



SAG(14)10

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

Le Nouveau Monde Hotel, Saint-Malo, France

Monday 2 June 2014

1. Opening of the meeting

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

2. Adoption of the agenda

- 2.1 The SAG adopted its agenda, SAG(14)11 (Annex 2).

3. Election of Officers

- 3.1 The SAG elected Dr Niall Ó Maoiléidigh (European Union) as its Chairman to take office at the close of the meeting.

4. Review of the updated inventory of research

- 4.1 An overview of the updated inventory of research relating to salmon mortality in the sea, ICR(14)2, was presented. For 2014, the total annual expenditure on the 37 ongoing projects (2 are uncosted) is approximately £5.5 million. Approximately 45% of the expenditure is associated with long-term monitoring programmes. There are 75 completed projects in the inventory. Two new projects have been included in the inventory since last year; one concerning sea lice impacts (EU - Ireland) and a study of migration timing of smolts from Penobscot Bay to the Scotian Shelf (US).
- 4.2 The SAG had previously noted that because there is insufficient time available to thoroughly review the inventory at its meetings or at the meetings of the ICES

Working Group on North Atlantic Salmon, to whom the inventory used to be made available, the Board had agreed that review of the inventory should continue to be conducted by a SAG Sub-Group every 3 or 4 years. It was last reviewed in 2012 by the Sub-Group on the Future Direction of Research on Marine Survival of Salmon. If this schedule continues to be followed then the next review of the inventory would be due in 2016 or 2017.

- 4.3 The EU asked if a new column could be added to Table 4 of SAG(14)2 to provide an indication if the entry had direct relevance to management. It was noted that a complete reporting of each entry is available on the Board's Research Inventory website (<http://www.nasco.int/sas/research.htm>) and a lot of information is contained within. However, it would be beneficial to be able to briefly review the summary table and quickly identify what projects have specific relevance to management. It was decided that as part of next year's request to Parties to update the inventory, the Secretariat would also ask each Party to indicate if the inventory entry has management implications. The Secretariat will work with the SAG Chair prior to this request to evaluate the utility of providing other categories that could be assigned to each entry (e.g. assessment related, ecologically related etc.).
- 4.4 Two European Commission funded projects (AquaTrace and EcoKnows) and a number of genetic stock identification (GSI) projects (GSI of Labrador, Saint Pierre and Miquelon and West Greenland (both North American and European origin focused projects) mixed-stock fisheries) were identified as potential candidates for inclusion into the inventory. The Secretariat will coordinate with the appropriate Parties (see Section 4.5) to request inventory submissions for the above referenced projects and will request that any new relevant projects be considered for inclusions prior to posting the finalized inventory by the end of July by the Secretariat.
- 4.5 The SAG agreed that Parties/jurisdictions should be given the opportunity to provide any additional feedback on the inventory to the Secretariat by the end of June, with a view to the inventory being made available on the Board's website by the end of July.

5. Review of project applications for potential funding by the Board

- 5.1 The Secretary advised the SAG that no applications had been received for endorsement from, or funding by, the Board prior to the 31 December deadline. One proposal (SAG(14)7) was received at the end of May, but the SAG did not have time to adequately review it. The proposal was to fund a workshop entitled "Fish Telemetry Workshop for Practitioners". The SAG was not in a position to endorse the proposal and considering the potential overlap of the proposed workshop with the workshop being proposed by the SAG Telemetry Sub-Group, the SAG suggested that if the proposed Telemetry Sub-Group workshop (see Section 7) is pursued consideration could be given to also cover the topics outlined within SAG(14)7. Concerns were raised that the two proposed workshops may not be compatible. If appropriate, the workshop proposed in SAG(14)7 could be considered for support in 2015.

5.2 The Secretary reviewed the Board's financial position. The loan that the Board had made to the Council of NASCO in 2012 (£25,000) had been repaid in full in January 2014. Of the Board's current funds of ~£34,000, it had agreed to make £6,000 available for a possible telemetry workshop. Furthermore, last year the Board had agreed that the unused funds contributed by the US for the purchase of salmon at West Greenland of ~£18,300 should either be returned to the US or the US should be consulted on how it wished to use these funds. The Chairman indicated that the US intended to use the funds to improve the US representation within the North American genetic baseline and for finer-scale origin genetic studies at Greenland. The Chairman indicated that a funding proposal would be developed for this effort and distributed to the SAG by the Secretariat for their information before the request to transfer the funds was made. The Chairman also indicated that progress reports and a final report would be submitted to the SAG as appropriate.

