

**REPORT OF THE
STUDY GROUP ON SALMON SCALE
READING PROBLEMS**

By correspondence

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2000 Report of Study Group on Salmon Scale Reading Problems:

1 STATEMENT BY CHAIR

i) The Study Group was established by resolution C.Res 1999/2H06 as follows:

2H06 A **Study Group on Salmon Scale Reading Problems** [SGSSR] will be established (Chair: Dr E. Ikonen, Finland) and will work by correspondence in 2000 to:

- a) improve the accuracy of the scale-reading;
- b) promote the development of scale reading methodology in the Baltic Sea region;
- c) prepare an evaluation of the accuracy in scale reading;
- d) review the results from the Workshop on the Usefulness of Scale Growth Analyses and Other Measures of Condition in Salmon [WKUS].

SGSSR will report to WGBAST and to the Baltic Committee at the 2000 Annual Science Conference.

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Justification

Problems in ageing and stock discrimination in scale-reading were pointed out in the report on the Second Scale Reading Workshop on Baltic Salmon (SSRWBS) (C.M. 1999/H:6).

The correct ageing of salmon (sea age) guidelines are in the reports of the two Atlantic salmon scale reading workshops held in 1984 and 1988 under the auspices of the ICES. These workshops produced the Atlantic salmon scale reading instructions (Shearer, ed. 1992). However, they were produced mostly for the scale interpretation of salmon in the Atlantic area. When Baltic salmon scales were subjected to these guidelines, the scale pattern was so different in most cases that they were rejected for application to Baltic salmon.

Concerning stock discrimination, computer aided scale reading techniques are helpful. However, experience is needed in scale pattern analyses before this technique can be effectively utilised. At the moment this computer-aided scale reading technique is only available in Finland among the laboratories working with Baltic salmon.

- ii) In the intersessional period, new scale material has been collected and problem scales have been discussed between laboratories, but mainly this has been bilateral co-operation. SGSSR activities have concentrated on data collection and data analyses.
- iii) The list of nominated members is empty, so renewed efforts must be made to secure members to make the Study Group viable.
- iv) Activities in this field have been very low because we agreed already during the workshop that in 2000 work should be by correspondence only.
- v) In order to ensure a successful continuation of the work of this Study Group, the Chair will be contacting all possible member candidates of the Study group. He will ask them to ensure that national delegates provide their nomination to the ICES Secretariat.
- vi) The WKUS has handled matters which are very relevant to the Baltic salmon scale interpretation; ageing of salmon with scales, scales as growth indicators, growth dynamics with hatchery stocks, post-smolt studies, scale growth and linkage to environmental and seasonal effects. It also discussed its work in relation to the linkages to salmon management. It seems that there are many areas in common between work of WKUS and SGSSR and co-operation in some form would be very fruitful. The list of participants at the workshop suggests that much work addressing these issues are underway in the USA and Canada. It is hoped that SGSSR can continue to develop its work in close collaboration with the Workshop's co-chairs (J.C. McLean and K.D. Friedland) as there are a number of common problems resulting in possible common solutions.

vii) I propose the following draft resolution for a meeting of the Study Group in 2001:

The **Study Group on Salmon Scale Reading Problems** (SGSSR) (Chair: E. Ikonen, Finland) will meet in Helsinki, Finland from 12-14 November 2001 to:

- a) review and discuss the progress in Baltic salmon scale interpretation;
- b) review the results from the Workshop on Usefulness of Scale Growth Analyses and Other Measures of Condition in Salmon (WKUS – C.Res 1998/2:60);
- c) select material for the evaluation of the accuracy in scale reading.

