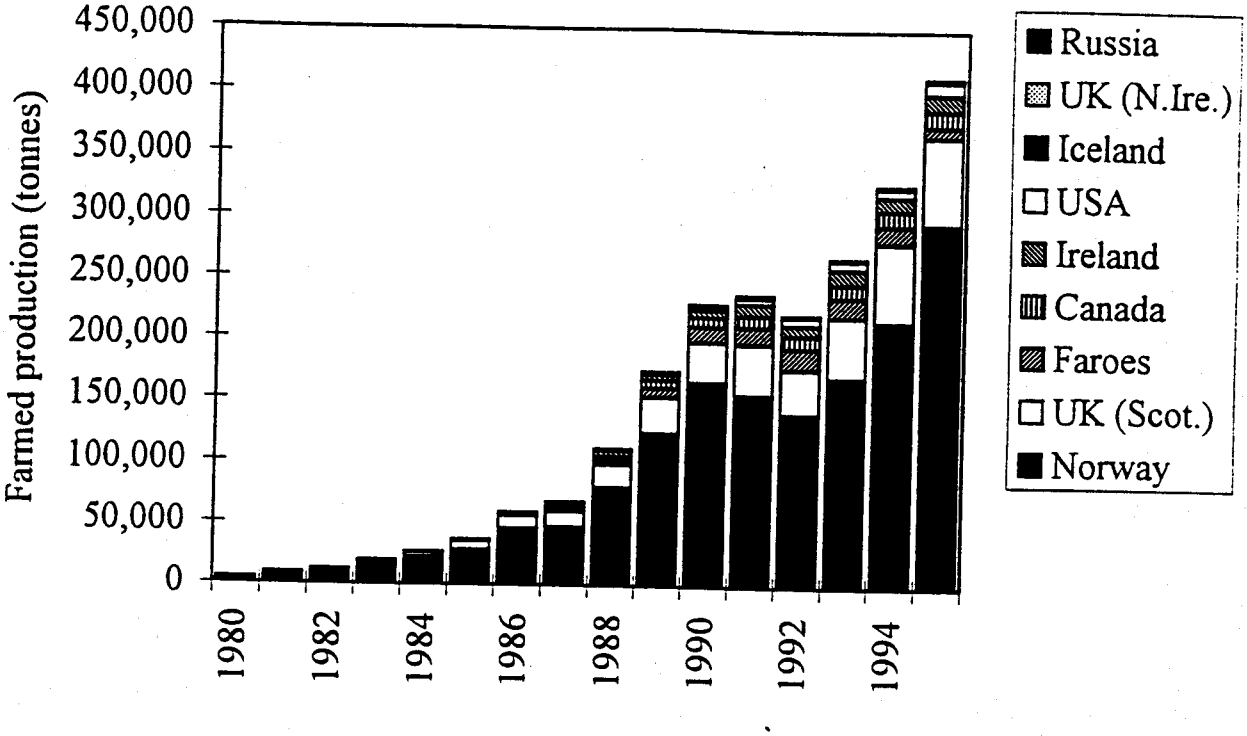


Figure 1.2.1 Catch per 1000 hooks (CPUE) in the Faroese fishery inside the EEZ since the 1982/1983 fishing season. The catch is broken into wild and farmed fish.

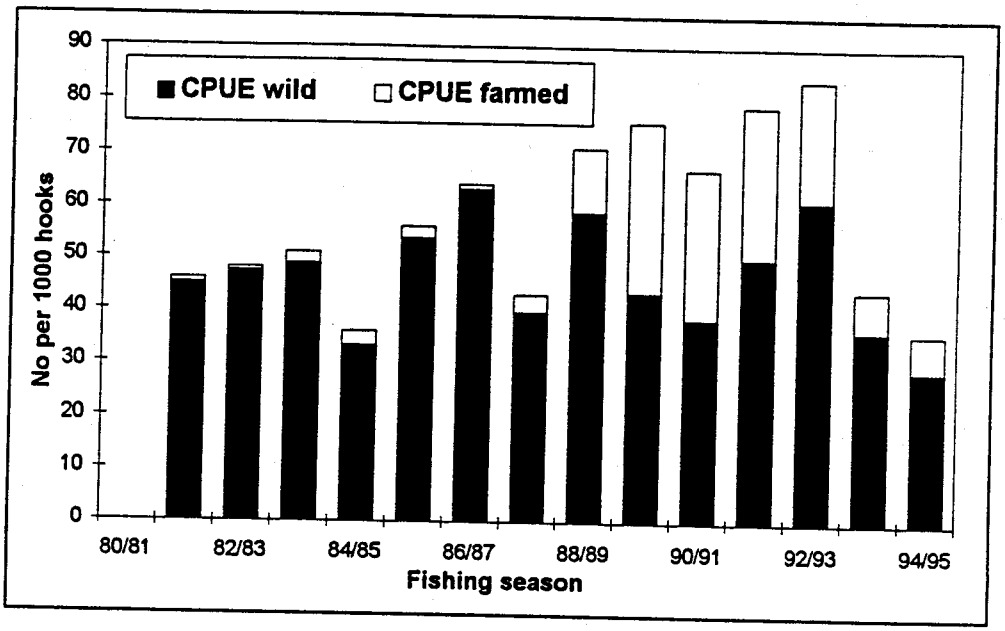


Figure 1.2.2 Post-smolt catches in surface trawl hauls during three research cruises in 1995. Stars show position of trawl stations without smolt catches while numbers indicate position and numbers of smolts caught. Stations south of 62°N were sampled in June. Stations north of that latitude were sampled in July. (From: Holm *et al.*, 1996).

