

SAG(07)4

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

***Harborside Hotel and Marina, Bar Harbor, Maine, USA
Sunday 3 June 2007***

1. Opening of the Meeting

1.1 The Chairman, Dr Lars Petter Hansen (Norway), opened the meeting, welcomed participants to Bar Harbor and thanked the US hosts for the arrangements made for the meeting.

1.2 A list of participants is contained in Annex 1.

2. Adoption of the Agenda

2.1 The SAG adopted its agenda, SAG(07)2 (Annex 2).

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

3.1 The Assistant Secretary provided an overview of the updated inventory of research relating to salmon mortality in the sea, ICR(07)2, which is considered by the Board to be an essential tool in identifying research gaps and priorities, in improving coordination of existing research and in support of promotion of SALSEA. For 2007, 54 ongoing projects had been included in the inventory and the annual expenditure on these projects was approximately £5.0 million. No costings had been provided for 3 projects. Since the last update, 10 new projects had been included in the inventory and 8 projects had been completed, two of which were not previously included in the inventory. New projects of particular relevance to the SALSEA programme include a number of studies which will contribute to developing a genetic baseline of stocks to facilitate genetic stock identification of salmon caught in research cruises at sea and gear trials of a pelagic trawl off the Irish coast in May 2007.

3.2 At its last meeting the Board had noted that for some Parties and jurisdictions, long-term monitoring programmes of smolt survival in a number of rivers had been collated and presented as a single project while other Parties and jurisdictions had presented projects on individual rivers separately. The Board had asked that each Party or jurisdiction present such studies as a single project for inclusion in the inventory and this had been done in the 2007 update.

3.3 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 information had been provided to date.

- 3.4 Last year the SAG had noted that the North East Atlantic Commission's pilot project involving the release of externally tagged farmed salmon, to improve understanding of their migration and fate, had not been included in the inventory. Tagged farmed salmon were released in Norway and Scotland in 2006 and a progress report will be made to the Twenty-Fourth Annual Meeting of the North-East Atlantic Commission. Details of this project had not, however, been submitted for inclusion in the inventory. The Secretariat was asked to liaise with the SAG members in Norway and Scotland with a view to including a report on the project before the inventory is made available on the website.
- 3.5 At its last meeting the SAG had agreed that efforts should be made to better communicate the valuable information in the inventory to researchers and to NASCO's accredited NGOs. The SAG recommends that to facilitate such communication, the inventory should be made more prominent and easily accessible on the Board's website. Furthermore, the Secretariat should be asked to make the summary report and tables available in a separate document from the annexes. SAG members should seek to provide links to the inventory on their institutes' websites.
- 3.6 The SAG recognized the need to continue to find means to improve communications and collaboration between institutions working on related topic areas.
- 3.7 The SAG recognized that acoustic telemetry work can contribute valuable information on the migration and distribution of salmon at sea and that acoustic arrays are being located increasingly further offshore. These studies are relevant in planning the marine surveys in the SALSEA programme and the SAG believes that, in future, such projects should be allocated to SALSEA Workpackage 3.

4. The SALSEA Programme

(a) Progress with implementing SALSEA

- 4.1 The Assistant Secretary summarized the actions agreed by the Board at its last meeting to promote and implement the SALSEA programme. A Steering Committee had been established comprising 5 representatives from the NGOs and 5 representatives from the NASCO Parties. With professional support from Brakeley consultants, the Steering Committee had developed the case for support and a marketing package for SALSEA and the NASCO President and Secretary had sought early buy-in and contributions to the fund. The SAG had been requested to deliver a comprehensive package of cruises to be undertaken in 2008 and 2009 (see 4a(ii)) and the Parties had been requested to ensure access to vessel time is given higher priority in 2008/2009 in support of the SALSEA programme. The Board had also agreed to fund three projects. First, it would support participation by GIS experts and oceanographers in the ICES workshop on development and use of historical salmon tagging information (see 4a(i)). A sum of £5,000 was allocated to this project. Second, it would seek proposals for how genetic stock identification work might be supported by the Board but did not allocate funds for this work. Third, it would, as a lower priority, seek a report on the information in relation to marine mortality of salmon that might be obtained from scales. A sum of £10,000 had been allocated to this project. The Board had also allocated a sum of £28,000 to support a joint symposium with PICES, ICES and NPAFC in 2010 on salmon mortality at sea. He indicated that, allowing for this expenditure, the Board had no surplus funds. While

the cost of funding participation in the tagging workshop was expected to be around £2,500, there may be additional costs incurred in promoting SALSEA.

