

SAG(06)7

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

***Hotel Riekonlinna, Saariselkä, Finland
Sunday 4 June 2006***

1. Opening of the Meeting

1.1 The Assistant Secretary opened the meeting and welcomed members of the Scientific Advisory Group (SAG) to Saariselkä. He advised the group that Dr Malcolm Beveridge (European Union) had taken up a new posting and was unable to continue as Chairman of the SAG and there would, therefore, need to be an election to appoint a new Chairman.

1.2 A list of participants is contained in Annex 1.

2. Election of Chairman

2.1 The SAG unanimously elected Dr Lars Petter Hansen (Norway) as Chairman.

3. Adoption of the Agenda

3.1 The SAG adopted its agenda, SAG(06)6 (Annex 2).

4. Review of the updated inventory of research and recommendations for enhanced coordination of research

4.1 The Assistant Secretary provided an overview of the updated inventory of research relating to salmon mortality in the sea, ICR(06)2, which is considered by the Board to be an essential tool in identifying research gaps and priorities and in improving coordination of existing research. For 2006, 50 ongoing projects had been included in the inventory and the annual expenditure on these projects was approximately £5.1 million, although no costings had been provided for 4 projects. Where the information had been provided by the Parties, details of collaboration between public and private organizations, and a breakdown of the funding of these projects, had been included in the inventory. Since the last update, 9 new projects had been included in the inventory and 9 projects had been completed. In addition, two US projects formerly contained in the inventory had been removed completely because the US had advised that they were not relevant to marine mortality of salmon.

4.2 As agreed by the Board at its last meeting, projects that had not been updated had been removed from the list of ongoing projects following consultation between the Secretariat and the Board Member concerned.

4.3 As requested by the Board, the Secretariat had requested details of the sampling programme at St Pierre and Miquelon from the French authorities for inclusion in the inventory but no response had been received to date.

- 4.4 At its last meeting, the Board had asked that the Secretariat allocate ongoing projects to the Work Package and Task in the SALSEA programme to which they relate, so that those areas of the programme which are already being addressed, at least in part, through ongoing research, and gaps in the SALSEA programme, could be identified. The information is presented in Table 3 of the updated inventory. New projects of relevance to the SALSEA programme include genetic studies in Ireland and Norway which will contribute to the development of a baseline or genetic atlas of stocks to facilitate genetic stock identification of salmon caught in research cruises at sea, if these cruises can be funded. Two projects of particular relevance to the offshore element of the SALSEA programme had been completed in 2005. The first project involved collaborative trials of trawl gear conducted by Scotland and Norway. The second involved research cruises for salmon in the Labrador Sea by Canada. The SAG recommends that, in future, Table 3 in the inventory should not provide a comparison of expenditure on ongoing projects with that envisaged under the SALSEA programme because the values provided are not directly comparable and goals of the research may differ.
- 4.5 The SAG noted that research vessel fleets were being rationalized in several countries with the expectation of replacing older vessels with fewer, but larger, vessels. Given existing commitments of the remaining vessels, obtaining research vessel time for salmon work may be more difficult in future.
- 4.6 The SAG noted that there is only one ongoing study concerned with the development of methods. However, the Group was advised that Cefas (UK) has recently developed a new large-memory (8 Mbit) data storage tag that is small enough to be used on the largest smolts (1g in water). This development was not specifically related to tagging salmon and had not, therefore, been included in the inventory.
- 4.7 The SAG was also advised of a project involving the deliberate release of externally tagged farmed salmon involving collaboration between Scotland and Norway intended to improve understanding of the migration and fate of escaped farmed salmon. The Group believed that details of this project should be included in the inventory. The Group recognized that there was a number of activities being conducted which collect data of interest to Atlantic salmon marine dynamics, but which are not documented in the inventory. The absence of these projects relates to the focus of these studies which are not directly related to salmon and it would be difficult to capture all the activities and their costs. Knowledge of these projects would be important to the implementation team of SALSEA but are beyond the capacity of IASRB to document completely.
- 4.8 The Group noted that the inventory is made available on the Board's website and to the ICES Working Group on North Atlantic Salmon to assist it in identifying data deficiencies, monitoring needs and research requirements. However, the group agreed that efforts should be made to better communicate the valuable information in the inventory to researchers and to NASCO's accredited NGOs. The Group believed that it would be valuable to consult the Chairman of the NGOs to seek feedback from the NGO group on whether or not they found the inventory useful. The Group also agreed that a brief overview of the inventory should be presented to the Board at its meetings.