6. Developments in relation to the SALSEA Programme

(a) Report on Progress in establishing a metadata base of salmon survey data and sample collections of relevance to mortality of salmon at sea.

6.1 Last year, the Board had decided that it could play an important role with regard to marine salmon survey data and sample coordination by establishing a metadata base of existing datasets and sample collections. A format for this metadata base had been developed and Parties/jurisdictions were requested to provide relevant information. Limited information had been provided and the SAG had recognised that there may have been some confusion regarding the purpose of the metadata base which is not meant to be a vehicle to provide raw data to researchers and other interested Parties, but rather a means to advertise the availability of the valuable and unique datasets related to the marine phase of Atlantic salmon. A one page information sheet had been developed in order to clarify the purpose of the metadata base. The SAG had also noted the difficulty in identifying a single person to provide information related to a dataset that results from multi-Party/jurisdiction collaboration and that this may have contributed to the poor response.

6.2 Last year, in order to take this initiative forward, a list of candidate datasets for inclusion in the metadata base was developed, specific points of contact were identified and the Secretary was asked to contact the Parties/jurisdictions concerned to request information for inclusion in the metadata base. The Chairman had agreed to follow up with the Parties/jurisdictions concerned.

6.3 The Secretary introduced document SAG(14)3, providing an update on progress since last year. Information has been provided for the candidate datasets and included in the metadata base. In populating the metadata base, a number of suggestions for changes to its structure had been made and new data entry forms and Guidance Notes had been developed. The SAG agreed the changes to the metadata base format, the new data entry form and the guidance notes. The Chairman committed to reviewing the candidate dataset entries for entry inconsistencies and to provide suggested changes and clarifying text for the guidance document. The Chairman will also work with the points of contact to incorporate webpage links for published reports relevant to each entry as available and as appropriate. The SAG also recommended that the Secretariat send out the updated inventory forms and related documents for a final

review with a request that Parties/jurisdictions validate the information provided. The Secretariat will also request the Parties/jurisdictions consider any new datasets that should be considered for inclusion in the metadatabase. A few candidate datasets were identified (West Greenland Sampling Program biological characteristics and SALSEA-Merge PGNAPES, genetic and feeding databases) and the Chairman agreed to work with the appropriate points of contact to complete entry forms for inclusion into the metadatabase as appropriate.

6.4 There was discussion related to increasing the detail of the summary information provided within the metadatabase for each entry and on the need for a secure storage location for the datasets. The SAG recommends that the current metadatabase be finalized and posted on the Board's website prior to initiating any effort to increase the level of details provided for each dataset. The SAG discussed the need for dedicated resources for dataset maintenance and storage within one centralized location, but considered it unlikely that resources could be made available. The SAG recognizes the need for this and will consider the issue in the future.

(b) Progress reports on projects funded by the IASRB

6.4 In 2012, the Board agreed to fund two projects (£6,000 each) as follows:

- A proposal to undertake genetic stock of origin identification of European salmon captured at West Greenland; and
- A proposal for genetic stock identification of salmon caught in the Faroes fishery.

6.5 The funding provided by the Board had allowed these two projects to proceed and had led to other funds being made available for the Faroes Genetic Stock Identification project.

6.6 A report entitled Identification of Genetic stock of origin of European Atlantic salmon captured at West Greenland for the Years 2002 - 2012, SAG(14)5, was presented by the Chair. He informed the SAG that the genetic analysis undertaken in this project suggests that the European element of the West Greenland fishery between 2002 and 2012 consisted predominantly (96%) of fish originating from the NEAC 'Southern European' stock complex. Of these British and Irish fish were the largest group and Scotland is the largest individual country to contribute, providing 66% of the salmon sampled over the period.

6.7 A report entitled Genetic stock identification of salmon caught in the Faroes fishery, SAG(14)6, was presented by Mr Ted Potter (EU). He indicated that DNA had been extracted from 656 scale samples collected during two fishing seasons, 1993/4 and 1994/5 and assigned using 14 microsatellites markers compared to a baseline. At the highest hierarchical level, genetic exclusion analytical techniques and conformation analysis identified 16% of the total samples as being of North American continental origin and 84% as European origin. At the next hierarchical level, 62% of the European fish were identified as coming from northern Europe (Russia, Finland, Norway and Sweden), 37% from southern European (UK and Ireland, France and Spain) and 1% from Iceland. These proportions were scaled to the distribution of commercial catches in the Faroes fishery in an average season between 1983/84 and

1990/91. This analysis indicated that about 56% of the catch in an average year might originate from northern European countries, 26% from southern European countries, 1% from Iceland and 16% from North America.