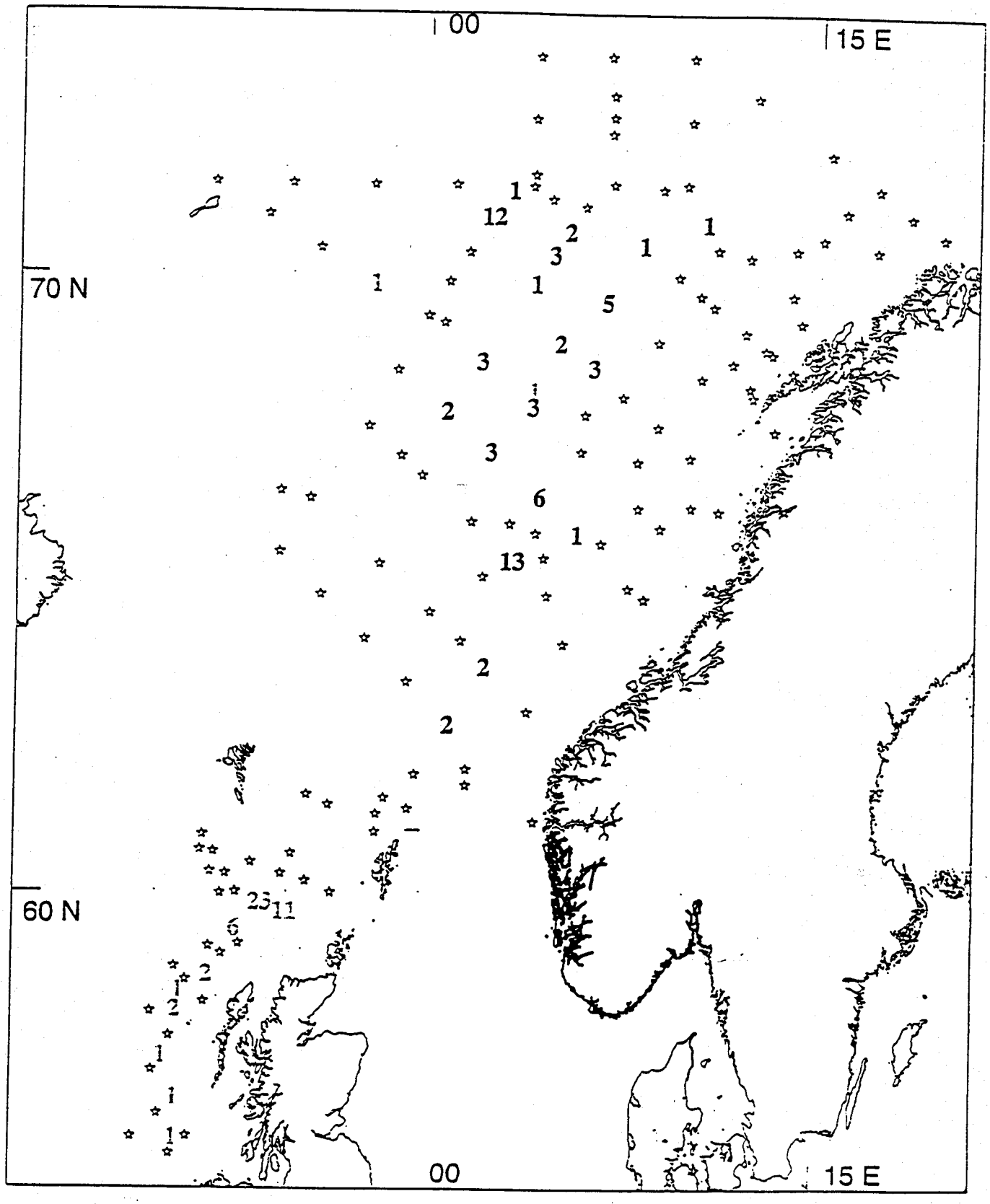


Figure 1.3.1 Pre-fishery abundance of maturing and non-maturing salmon in North America. (A) Total abundance and (B) proportion of the smolt class maturing after 1SW.