(i) *Analysis of historical tagging data*

4.2 The SAG Chairman reported on an ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas which had been held in St Johns, Newfoundland during 19-22 February 2007. The Board had agreed to support this workshop by funding the participation of a GIS expert and this had been extremely useful in facilitating the group's work. A sum of £5,000 had been allocated last year by the Board to fund this participation but the anticipated cost is likely to be around £2,500. The Workshop had:

- collated published information on oceanic tag recoveries;
- reviewed tagging and tag recovery data that was reported to it;
- agreed a format for recording tag recovery data and considered examples of frameworks for data analysis; and
- formulated a series of hypotheses that could be tested when GIS data was complete.

4.3 The Workshop had recommended that a further meeting be held in 2007 or 2008 to complete compilation of available data and commence analysis of the distribution of recoveries of tagged salmon at sea. In this regard it was noted that the integration of data from the north-west and north-east Atlantic provides a significant opportunity to advance understanding of the marine distribution and migration of salmon. The Workshop had also recommended that consideration be given to collecting data from areas at times when research vessels cannot operate (through, for example, use of new tagging techniques). The Workshop further recommended that the format for tag recovery information be used to prepare data for analysis at the next workshop, that agencies coordinate their efforts to ensure that datasets are not duplicated and that the follow-up workshop include oceanographers and GIS experts to assist in describing salmon distributions in relation to ocean environment.

4.4 The SAG recognised the desirability of establishing a single repository of tag recovery information that would be available to a wider scientific community, e.g. scientists working on climate change. While this is a longer-term objective, in the interim it would be desirable if all data were held nationally according to the agreed format and a listing of the agencies holding the data compiled. The format is available from ICES and the Workshop participants. The SAG recognized that analysis of historical tag recovery information could improve understanding of salmon distribution and migration at sea and therefore benefit the SALSEA programme. The SAG therefore recommends that:

- the Board should encourage the Parties to compile historical tagging information using the format developed by the Workshop;
- NASCO should request ICES to compile, on an annual basis, tag recovery information and report on the status of analysis of historical tag recovery data;

- in the event that ICES convenes a follow-up workshop, the Board should consider funding the participation of a GIS expert and oceanographer and that the sum of £2,500 (or if resources permit, £5,000) be made available to support such participation.

(ii) *Development of Workpackage 3*

4.5 The Chairman reported on an informal meeting organised by the Board to further develop the plans for the marine survey component of the SALSEA programme (Workpackage 3). The meeting had been held in London during 2 and 3 November 2006 and had addressed a number of questions, including:

- why study salmon in the sea?;
- what do we know about the marine ecology of salmon?;
- what key things don't we know about salmon in the sea?;
- why is a coordinated marine research programme required?;
- what survey techniques will be used?;
- what data will be collected from captured fish and how will they be used?;
- where and when should surveys be conducted?;
- what vessels would be used?;
- what information should be collected from the fish sampled?

4.6 The report of the meeting is contained in document ICR(06) 4. This report had been very useful to the President and Secretary in promoting SALSEA.

(iii) *Development of an application for funding under the EU Seventh Framework Programme*

4.6 The President reported on the development of an application (SALSEA-MERGE) for funding marine research surveys in 2008 and 2009 that had been submitted to the EU under the Seventh Research Framework Programme (FP7). This application, if successful, would fund 50% of ship-time and 75% of the scientific analyses up to a total of Euro 3.5 million with partners in UK, Ireland, Norway, Faroes, France, Iceland, Denmark, Finland and Spain. The programme comprises a series of workpackages, including:

- development of genetic identification methodology;
- marine sample and data acquisition;
- genetic identification of samples;
- biological analysis of samples;
- merging of data sets and analysis.

4.7 While it was recognised that there would be strong competition for funding, even in the event of an unsuccessful application, it was recognised that there had been commitments from some Parties to vessel time in 2008 and 2009 that, together with possible funding from private sources, such as the Total Foundation, would enable some research surveys in the north-east Atlantic to be undertaken in 2008 and 2009, although additional funding would be needed for the genetic analysis of samples collected. Furthermore, it was hoped that funding would be raised in North America to allow complementary surveys to be undertaken in the north-west Atlantic. It was noted that access to research vessel time in

the US and Canada was extremely difficult but the Ocean Foundation had indicated that eco-vessels might be available in support of SALSEA. He indicated that one advantage of the SALSEA and SALSEA-MERGE initiatives being structured into workpackages and tasks was that there was now a wide range of individual research projects that could be conducted according to available resources. He concluded that the challenge was to ensure that funding was in place to allow a comprehensive programme of marine surveys to be undertaken in 2008 and 2009 in both the north-east and north-west Atlantic. In this regard it was noted that there is a need for scientists around the North Atlantic to promote the need for the marine survey element of the SALSEA programme as a priority for research funding.