- 6.8 Mr. Gérald Chaput also presented a brief update on a project that had received funding from the IASRB that used stable isotopes ratios to infer trophic structure and condition of Atlantic salmon during their life at sea. A manuscript entitled “Characterizing the trophic position shift in Atlantic salmon (*Salmo salar*) from freshwater to marine life-cycle phases using stable isotopes” was published in the ICES Journal of Marine Science as part of the ‘Salmon Summit’ symposium proceedings and manuscript entitled “Assessing the use of different marine growth zones of adult Atlantic salmon scales for studying marine trophic ecology with stable isotope analysis” was submitted for publication in Fisheries Research, where it is currently under review. A number of presentations have also been given at various professional forums. Work planned for 2014 includes writing up papers on the diet of West Greenland salmon and differences in stable isotope values in different salmon tissues over time.
- 6.9 The Chair noted that the progress reports for the three studies were greatly appreciated and considered that the obligations for reporting back to the Board had been met.

(c) Progress in analysing samples from the SALSEA Programme

- 6.10 Last year, the SAG Sub-Group on the Future Direction of Research on Marine Survival of Salmon considered that a priority should be to analyze the remaining samples and data arising from the SALSEA Programme and encouraged the Board to explore opportunities to support these analyses. The Board was advised of on-going initiatives to analyse these and recognised that for the remaining samples, it would be important to first clarify what samples are available, how their analysis could benefit management and how much the analyses would cost. The SAG Chairman indicated that he would be willing to collate the requested information and report back to the Scientific Advisory Group.
- 6.11 The Chairman presented SAG(14)8 which contained an inventory of the remaining unprocessed samples from the three main marine components of the SALSEA Programme (SALSEA Merge, SALSEA North America and SALSEA West Greenland). The estimated number of samples available by the three main marine SALSEA components, the initial purpose of the sample and the estimated processing cost (USD) per sample for each sample were also detailed.
- 6.12 The Chairman noted that great progress had been made in analyzing the available biological and tissues samples that had been collected in association with the SALSEA programme marine surveys. A large number and array of different data and samples types were collected from each sampled fish in an effort to maximize the amount of information that could be gained. In many cases the collected data or sample type did not have dedicated funding for its processing or more importantly a dedicated Principle Investigator to oversee its use. However, the SALSEA investigators were successful in facilitating the processing and reporting of most of the data and samples that were collected.

6.13 Of the approximate 40 different types of biological characteristic data or samples that were collected from each sampled fish, there were only approximately 7 different sample types that had not or are not being processed or reported on. Some of these sample types do not have a clear intent or purpose and were collected just in case someone had a need for them. Other samples are archived in various institutions and if funding became available they could be considered for processing. It was noted that the remaining sample types likely did not have direct management implications but if they were processed could instead add to our understanding of the ecology of marine phase salmon. The SAG was encouraged to continue to advertise the existence of these samples in an attempt to find a researcher that may be interested in them. However, the SAG agreed that the SALSEA Programme has been a very successful endeavor and that the majority of the collected data and material had been (or currently is being) analyzed. The SAG decided that there was no need to recommend that the Board identify additional funds to process these remaining SALSEA samples.

(d) Other activities

6.14 Mr. Dave Meerburg reported that the Atlantic Salmon Federation (ASF) has continued to assess estuarine and marine survival of tagged Atlantic salmon released in rivers of the Gulf of St. Lawrence using acoustic tags and pop-up satellite tags. In 2014, the ASF along with numerous collaborators will continue their tracking efforts in Eastern Canada with smolts (three rivers) and kelts (two rivers) with a few of these kelts also fitted with satellite pop-up tags. In addition to the information on timing and numbers of fish leaving the rivers, estuaries and the exits of the Gulf of St. Lawrence, it is noteworthy that tagged salmon are also being recorded by receivers primarily being used for studies on other species. Detections were also noted by a wave glider deployed in the Gulf of St. Lawrence in the summers of 2012 and 2013 by the Ocean Tracking Network. In one example, a Miramichi kelt was tagged and released into the Miramichi in April 2010. It was detected leaving the river in early May, it presumably passed through the Strait of Belle Isle in early July (undetected), was detected in January 2011 by a project studying cod in Notre Dame Bay, Newfoundland, was detected in April 2012 crossing the Cabot Strait into the Gulf of St. Lawrence and entered the Miramichi River in late spring to spawn as alternate repeat spawner. In another example, a study on grey seals of Sable Island has attached receivers and transmitters on to 97 seals between 2009 and 2013 and six of these grey seals have been recorded using the Gulf of St. Lawrence and have detected ASF tagged Atlantic salmon smolts and kelts there. Detections of sonically tagged cod, Atlantic sturgeon, American eel, Bluefin tuna, porbeagle shark, blue shark and snow crab were also documented. These detections have greatly increased the data collected from ASF tracking efforts and highlight the benefits from increased collaboration and communication with researchers tracking a variety of other marine species.