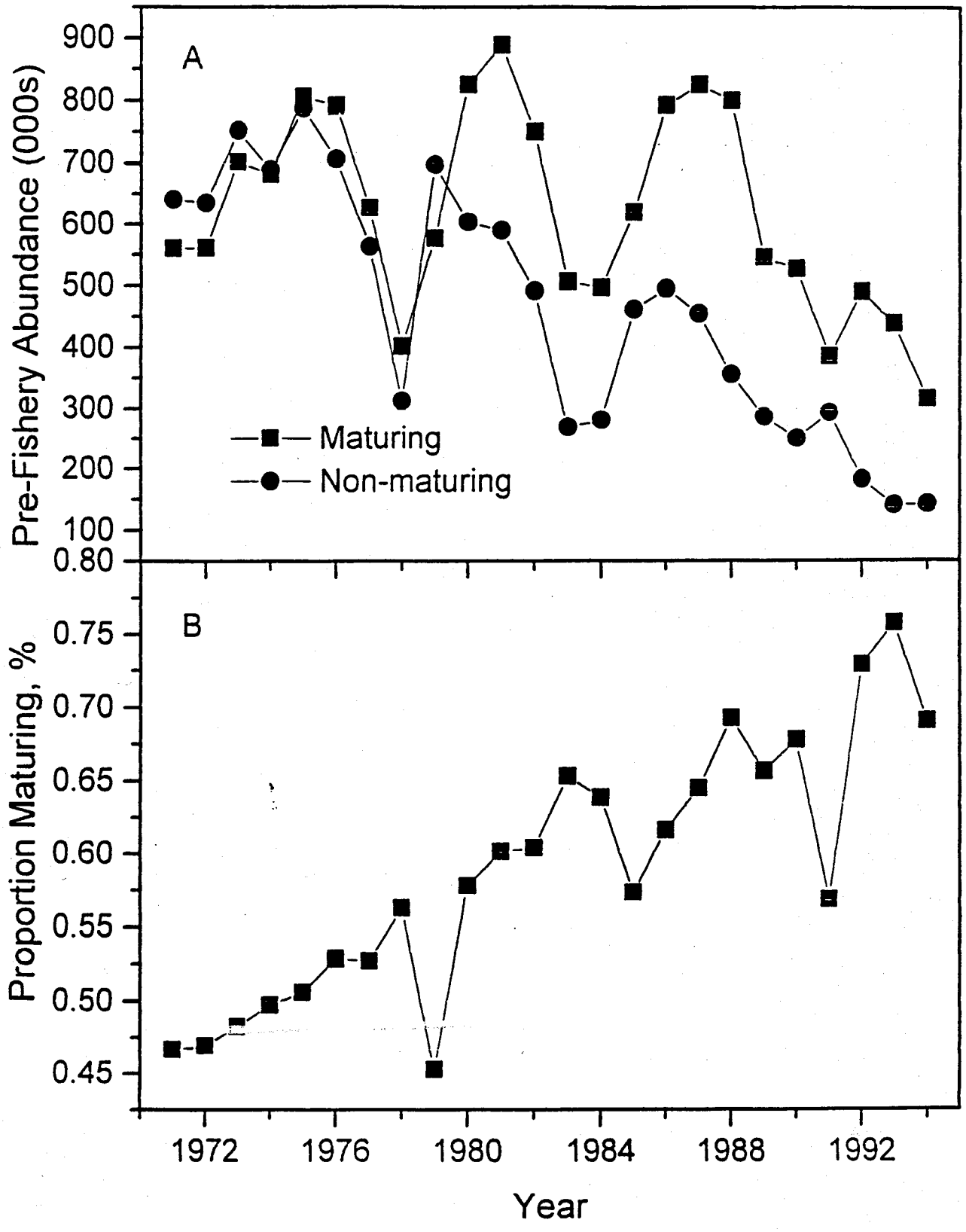


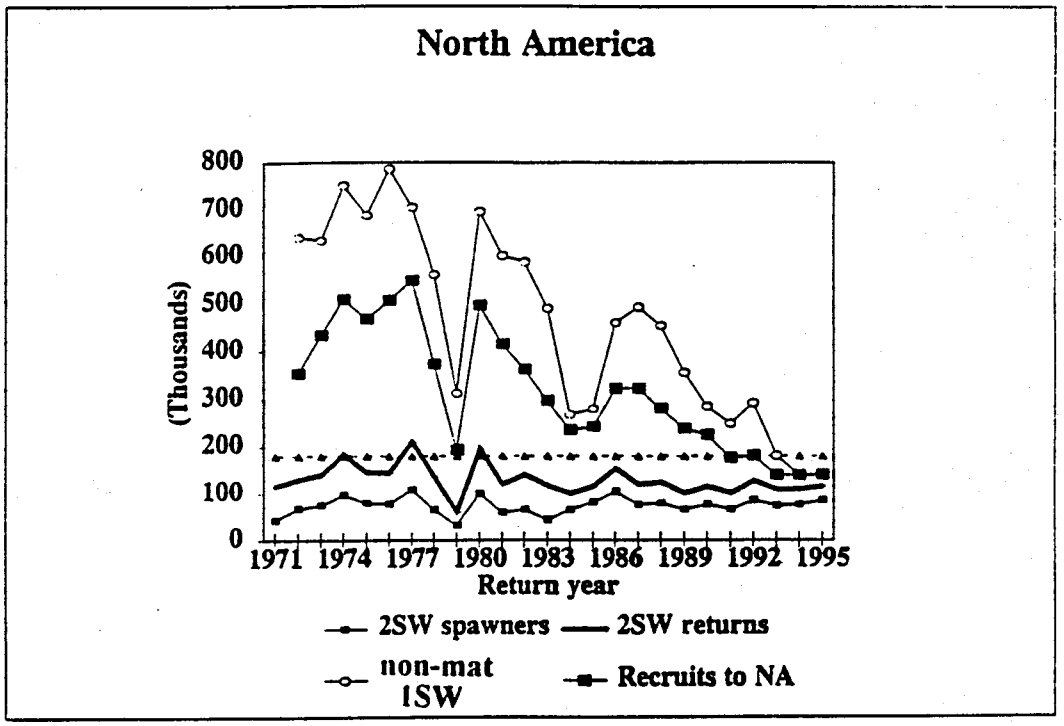
Figure 1.3.2 North American stocks of Atlantic salmon.

Top panel: 2SW fish (non-mature at 1SW), for 1971–1995 return year

a) pre-fishery abundance after 1sea winter: open circles,
b) number returning to coastal waters after 2 sea winters (after ocean fishery): large filled squares,
c) number entering river after 2 sea winters (after coastal fishery): solid line,
d) number spawning after 2 sea winters (after in-river fishery): small filled squares,
e) spawning escapement target: dashed line.

Bottom panel: 1SW fish (mature at 1SW), for 1971–1995 return year

a) pre-fishery abundance after 1 sea winter: filled triangles,
b) number entering river after 1 sea winter (no ocean fishery, after coastal fishery): solid line,
c) number spawning after 1 sea winter (after in-river fishery): small filled squares.