(iv) Other activities

- 4.9 At its last meeting the Board had decided to invite the SALMAN coordinators to report on progress with the SALMAN initiative and provide proposals for genetic stock identification work that might be supported by the Board. The SAG noted that the applications for EU FP7 funding and the Total Foundation included proposals for further developing the genetic baseline sampling, for assessing the degree of commonality of markers in different databases and for identifying differences in sampling approaches underlying the databases. The SAG therefore recommends that the need for the Board to seek advice from the SALMAN coordinators be reviewed at its next meeting in the light of the outcome of the applications for funding.
- 4.10 At its last meeting the Board had agreed to invite Dr Kevin Friedland to report on information relevant to the marine mortality of salmon that might be derived from scale analysis. A sum of £10,000 had been allocated to this project but it was recognised that this was a lower priority than the analysis of historical tagging information, the proposals for genetic stock identification and the 2010 joint symposium. The SAG recognised that in developing the SALSEA-MERGE application for EU FP7 funding, consideration had been given to the information that that might be derived from archival and contemporary scale material and to the establishment of a digital scale library. The SAG therefore recommends that there is no longer a need to seek further advice on this topic and recommends that if funds permit, the Board considers supporting an enhanced sampling programme at West Greenland (see 4.13).
- 4.11 The SAG noted that progress in planning for the 2010 symposium would be reported during the Special Session on Salmon at Sea to be held during the Twenty-Fourth Annual Meeting of the Council.
- 4.12 The SAG noted that under the SALSEA programme it is recommended that the sampling programme at West Greenland should be extended. The SAG discussed a proposal for research on the trophic feeding state and condition of salmon – continent of origin and age at maturity comparisons. One-sea-winter salmon from both North America and the North-East Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Understanding of the marine ecology of these fish could be advanced through studies of trophic state and condition (i.e. lipid content). The questions that might be addressed include:

- 1) Are trophic states of 1SW non-maturing fish similar between NAC and NEAC origin salmon?
 - 2) Are trophic states of 1SW non-maturing fish different from those of 1SW maturing fish of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?
 - 3) Has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?
 - 4) The same questions would be examined for lipid content to assess fish condition (survivals differ between fish from the two continents. Is this related to condition at that time of year as fish enter their second winter at sea?)
- 4.13 The present sampling program at West Greenland includes the purchase of whole fish specifically for disease sampling. Additional tissue sampling of these fish would be conducted including muscle, liver and caudal fin punches. All tissues would be analysed for lipid and stable isotope ratios. Caudal punches can be collected without lethal sampling and allow sampling of 1SW and 2SW salmon survivors back to home waters. Sampling costs at West Greenland are covered by existing or proposed international collaborative programmes (expenditure in 2006 was £66,200). However, funding is sought from national programs and from the Board for the analysis of the tissue samples. The additional analysis of samples collected in West Greenland will require funding of about £8,000. Details of the proposal and costings are given in Annex 3. The SAG recommends that the Board consider funding the costs of the analysis of tissue samples collected at West Greenland if its existing resources permit, or when new funds become available.
- (b) Progress with promoting SALSEA
- 4.14 The President reported on fund-raising initiatives that had been conducted in conjunction with the Secretariat. A more detailed report will be presented to the Board. In addition to applications for funding to the EU FP7 programme, the Total Foundation (Euro 350,000) and the Ocean Foundation (US\$ 600,000), approaches had been made to a number of organizations and foundations and this had raised awareness not only of SALSEA but of the work of NASCO.

5. Other business

- 5.1 There was no other business.

6. Report of the meeting

- 6.1 The SAG agreed a report of its meeting.

7. Date and place of next meeting

- 7.1 The SAG decided to agree the date and place of its next meeting by correspondence.
- 7.2 The Chairman closed the meeting and thanked the members of the group for their contributions.