7. Report of the SAG Telemetry Sub-Group

7.1 Last year, the SAG Sub-Group on the Future Direction of Research on Marine Survival of Salmon had proposed that a particular focus for the Board should be studies to partition mortality of salmon among the phases of the marine migration and it recommended that the Board should consider whether it wished to facilitate a

meeting of scientists and external partners to further develop a collaborative international programme of research. A preliminary outline proposal was provided and the aim would be to identify where there may be particular need for international collaboration and coordination and support with fund raising. ICES had recommended that the IASRB support the further development of the project outlined by the SAG Sub-Group.

7.2 The Board had established a SAG Telemetry Sub-Group which was asked to work by correspondence (or hold a workshop, possibly partially funded by IASRB) to develop and document a roadmap outlining a large scale international collaborative telemetry project to ultimately provide information on migration paths and quantitative estimates of mortality during phases of the marine life-cycle of salmon. This document should:

- identify how this project will support the conservation and management of Atlantic salmon stocks (i.e. what outputs will be produced and how these will improve Atlantic salmon management);
- provide an overview of the resources required with provisional costings;
- identify key strategic partners for this project;
- identify current and proposed telemetry programmes that could be linked with and enhanced by the proposed project.

7.3 The Chairman of the SAG Telemetry Sub-Group, Mr Ted Potter (EU), presented the Sub-Group's report, SAG(14)4 (Annex 4). He indicated that the Sub-Group had developed a 'roadmap' for an international acoustic tracking programme, describing: the objectives of the study and its potential benefits; the experimental methods, equipment and approximate costs; the areas where the study might take place and the potential collaborators and partners; the risks; and the next steps for taking the proposal forward. The Sub-Group concluded that this is a novel and exciting project proposal that has the potential to answer key questions relating to the conservation and management of Atlantic salmon. It will have a high profile, being dependent upon extensive international collaboration and partnerships between scientists and industry. There is also great potential to collaborate with researchers and organizations focused on a variety of other marine species that utilize the North Atlantic and Arctic Oceans. The Sub-Group believes that it will further raise the profile of NASCO as a leader in marine resource management but it is also a very challenging study which, while partly based upon established methods, will also require the development of new methods for detecting tagged fish in the open ocean. The Sub-Group has recommended that the next steps include the IASRB: agreeing to the need for a large scale tracking effort; appointing co-convenors to establish one or more Workshops partially funded by IASRB (£6,000 was made available last year for this purpose) to discuss the further development of the programme; and agreeing on clear Terms of Reference for the Workshop.

7.4 The SAG endorsed the recommendations of the Telemetry Sub-Group.

7.5 It was noted that SALSEA Programme had become a well known and well advertised project of NASCO. Casting the international acoustic tracking programme as the logical next steps of SALSEA may aid in raising the profile of the programme. This

association could help garner support for the implementation of the program and may increase the help with fund raising in the future.

8. Other business

8.1 There was no other business.

9. Report of the meeting

9.1 The SAG agreed a report of its meeting.

10. Date and place of the next meeting

10.1 The SAG agreed to hold its next meeting in conjunction with the Thirty-Second Annual Meeting of NASCO.

10.2 In closing the meeting, the Chairman thanked the participants for their contributions to the meeting. The SAG expressed its appreciation to Mr Sheehan for his excellent work in Chairing the Group's work over the last four years.

List of Participants

Canada

Bud Bird

Gérald Chaput

Denmark (in respect of the Faroe Islands and Greenland)

Jóannes Hansen

Anna Hofgaard

Katrine Kaergaard

European Union

Francesca Arena

Cathal Gallagher

Niall Ó Maoiléidigh

Ted Potter

Stamatis Varsamos

Norway

Peder Fiske

Russian Federation

Sergey Prusov

US

Tim Sheehan (Chairman)

NGOs

Dave Meerburg

Ken Whelan

Secretariat

Peter Hutchinson

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