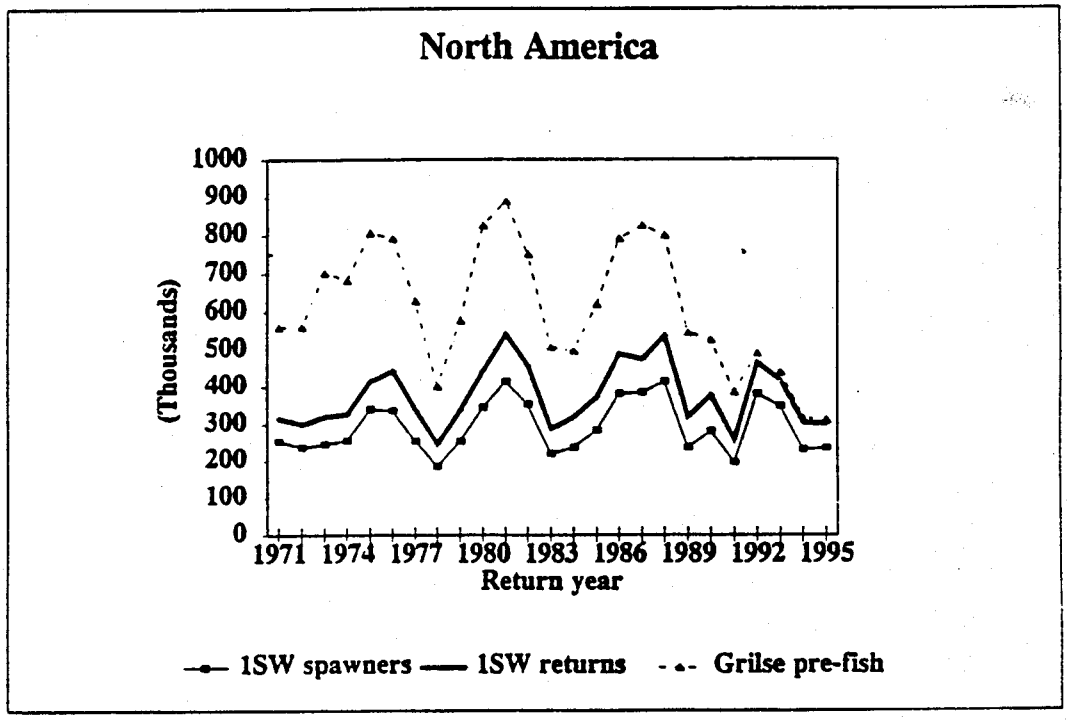


Figure 1.3.3 Proportion of egg deposition target attained in the rivers assessed in four geographic areas of eastern Canada, 1984 to 1995. The vertical line represents the range, the rectangle represents the interquartile range and the horizontal line is the median. The number above the range line indicates the number of rivers assessed in each year.

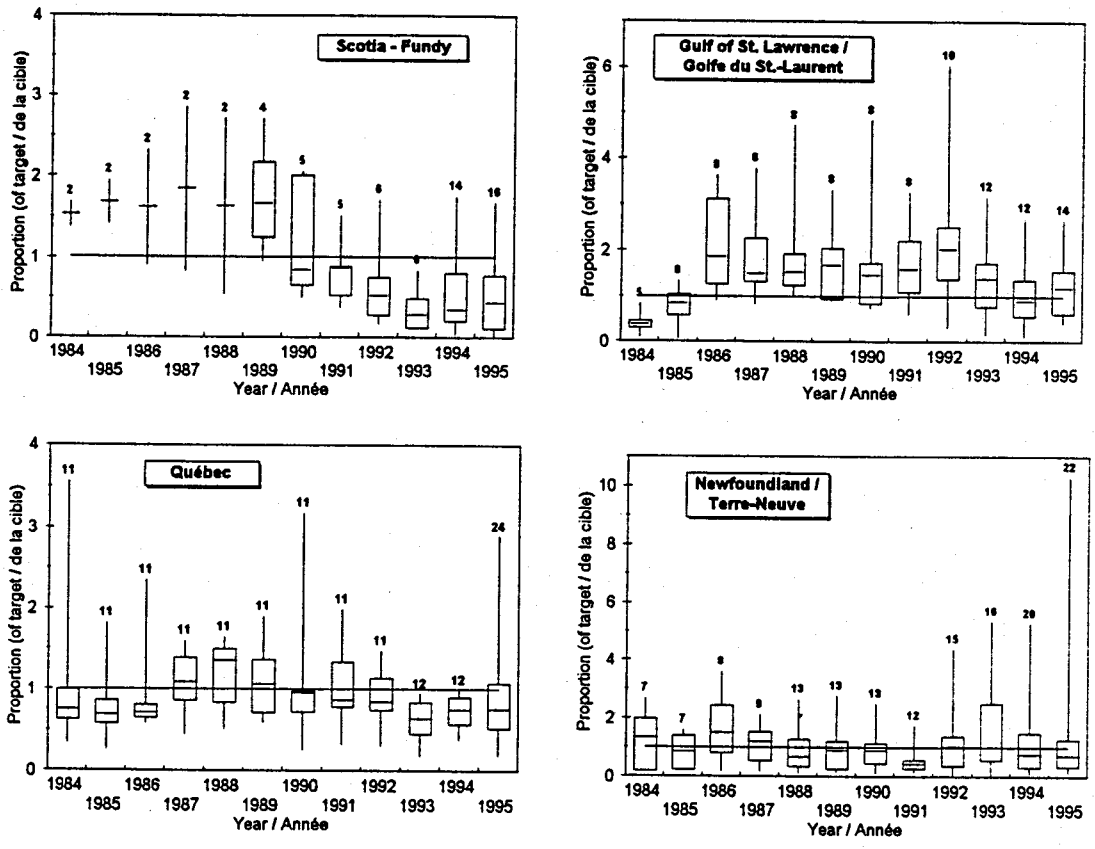


Figure 4.2.1 Observed (1979–1994) and predicted (1978–1996) pre-fishery abundance of non-maturing 1SW North American salmon.