Supporting information

Priority:	Scale reading problems must be addressed urgently in order to direct the Baltic salmon fishery to those populations which sustain more exploitation
Scientific Justification:	<p>The salmon fishery in the Baltic Sea has been regulated by overall TAC. Due to many weak populations TAC must be restricted despite the fact that all reared populations, and during recent years also some wild populations in large rivers, could be harvested more efficiently. To direct fishery to those populations which sustain more exploitation, there is needed a method to distinguish salmon belonging to those from the others. At the moment there are no good methods available and in practise scale pattern analyses seem to be the only way to go further in this field. The first task would be to separate wild and reared fish in the catches. If this cannot be reached, there are no possibilities to increase catches without endangering wild populations seriously in the present fishery. However, releases of hatchery reared salmon are increasing all the time and demands of higher TACs are getting stronger. The second step would be to develop scale pattern analyses to that level where in which major wild populations could be separated from the others and after that direct increased fishery to those populations.</p> <p>Atlantic salmon populations in the Baltic Sea rivers support smolt run which is about 10 % of the total smolt production which comes from hatcheries. Restrictive fishery regulations have resulted a recovery of many populations especially in large rivers. However, most of the salmon populations in small rivers are still so weak that effective fishery regulations are needed. Salmon released from hatcheries should be harvested effectively because smolt releases have mainly been carried out to improve commercial fishery in the sea. On the other hand, exploitation of the wild salmon populations needs regulatory measures to maintain spawning run in all rivers. Hatchery-reared smolt have mostly been released into the river which have been closed by hydro-electric power plants. Restrictive fishery regulations in the offshore and coastal fisheries have related increased amount of reared salmon to enter the river mouths where these fish have been released as smolt. Unable to enter closed rivers, there is a danger that these fish could stray nearby rivers supporting weak wild salmon populations and mix the population structure. To increase harvesting of these reared fish, it is important to find out where and when fishery can be directed to catch reared salmon as much as possible.</p> <p>The scale pattern has been used to discriminate wild salmon from those originating from releases. This method seems to be fairly reliable when dealing with northern populations (Gulf of Bothnia) However, not enough experience and known origin samples are available representing other salmon populations. Also skills to do reliable scale interpretation are varying between laboratories around Baltic Sea.</p> <p>Life history of salmon parr and smolt in fresh water as well as life history in marine environment will produce a typical scale pattern. Normally scientists working with their "own salmon populations" have opportunity to collect material from their known origin salmon and also interpret those scales. However, concerning knowledge of foreign salmon populations, it is normally poor and possibilities to get more information and known origin data are restricted. Therefore, international co-operation is the most effective way to interpret salmon scale originating from different populations and different life histories. SGSSR is the forum where this needed international co-operation can be achieved. Scientists and technicians participating SGSSR meeting can teach others the details of their own salmon populations and reflections to the salmon scales as well as get similar information of the other salmon populations in the Baltic Sea.</p>

Relation to Strategic Plan:	The work of SGSSR is closely related to the advisory role of ICES. The International Baltic Sea Fisheries Commission is at the moment dealing with matter of new harvesting strategies of Baltic Salmon. The main question is how to direct fishery better towards the reared populations and what are the amounts of reared fish available for fisheries. This kind of matters could be requested from ICES by the IBSFC. Better knowledge how to discriminate different populations in catches will be very essential question.
Resource Requirements:	<p>All countries having salmon smolt production and/or salmon fishery in the Baltic Sea are candidates to nominate members to this study group. Members representing other geographical areas are of course very welcome to contribute the study group.</p> <p>During the meeting of the Second Scale reading Workshop in November 1998 when establishment of the study group was discussed, it was stated that meeting place should be circulated between laboratories. Therefore, the hosting cost will be divided between member countries. It was also discussed that the Study Group meeting should be organised every second year and every second year the Group should work by correspondence.</p>
Participants:	The work is partly very technical and therefore especially those scientists and/or technicians, who are working in practise with salmon scale reading, are needed. On the other hand knowledge of the life history of different populations is important and therefore scientists, experts in this field are expected members of SGSSR. Therefore, one or two persons from all member countries around the Baltic Sea are expected. Additionally scientists working with computer aided scale interpretation are very welcome to join the Study group to bring new techniques to the scale interpretation.
Secretariat Facilities:	No extraordinary demands
Financial:	No direct costs to ICES
Linkages To Advisory Committees:	Discrimination of wild and hatchery-reared salmon in catches in different fisheries is important matter when giving advise for salmon fishery in the Baltic Sea. Therefore linkage Baltic salmon and trout assessment working group/ACFM is obvious.
Linkages To other Committees or Groups:	<p>Living resources and Baltic Committee- life histories of salmon populations migrating in different parts of the Baltic Sea and reflections to the scale patterns.</p> <p>Resource Management Committee- utilisation of Atlantic salmon resources in relation to the status of wild populations in the Baltic Sea.</p> <p>WGBAST-basic element for advisory work.</p> <p>Similar work has been carried out in the Atlantic area. Partly work seems to be overlapping but when comparing scale patterns between salmon populations in Atlantic and Baltic river populations experiences suggest that differences in scale pattern are so extensive that salmon scales from Baltic and Atlantic should be handled separately. Basic techniques developed in both areas support work carried out with Baltic and Atlantic populations.</p>
Linkages to other Organisations	International Baltic Sea Fisheries Commission/Salmon Action Plan Surveillance Group/Advisory Sub-Group - new harvesting strategies of salmon in the Baltic Sea is under planning. Stock discrimination is an essential element when planning new salmon fishing strategies.