List of Participants

Canada

Mr Gerald Chaput
Mr Bud Bird
Ms Chantal Lamadeleine

Denmark (in respect of the Faroe Islands and Greenland)

Dr Jan Arge Jacobsen

European Union

Dr Niall O'Maoileidigh
Mr Ted Potter
Dr Trevor Hastings

Norway

Dr Lars Petter Hansen (Chairman)

USA

Mr Pat Scida
Mr Tim Sheehan

Chairman of the Board

Mr Jacque Robichaud

President of NASCO

Dr Ken Whelan

Secretariat

Dr Peter Hutchinson

SAG(07)2

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

Agenda

1. Opening of the meeting
2. Adoption of the agenda
3. Review of the updated inventory of research
4. The SALSEA Programme
 - (a) Progress with implementing SALSEA
 - (i) Analysis of historical tagging data
 - (ii) Development of Workpackage 3
 - (iii) Development of an application for funding under the EU Seventh Framework Programme
 - (iv) Other activities
 - (b) Progress with promoting SALSEA
 - (c) Recommendations to the Board
5. Other business
6. Report of the meeting
7. Date and place of next meeting

Marine ecology research proposal for 2007

Trophic feeding state and condition of salmon – continent of origin and age at maturity comparisons

One-sea-winter salmon from both North America and the northeast Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Marine ecology of these fish could be advanced through studies of trophic state and condition (i.e. lipid content). The questions to be addressed include:

- 1) are trophic states of 1SW non-maturing fish similar between NAC- and NEAC-origin salmon?
- 2) Are trophic states of 1SW non-maturing fish different from that of 1SW maturing of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?
- 3) Has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?
- 4) The same questions would be examined for lipid content to assess fish condition (survivals differ between fish from the two continents. Is this related to condition at that time of year as fish enter their second winter at sea?)

The present sampling program at West Greenland includes the purchase of whole fish specifically for disease sampling. Additional tissue sampling of these fish would be conducted including muscle, liver and caudal fin punches. All tissues would be analysed for lipid and stable isotope ratios. Caudal punches can be collected without lethal sampling and would allow sampling of 1SW and 2SW salmon survivors back to home waters.

Activity	Cost	Existing funding	New funding	IASRB support
Project costs				
West Greenland	£74,200	£66,200	£8,000	£8,000
Homewater in NAC	£4,200		£4,200	£0
Homewater in NEAC	£4,200		£4,200	£0

Activity	Cost	Existing funding	New funding	IASRB support
West Greenland Research Program				
Sampling at West Greenland (international collaborative program)	£66,200 (Sampling costs, fish purchase, genetic analysis, disease analysis, stomach content analysis)	£66,200	0	0
Collection of additional tissues	£0 (muscle, liver, caudal fin)		0	0
Shipping of samples to North America	£300		£300	£300
Stable isotope analysis of tissues	£6,300 (150 fish X 3 tissues per fish X £14 per tissue)		£6,300	£6,300
Stable isotope analysis of salmon prey	£1,400 (20 species/genus X 5 replicates X £15 per tissue)		£1,400	£1,400
Homewater sampling of survivors to North America (sampling planned from Miramichi River)				
Collection of tissues	£0 (muscle, liver, caudal fin)			
Stable isotope analysis of tissues	£4,200 (100 fish X 3 tissues per fish X £14 per tissue)		£4,200	£0
Homewater sampling of survivors to NEAC (to be developed)				
Collection of tissues	£? (muscle, liver, caudal fin)			
Stable isotope analysis of tissues	£4,200 (100 fish X 3 tissues per fish X £14 per tissue)		£4,200	£0