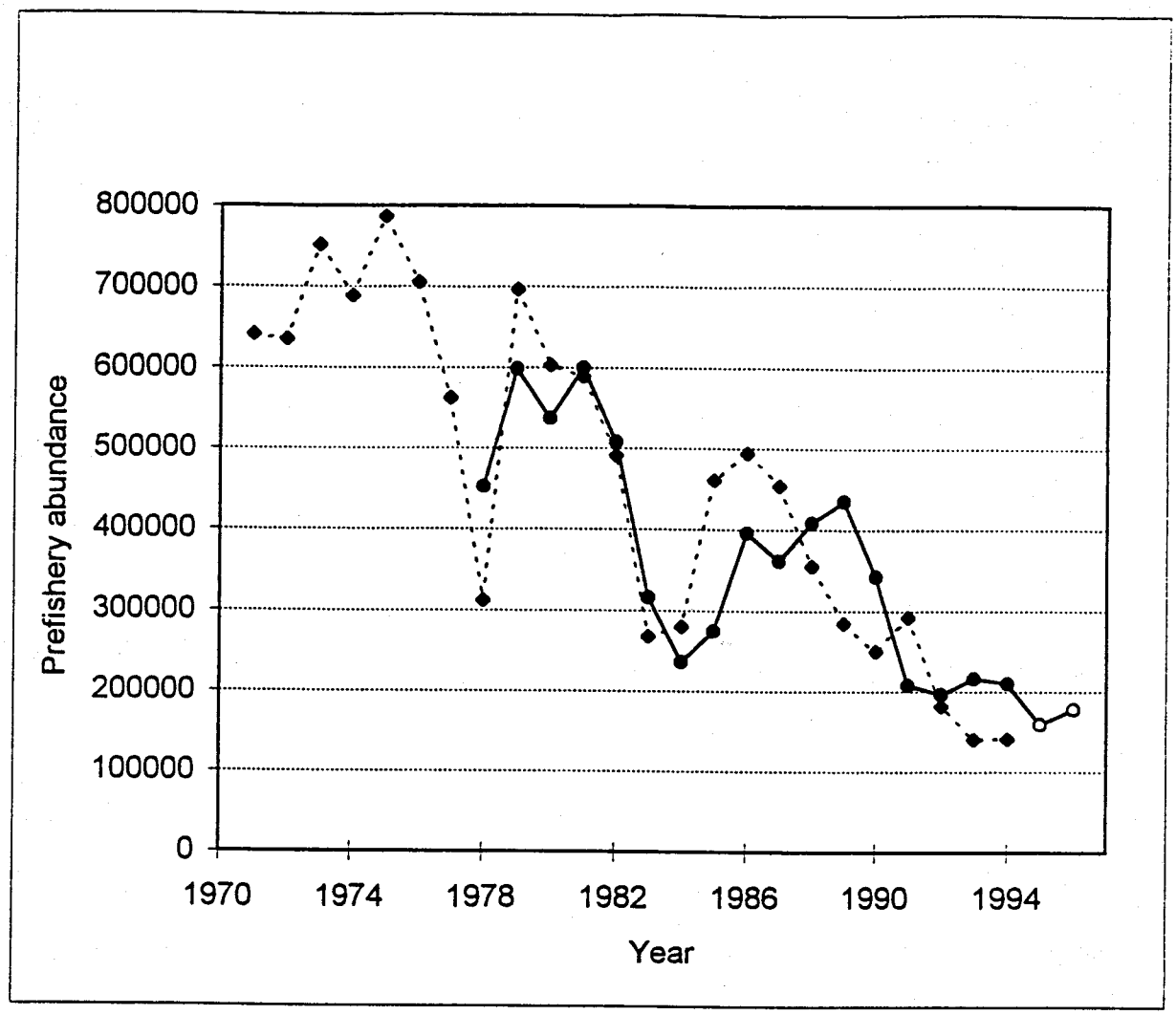


Figure 5.2.1 Maximum and minimum estimates of recruitment of maturing 1SW salmon in southern European countries.

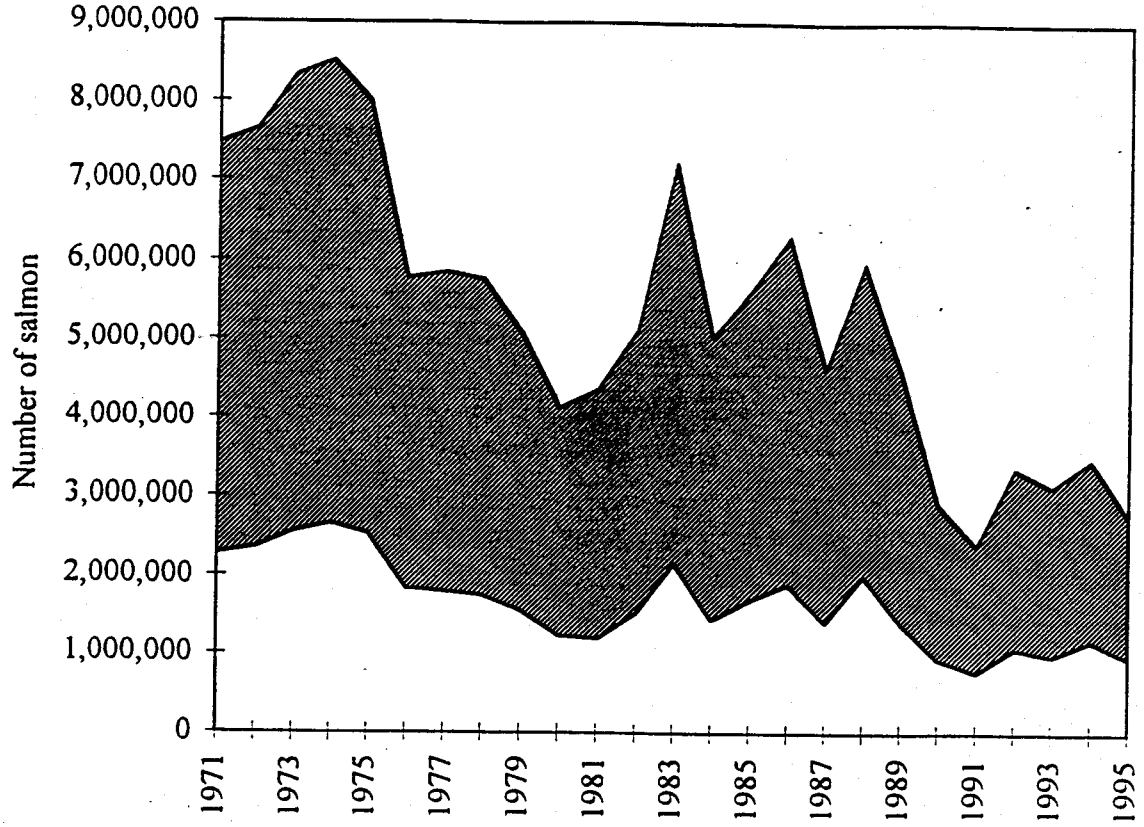


Figure 5.2.2 Maximum and minimum estimates of recruitment of non-maturing 1SW salmon in southern European countries.