The SAG recommends that the Board Members make efforts to distribute the inventory to scientists involved with research on salmon at sea in their countries.

- 4.9 The SAG noted that for some Parties long-term monitoring programmes of smolt survival in a number of rivers are collated and presented as a single project in the inventory while other Parties present projects on individual rivers separately. The Group agreed that each Party or jurisdiction should be requested to present such studies as a single project for inclusion in the inventory when it is next updated.
- 4.10 The Group agreed that it is useful to include information on both ongoing projects and completed projects in the inventory.
- 4.11 The SAG recommends that the Parties be given an opportunity to provide any additional information to the Secretariat by 30 June for inclusion in the inventory, and that, thereafter, the inventory should be made available on the Board's website.

5. The SALSEA Programme

(a) Progress Report

- 5.1 At its 2005 meeting, the Board had fully endorsed the SALSEA programme and had noted that its implementation would require funds of approximately £7.8 million to £10.5 million, depending on whether there are two or three years of research cruises. The Board had agreed to arrange for a peer review of the SALSEA programme and the Chairman was asked to write to Drs Helle (US) and Beamish (Canada), both of whom have extensive experience of research on Pacific salmon, inviting them to review the SALSEA programme.
- 5.2 The Assistant Secretary referred to document ICR(06)3 which indicated that a response had been received from Dr Beamish but not, to date, from Dr Helle. Dr Beamish had indicated his support for the marine survey, particularly when combined with genetic stock identification and a comprehensive disease assessment programme. He had suggested that while there are numerous sources of mortality he believed there had to be a fundamental mechanism regulating carrying capacity. He had also suggested that there might be benefits from the establishment of a small international team of people studying the basic mechanisms regulating salmon populations. The SAG welcomed this support for the SALSEA programme, but noted, however, that in the Pacific Ocean salmon are the dominant pelagic fish species. This is not the case in the North Atlantic Ocean and there have been enormous increases in the biomass of pelagic species such as herring and blue whiting in recent years. The SAG considered that any changes in ocean carrying capacity in the North Atlantic may not be related to intra-specific competition and agreed that it would be valuable if ICES was requested to provide information on trophic dynamics of salmon and their implications for mortality of salmon at sea.
- 5.3 The SAG noted that the Board is being asked to consider supporting a joint symposium with the North Pacific Anadromous Fish Commission in 2008 or 2009 to allow for a further exchange of information between researchers in the North Pacific and North Atlantic Oceans on issues concerning marine mortality of salmon. The SAG supported this proposal and noted that there was also support in ICES for a symposium on this topic.