International Atlantic Salmon Research Board

ICR(07)6

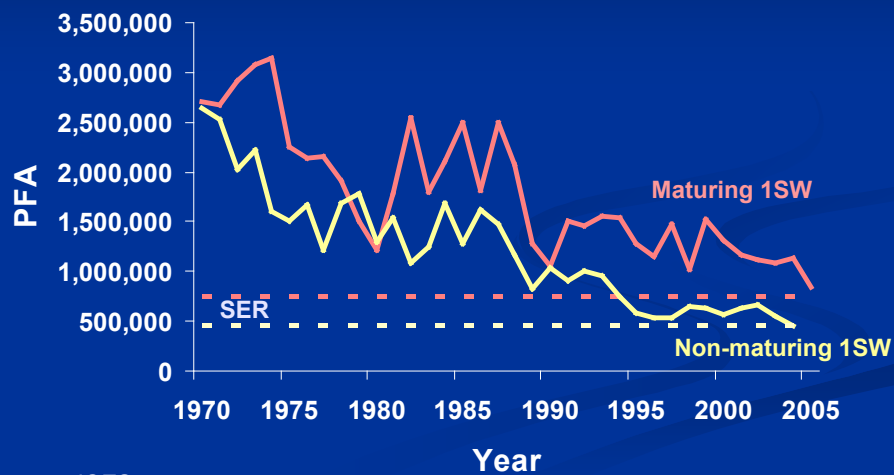
SALSEA Programme – Progress to Date

(SALSEA) Programme ~ Progress to date

Ken Whelan ~ President of NASCO

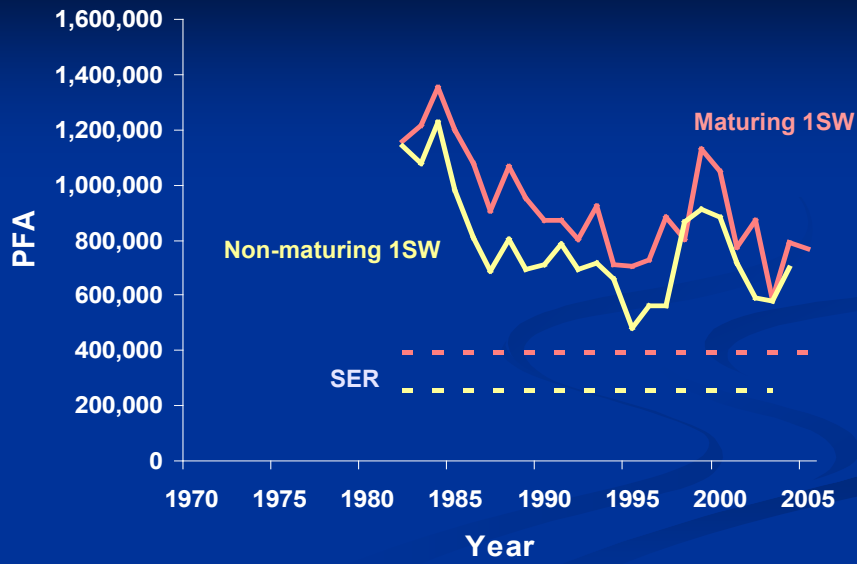
Photograph courtesy of Gilbert van Ryckevorsel