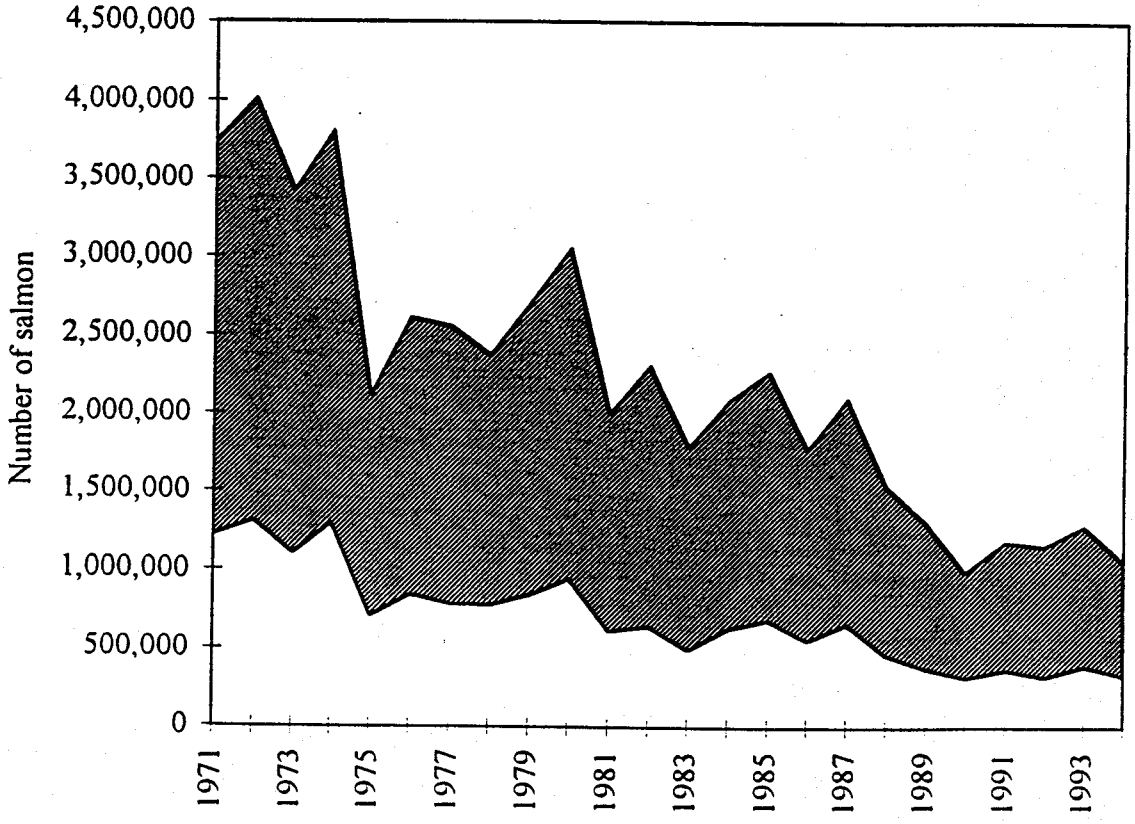


Figure 5.2.3 Maximum and minimum estimates of recruitment of maturing 1SW salmon in northern European countries.

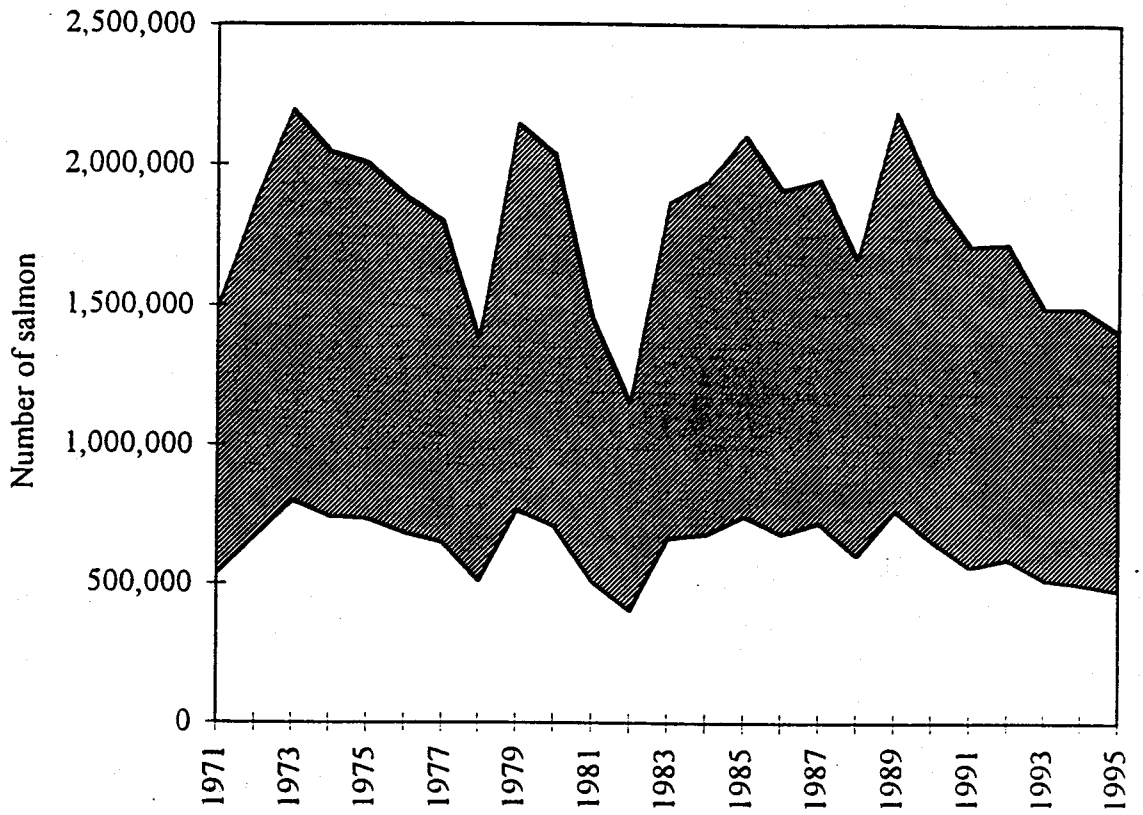


Figure 5.2.4 Maximum and minimum estimates of recruitment of non-maturing 1SW salmon in northern European countries.