- 5.4 The Board had also asked that the SALSEA programme be communicated to ICES to raise awareness of the programme and to seek support for, and feedback on, the programme from ICES' community of marine scientists in relation to SALSEA's relevance to the ecosystem approach. Dr Niall O'Maoileidigh (EU) had agreed to make appropriate arrangements in ICES and reported to the SAG that he had presented information on the SALSEA programme to the Consultative Committee of ICES on two occasions and the item remains on that Committee's agenda. This Committee includes representatives of the ICES advisory and science committees. He had provided the background to the establishment of the International Atlantic Salmon Research Board and the development of the SALSEA programme, an overview of NASCO's work under the Precautionary Approach and the Board's efforts to implement a fund-raising initiative. The Consultative Committee had indicated its support for the SALSEA programme and had suggested that ICES would be willing to serve as a coordinator for the SALSEA programme if that would be of interest to the Board. The SAG believed that it could be valuable for ICES to assist the Board by identifying possible opportunities for salmon research to be incorporated into existing research vessel cruises and in providing oceanographic information of relevance to the SALSEA programme.
- 5.5 It was noted that the SALSEA programme is a comprehensive mix of freshwater, estuarine, coastal and offshore elements but that the Board's initial priority is studies of the migration and distribution of salmon at sea. The SAG discussed the nature of the information on mortality of salmon at sea that would be derived from the inshore and offshore elements of the SALSEA programme. It was recognized that telemetry studies in coastal waters could provide quantitative estimates of mortality and that such studies might be progressively extended offshore. In contrast, the information derived from offshore research would be qualitative in nature but improved understanding of the distribution of salmon at sea should facilitate identification of the factors influencing them.
- 5.6 The SAG noted that there had been discussions between the Secretary and President of NASCO and the Research Directorate General of the European Commission in relation to possible funding under the EU Seventh Framework Programme. The SAG recognized that there may need to be considerable work in developing a proposal to ensure that elements in the SALSEA programme are framed around one of the Seventh Framework Programme themes (e.g. climate change). However, the SAG was advised of an initiative to include the SALSEA programme as a separate theme under the EU programme.

(b) Recommendations to the Board

- 5.7 In adopting the SALSEA programme, the Board had agreed that research priorities and timescales for the use of the Board's existing funds that are available for research should be identified and the research initiated at the earliest opportunity. This would demonstrate to the Parties and to potential fund-raisers further progress in implementing the SALSEA programme. In 2005 the Board had noted that several research coordination Workshops had been identified that would support the SALSEA programme. The Chairman introduced document SAG(06)2 which indicated that in

accordance with the Board's decisions at its 2005 meeting, the SAG had been requested to liaise with the SAG members to develop recommendations on:

- projects that might be initiated immediately given that the major elements of the SALSEA programme are dependent on substantial funds being raised;
- detailed time-lines and costings for the components of the SALSEA programme based on various funding scenarios.

5.8 The SAG had previously identified two main topics that might be supported from the Board's existing resources, SAG(06)2. These were analysis of tagging data and genetic stock identification. While the SAG was aware of the Board's current financial resources, it did not know the extent of the funds that may be available to support research because the Board's planned expenditure in other areas in the coming year is unknown.

Analysis of tagging data

5.9 The SAG noted that there is a considerable amount of information on tag recoveries in laboratories around the North Atlantic that have not been fully analyzed (e.g. data from West Greenland, Maine, Norwegian Sea and Faroes). While the SAG recognized that the historical tag recovery data had been obtained from fisheries, many of which no longer operate or are greatly reduced, there could be valuable information obtained from an analysis of the information with regard to the spatial and temporal distribution of salmon at sea. The Group discussed if there would be merit in an assessment of the lessons learned from previous tagging studies but noted that the SALSEA programme proposes the use of genetic stock identification methods to identify fish sampled during research cruises. The SAG believes that an analysis of historical tag data could be highly informative and could assist in planning research cruise efforts. The SAG noted that the ACFM report to NASCO, CNL(06)7, contains a recommendation that "a Workshop be organized to assemble and analyse historical tagging information to investigate trends in migration and marine distribution of salmon at sea". The SAG supported this recommendation and suggests that if ICES organized such a Workshop the Board may wish to propose to ICES that it would be willing to support the participation at the Workshop of a small number of additional experts, particularly oceanographers and experts in GIS (Geographic Information Systems). It was suggested that participation in the Workshop by salmon biologists might be facilitated if it was held in conjunction with a meeting of the Working Group on North Atlantic Salmon. Others had concerns about extending the Working Group meeting. The SAG felt that funding of up to £5,000 by the Board might be appropriate.