PFA - Southern European stocks



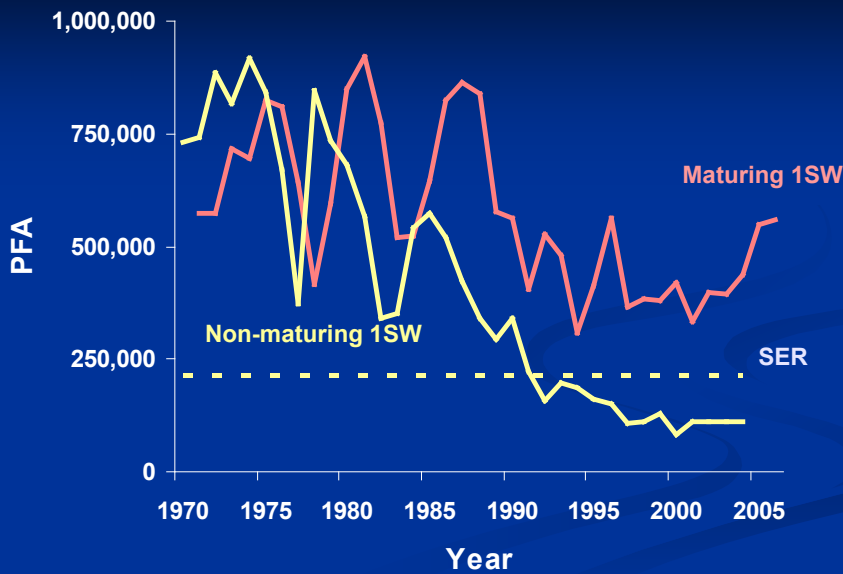
Source: ICES

PFA - Northern European stocks



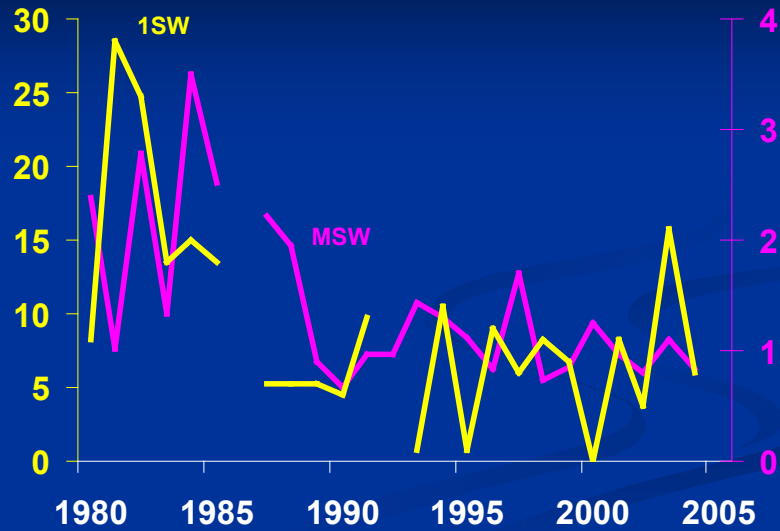
Source: ICES

PFA - North American stocks



Source: ICES

Marine survival – River Corrib



Source: ICES

The SALSEA Work Packages

WP1 - Supporting Technology

- Task 1 – Genetic stock identification
- Task 2 – Sampling equipment evolution
- Task 3 – Signals from scales

WP2 - Early Migration

- Task 1 – Biological characteristics of smolts
- Task 2 – Physical factors in fresh water
- Task 3 – Preparing to migrate
- Task 4 – Key predators
- Task 5 – Impacts of aquaculture

WP3 – Oceanic Distribution

- Task 1 – Theoretical models
- Task 2 – Plan marine survey
- Task 3 – Conduct survey
- Task 4 – Collate and analyse data

WP4 – Communications

- Task 1 – Promoting SALSEA
- Task 2 – SALSEA on-line
- Task 3 – IASRB/NPAFC symposium
- Task 4 – SALSEA report
- Task 5 – SALSEA administration

Why cooperate through SALSEA?

- more efficient sharing of facilities and pooling of expertise
- ability to co-ordinate surveys in time and space
- make best use of existing information
- sum is greater than parts
- the survey programme will concentrate upon areas where stocks from many rivers are thought to be present at the same time, but local studies will also be needed

Progress in promoting SALSEA

- SALSEA Steering Committee established with equal representation from NASCO Parties and NGOs
- case for support prepared in consultation with Brakeley consultants
- approaches made to Organizations and foundations in Europe and North America
- formal applications for funds made to TOTAL Foundation in France , the Ocean Foundation in US, EU FP7 (SALSEA MERGE)
- TOF serving as fiscal sponsor in North America and assisting in identifying eco-vessels

Progress in implementing SALSEA

WP1 : Supporting technology

- Genetic baseline sampling programmes initiated in Canada, Iceland, Ireland, Norway, Russia and UK

Pelagic live and sacrificed capture trawl gear developed by IMR Bergen trialled off the west coasts of Scotland (FRS in 2005) and Ireland (Marine Institute in 2007) in conjunction with Atlantic Salmon Trust

- Ongoing studies using signals from scales in Canada, UK and Iceland

Progress in implementing SALSEA

WP2 : Early migration

- **much ongoing research, largely funded by national agencies and their partners; a need to enhance coordination and stimulate additional financial support**
- **studies of biological characteristics of smolts in monitored rivers**
- **studies on the influence of freshwater contaminants on marine survival in Canada and UK**
- **research on the role of predation by cormorants (US) and seals (UK) and approaches to mitigation**

Progress in implementing SALSEA

WP2 : Early migration

- studies on impacts of sea lice from salmon farms in Ireland and Norway
- numerous studies involving acoustic tagging and detection arrays in Canada, Ireland, Denmark, UK and USA

Progress in implementing SALSEA

WP3 : Distribution and migration at sea

- Norwegian surveys (1982 – 2004) caught ~ 7,000 post-smolts, work on migration modelling underway – Ireland (2007)
- marine surveys for salmon undertaken by US (Gulf of Maine), Canada (Labrador Sea) and UK
- studies with data storage tags in Iceland
- IASRB supported ICES Workshop on the Development and Use of Historical Tagging Information from Oceanic Areas
- Russian studies of by-catch in fisheries for pelagic fish species

By-catch

- near surface mackerel trawl fishery in Norwegian Sea greatest potential for by-catch of salmon
- no new assessment in 2006, further development and data needed
- two sources of data: Russian research trawl catches and Russian observer programmes
- research vessel trawls slower so may be less effective at catching mackerel i.e. over-estimate by-catch
- observers may under-estimate by-catch because of difficulties in observing smolts in large catch of mackerel
- even highest estimate ~5% of combined European PFA
- by-catch in other fisheries (Icelandic survey ~ 5,000 salmon, <0.001% of catch)