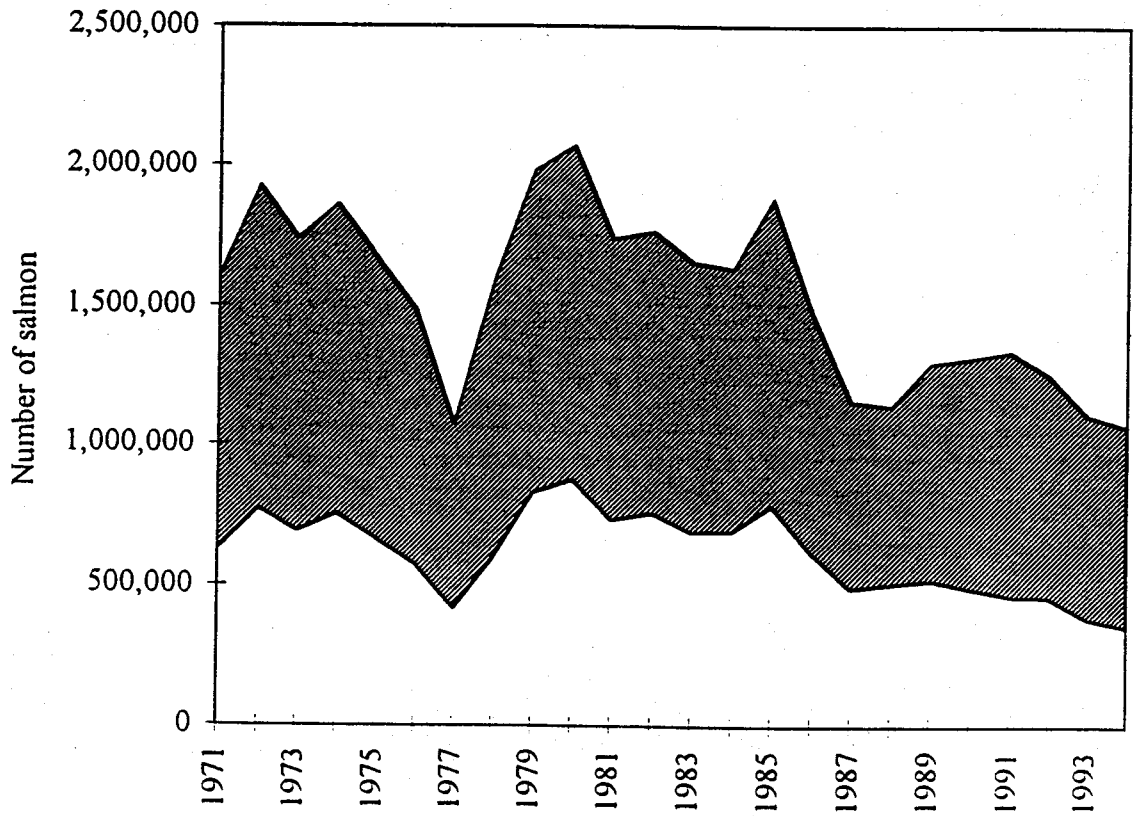


Figure 5.2.5 Time series trends of thermal habitat area and the abundance of non-maturing stock from southern Europe.