Genetic stock identification

5.10 There is now a concerted effort, SALMAN, in relation to genetic stock identification (GSI) of salmon, which aims to collect standardized genetic information on Atlantic salmon from around the species' distribution area. SALMAN is an association of scientists who have agreed to collaborate on salmon genetic issues under the coordination of Eric Verspoor in Scotland and Tim King in the USA. The SAG discussed whether or not it would be valuable to support a workshop with the

objective of planning an inter-laboratory calibration exercise involving laboratories working through the SALMAN initiative. The SAG also discussed whether at that Workshop the SALMAN members might be asked to develop a road map of how genetic stock identification work is developing and how it might be used to support the SALSEA programme. The SAG recognized that it did not have the technical expertise to develop detailed Terms of Reference for a genetic workshop and noted that there had already been some progress at a meeting in Virginia in 2004 in agreeing sixteen loci for use in future genetic studies of salmon. However, the report of this meeting had not been seen by members of the SAG. The SAG felt that it would be useful to have an update on progress and further explanation of how genetic stock identification may be implemented in the SALSEA programme. Rather than proposing a workshop to allow this information to be developed the SAG agreed that the Board should seek proposals from geneticists, through a process of competitive tenders, to develop a comprehensive report on these aspects. The SAG recommends that a sum of £20,000 should be made available to facilitate this process.

Other topics

- 5.11 A third project, identified by the SAG, but of lower priority, would be for the Board to seek updated information on advances in scale reading methodologies and analyses in relation to marine growth and details of relevant data sets. It was suggested that Dr Kevin Friedland (USA) might be approached in this regard. The SAG recommends that the Board should allocate a sum of £10,000 for this project. The SAG also felt that the Board may wish to consider opportunities to enhance collaboration in relation to information obtained from monitored rivers.

Timelines and costings

- 5.12 The Chairman of the Board, Mr Jacque Robichaud, indicated that the SAG had been asked to develop detailed timelines and costings for the components of the SALSEA programme based on various funding scenarios (e.g. if £7.5 million was available in 2007, £4 million available in 2008, etc.). The SAG recognized that it would be important to prioritise the research elements in the SALSEA programme in the event that the Board proceeds with a fund-raising programme. For example, a potential sponsor may wish to know how any contribution to the Board would be spent and it may be possible to extend the period of research so as to reduce the funds required each year. The SAG noted that one possible approach might be to initially prioritise the highest cost projects in the SALSEA programme but noted that a number of projects are inter-dependent. The SAG, therefore, developed a matrix of research priorities within the SALSEA programme (Table 1).
- 5.13 The following costings are based on those provided in the SALSEA programme. It should be borne in mind that the SALSEA programme includes a wide range of marine and freshwater elements, and was designed to allow consideration to be given to funding specific components, either as support to the full implementation of the programme, which is clearly the desired option, or to possible stand-alone elements which could be considered from funding if this became necessary. The IASRB has agreed to give priority to the marine surveys for their funding efforts, and only the components of Workpackages 1 (*Supporting Technologies*) and 3 (*Oceanic Distribution and Migration*) are costed in the SALSEA programme.

“No costs are provided for Work Package 2 (Early Migration) as it is assumed that this work will continue to be carried out by the Parties, but will include a greater level of cooperation and coordination of research in the priority areas previously outlined in this report”.