Photograph courtesy of Gilbert van Ryckevorsel

Progress in implementing SALSEA

IASRB Workshop held to refine plans for the marine surveys. Specific questions :

- **does early marine growth differ between southern and northern stocks?**
- **does early marine growth differ between post-smolts and those surviving to home rivers?**
- **does condition of fish (lipid levels) differ among stocks?**
- **are fish from different stocks and different areas feeding on different prey?**
- **do disease and parasite characteristics differ between stocks?**
- **do salmon from southern areas differ in heavy metal and organic compound loads from fish originating in other areas?**

Progress in implementing SALSEA

Norwegian Sea and Northwest Atlantic Post-smolt surveys

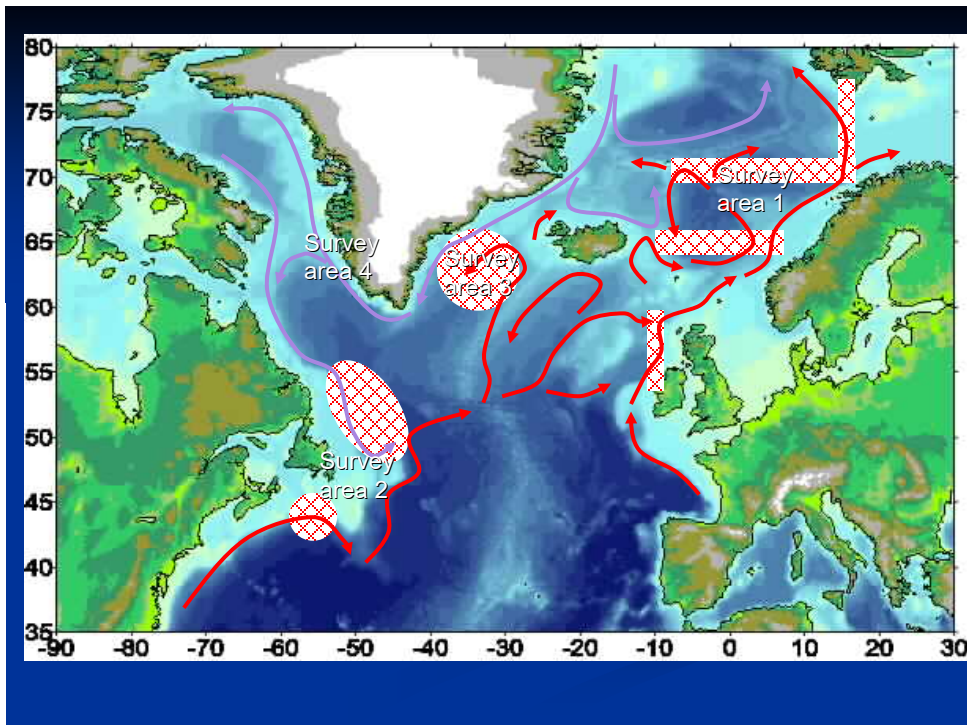
- test whether distribution of post-smolts matches migration model predictions
- repeat transects to provide description of movement of genetically identified stocks throughout the survey area

Distribution of salmon in the Irminger Sea

- describe composition of salmon stocks in the region
- provide data to support development of migration models
- identify stock-specific maturity status

Expanded West Greenland sampling programme

- more comprehensive sampling
- collect data on same cohorts of salmon as sampled in earlier programmes on post-smolts and subsequently on return to home waters
- sampling to be undertaken on smolts leaving and adults returning to fresh water



SALSEA Merge

- application under European Union's Seventh Framework Programme, 20 partners located in Norway Ireland, UK, Faroes, France, Iceland, Denmark, Finland and Spain
- if successful will fund 50% of ship-time and 75% of scientific analyses
- seven workpackages:
 - WP 1 Develop genetic identification methodology
 - WP 2 Marine sample and data acquisition
 - WP 3 Genetic identification of samples
 - WP 4 Biological analysis of samples
 - WP 5 Merge data sets and analysis
 - WP 6 Dissemination
 - WP 7 Project management