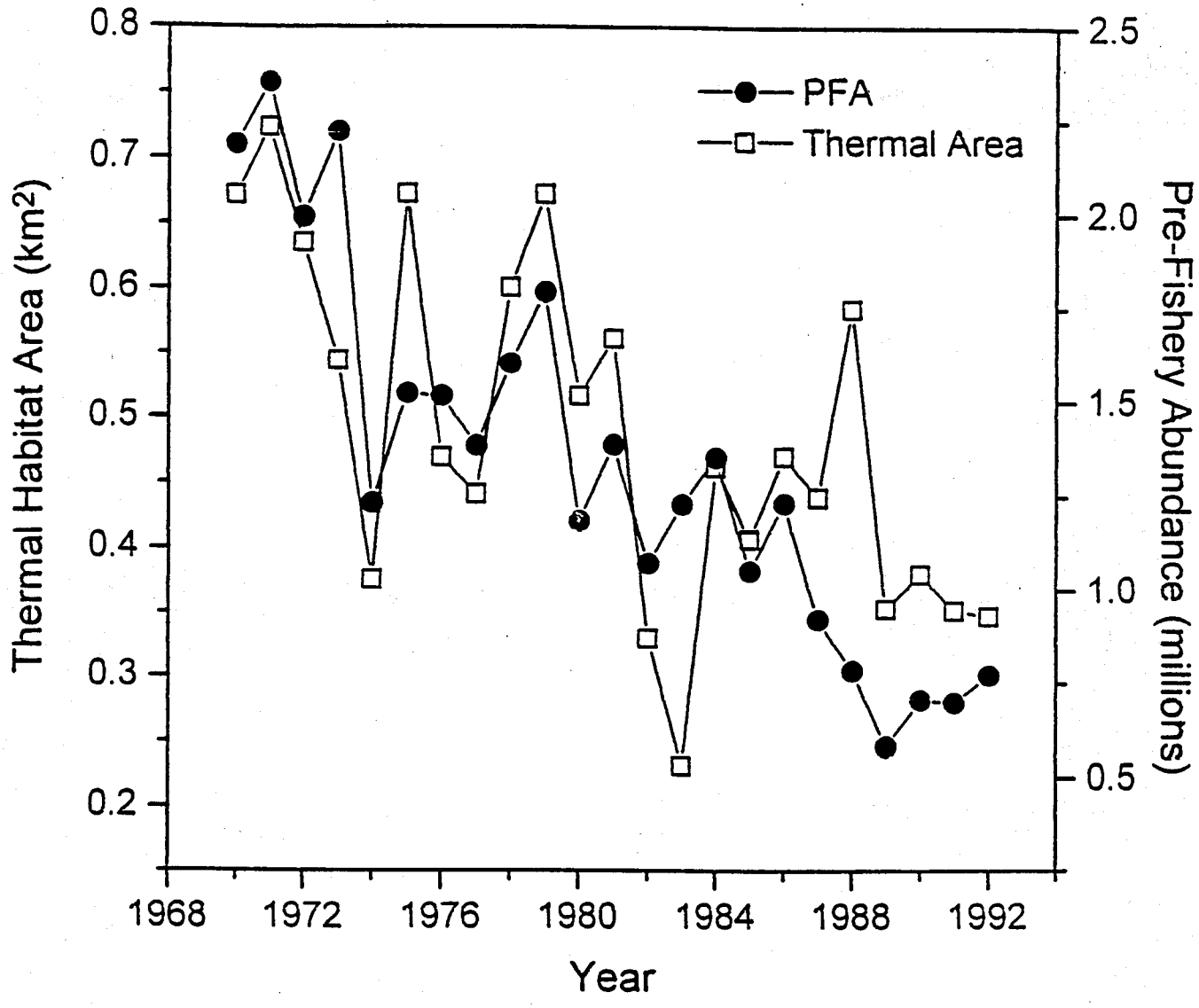
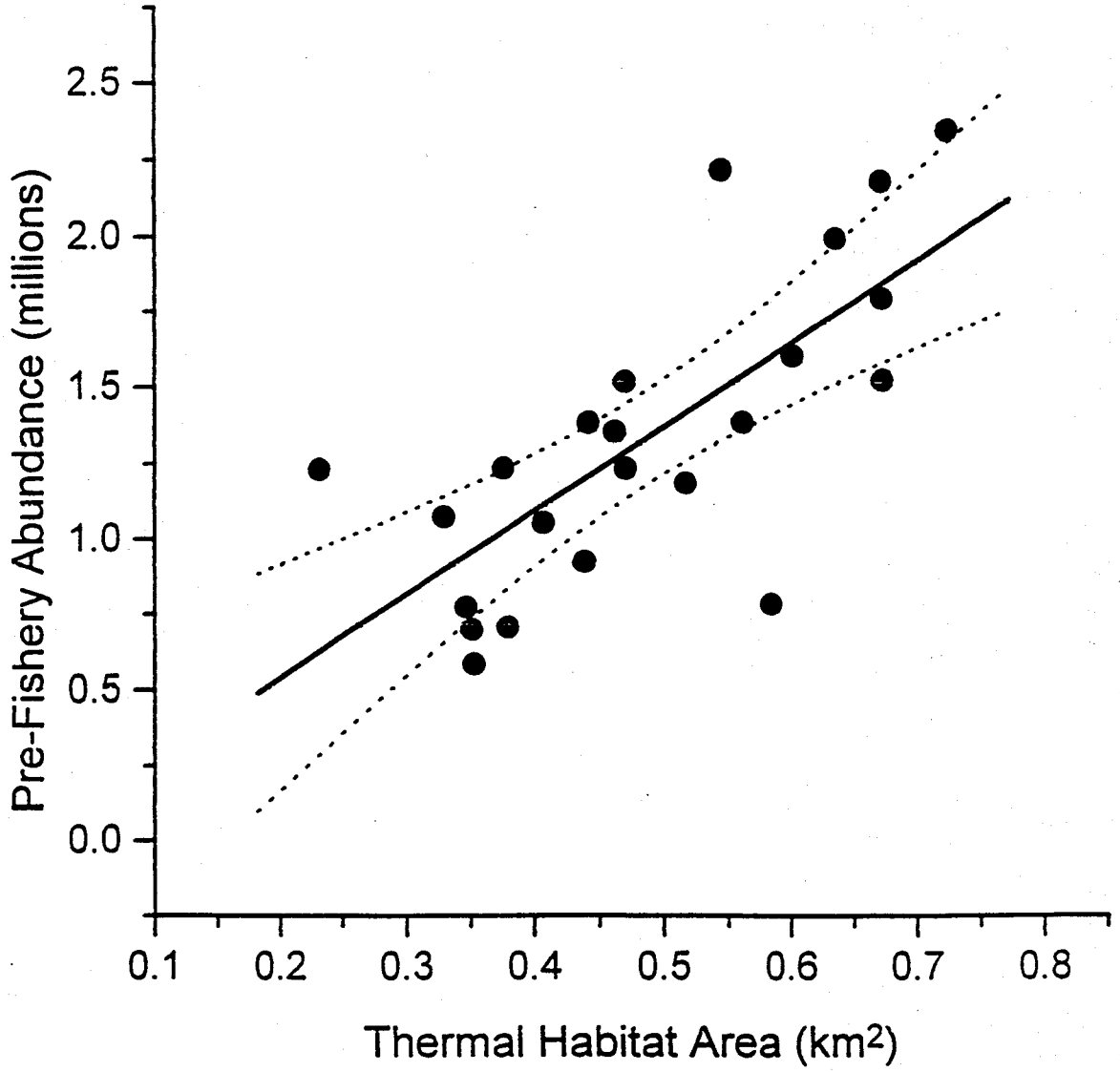


Figure 5.2.6 Relationship between thermal habitat area and the abundance of non-maturing stock from southern Europe.



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