- 5.14 The first option in Table 1 is the cost presented in the SALSEA programme for full implementation of Work Packages 1 and 3 with a minimum of two years of cruises in all jurisdictions outlined in the SALSEA programme. The total estimated funding required is £7,760,000.
- 5.15 The second cost option assumes that only one year of cruises in all jurisdictions can be funded and that all of the supporting technology programmes are also implemented. The cost in this instance is £4,960,000 but will lack the advantage of having the second year of cruises to consolidate the initial survey findings.
- 5.16 Option 3 is the minimum cost considered to allow at least three cruises of the fifteen cruises outlined in the SALSEA programme over one year and full implementation of the preparatory programme (3.2 and 3.1). However, there will be limited development of trawl techniques (1.2) and the costs presented here are limited to purchase or adaptation of existing trawls for these cruises. The costs of analysis (3.4) are also reduced to account for the lower volume of material to be analysed. Elements such as the genetic stock identification baseline (1.1) will need to be funded from other sources as will the analysis of existing scale sets (1.3) to highlight important information in historical marine survival. This option costs £750,000 which is considered the minimum for initiating research cruises.
- 5.17 The remaining options (4 to 7) assume that only limited funding as indicated becomes available and for illustrative purposes funds of £400,000, £200,000, £100,000 and £50,000 are shown with the elements of the SALSEA programme which should be considered for funding. In all instances, the funds are not sufficient to allow a research cruise effort which would provide adequate spatial or temporal coverage to meet the SALSEA objectives. The elements to be considered are therefore restricted to the establishment of the genetic baseline (1.1) and the analyses of scale samples (1.3), either in full or in part, depending on the funding available.
- 5.18 If funding greater than £750,000 but less than £5 million is secured, decisions would need to be made about the number and distribution of additional research vessel cruises to be undertaken and the relative level of investment in other parts of the SALSEA programme, including genetic analysis and scale studies.
- 5.19 With regard to the establishment of the international genetic baseline (1.1) it should be noted that a considerable investment has been put in place since the SALSEA programme was developed and that the costs illustrated in this example required for this element are, therefore, overstated.

6. Other business

- 6.1 There was no other business.

7. Report of the meeting

7.1 The SAG agreed a report of its meeting.

8. Date and place of next meeting

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

8.2 The Chairman closed the meeting and thanked the members of the group for their contributions.

Table 1 SALSEA components to be considered depending on available funds

SALSEA Workpackage	WP and task	Task title	Priority	Option 1 All cruises over 2 years	Option 2 All cruises over 1 year	Option 3 3 cruises over 1 year	Option 4 Available funds £400,000	Option 5 Available funds £200,000	Option 6 Available funds £100,000	Option 7 Available funds £50,000
Supporting technologies	1.2	Sampling techniques and new technologies	1	£330,000	£330,000	£50,000				
Oceanic distribution and migration	3.2	Standardisation - a common approach	2	£25,000	£25,000	£25,000				
Oceanic distribution and migration	3.1	Distribution mechanisms	2	£25,000	£25,000	£25,000				
Oceanic distribution and migration	3.3	Salmon at sea	2	£5,600,000	£2,800,000	£600,000				
Oceanic distribution and migration	3.4	Distribution and migration	3	£180,000	£180,000	£50,000				
Supporting technologies	1.1	Genetic tagging to determine stock origin	4	£1,500,000	£1,500,000		X in part	X in part	X in part	X in part
Supporting technologies	1.3	Signals from scales	4	£100,000	£100,000		X	X	X in part	X in part
Cost				£7,760,000	£4,960,000	£750,000	£400,000	£200,000	£100,000	£50,000

List of Participants

Canada

Mr Gerald Chaput
Mr David Meerburg

Denmark (in respect of the Faroe Islands and Greenland)

Dr Jan Arge Jacobsen

European Union

Dr Niall O'Maoileidigh
Mr Ted Potter

Norway

Dr Lars Petter Hansen (Chairman)

Chairman of the Board

Mr Jacque Robichaud

Secretariat

Dr Peter Hutchinson

SAG(06)6

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

**Hotel Riekonlinna, Saariselkä, Finland
Sunday, 4 June, 2006**

Agenda

1. Opening of the meeting
2. Election of Chairman
3. Adoption of the agenda
4. Review of the updated inventory of research
5. The SALSEA Programme
 - (a) Progress report
 - (b) Recommendations to the Board
6. Other business
7. Report of the meeting
8. Date and place of next meeting