SALSEA Merge

WP 1 Develop genetic identification methodology

- integrate existing and new genetic data from across the European range into database of microsatellite and mitochondrial DNA
- investigate the use of new markers - SNPs
- agree on suite of markers to identify origin of salmon
- optimise and validate database and assignment methodology

WP 2 Marine sampling and data acquisition

- 3 cruises X2 years collect biological and oceanographic data
- catalogue and assemble archival tissue for genetic typing
- catalogue and assemble archival scale material for age and growth determinations
- collect biological information including stomach contents from post-smolts sampled
- conduct synchronous plankton surveys

SALSEA Merge

WP 3 Genetic identification of stock origin of samples

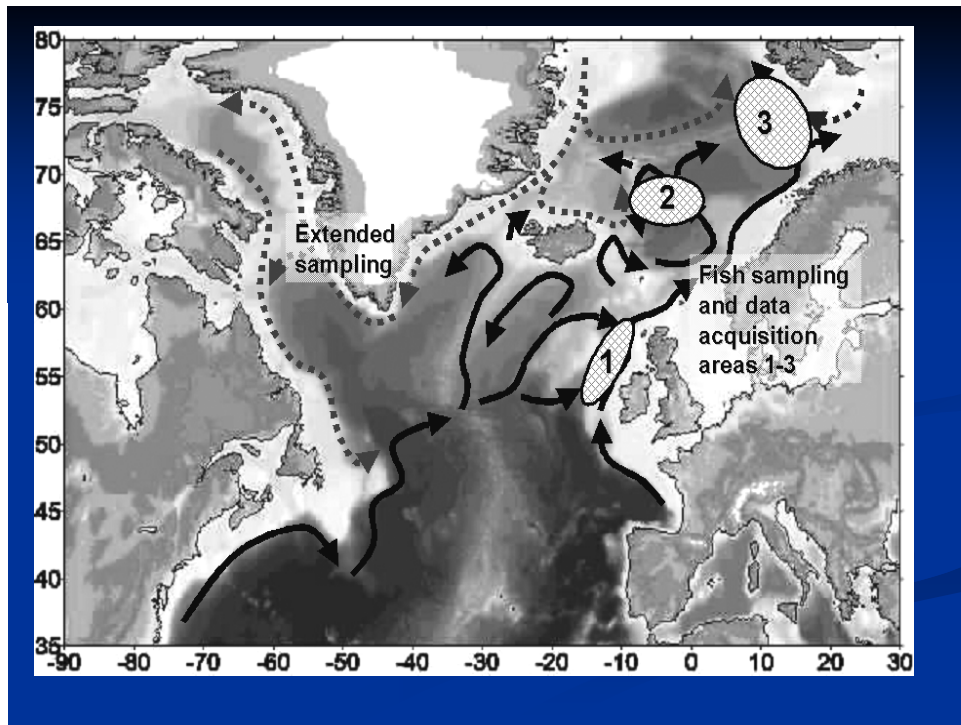
- determine region or river of origin of sampled post-smolts

WP4 Biological analysis of samples

- analyse and rank available food items
- analyse archival scale material
- analyse scale samples collected in WP2
- establish digital scale library
- determine fine-scale growth rates
- undertake dietary analysis and assessment of condition

SALSEA Merge

- WP5 Merge and analyse, genetic, biological and oceanographic data
 - develop models to integrate stock specific distribution and migration patterns
- WP6 Dissemination and Communications
 - SALSEA website www.salmonatsea.com
 - IASRB / NPAFC/ICES/PICES Salmon Summit 2010
- WP7 Project Management



Funding in play

SALSEA estimated cost

- €20.6m
- €7.2m - Parties
- €13.4m – to raise

■ SALSEA – Merge

- EU €3.5m
- Partners €1.6m
- TOTAL €200,000
- AST €210,000
- Full cost: €5.51m
- ASAP €1.6m
- Genetic baseline €1.5m
- MI /AST Cruise 07 €100,000
- IMR / FRS /AST Cruise 05 €150,000

Conclusions

- stimulated a keen interest in marine survival issues
- important new research projects initiated e.g. gear trials and genetic baseline studies
- continuing commitment to inshore work
- promotional documents developed to assist in search for new funds
- commitments from some Parties of vessel time in 2007, 2008 and 2009
- positive signs of early-buy-in from some private sector sources
- major application for funds submitted to EU FP7
- major challenge is to ensure comprehensive programme of marine surveys in north-east and north-west Atlantic in 2008 and 2009, the preparatory work has been done but funds needed to realise the programme

Photo courtesy of Dr R Brown