

# ICES SGBFFI Report 2005

ICES Baltic Committee

ICES CM 2005/H:05

Ref. ACFM, ACE

## Report of the Study Group on Fish and Fisheries Issues in the BSRP (SGBFFI)

9–13 June 2005

Riga, Latvia



International Council for the Exploration of the Sea  
Conseil International pour l'Exploration de la Mer

**International Council for the Exploration of the Sea**  
**Conseil International pour l'Exploration de la Mer**

H.C. Andersens Boulevard 44-46

DK-1553 Copenhagen V

Denmark

Telephone (+45) 33 38 67 00

Telefax (+45) 33 93 42 15

[www.ices.dk](http://www.ices.dk)

[info@ices.dk](mailto:info@ices.dk)

Recommended format for purposes of citation:

ICES. 2005. Report of the Study Group on Fish and Fisheries Issues in the BSRP (SGBFFI), 9–13 June 2005, Riga, Latvia. ICES CM 2005/H:05. 61 pp.

For permission to reproduce material from this publication, please apply to the General Secretary.

The document is a report of an Expert Group under the auspices of the International Council for the Exploration of the Sea and does not necessarily represent the views of the Council.

© 2005 International Council for the Exploration of the Sea

## Contents

---

<b>Executive Summary .....</b>	<b>1</b>
<b>1 Introduction .....</b>	<b>3</b>
1.1 Participation.....	3
1.2 Terms of Reference .....	3
1.3 Activities of BSRP related to SGBFFI 2004 recommendations .....	4
<b>2 Baltic herring growth modelling .....</b>	<b>6</b>
2.1 Herring growth database.....	6
2.2 Environmental data .....	7
2.3 Analysis of temporal and spatial variability .....	7
2.4 Analysis of the effect of environmental variables on $CF_{20}$ .....	9
2.5 Statistical modelling .....	10
2.6 Discussion.....	12
2.7 Future growth modelling for stock development forecasts.....	12
<b>3 Environmental parameters affecting herring population dynamics .....</b>	<b>13</b>
3.1 Gulf of Riga herring .....	13
3.2 Herring in the Bothnian Sea .....	17
3.3 Herring in the Gulf of Finland.....	18
3.4 Herring stocks in the Baltic proper .....	18
<b>4 Compilation of historical data on Baltic fish species .....</b>	<b>19</b>
4.1 Cod otolith weight data.....	19
4.2 Cod stomach analyses.....	20
4.3 Data requirements from ecosystem surveys .....	21
4.4 Historical stock assessment data of cod.....	21
4.5 Status of coastal fish meta-database .....	22
<b>5 Fish stock dynamic in the coastal zone .....</b>	<b>22</b>
5.1 Environmental effects on coastal fish stocks .....	22
5.1.1 Update of existing knowledge on environmental processes affecting dynamics of coastal fish species .....	22
5.1.2 Suggestions from the ICES BSRP SGBFFI to the HELCOM Thematic assessment report on coastal fish .....	25
5.2 Data on population structure of non-assessed commercial fish stocks in the Baltic .....	26
5.2.1 Results of the completed studies by fish species .....	26
5.2.2 Ongoing research .....	29
5.2.3 Ongoing stock assessments of coastal species .....	30
5.2.4 Gaps in knowledge .....	31
5.3 Investigation of herring spawning grounds in the Baltic Sea .....	31
<b>6 Regional integrated assessment and research organisation in the Baltic Sea within and outside ICES .....</b>	<b>34</b>
<b>7 Evaluation of first joint SGMAB and SGBFFI meeting .....</b>	<b>38</b>
<b>8 Conclusions and recommendations.....</b>	<b>38</b>

<b>9</b>	<b>References .....</b>	<b>39</b>
	<b>Annex 1: List of participants .....</b>	<b>45</b>
	<b>Annex 2: Coastal fish data meta-file .....</b>	<b>47</b>
	<b>Annex 3: Draft 2005 Resolution (Category 2) .....</b>	<b>56</b>

## Executive Summary

---

The Study Group on Fish and Fisheries Issues in the BSRP (SGBFFI) addressed all Terms of Reference. Concerning open sea fish species (herring, sprat and cod) the main effort was allocated to growth modelling of Baltic herring (i), environmental factors affecting fishes recruitment (iii) and status of compilation of the Baltic fish historical data that are partly financed by Baltic Sea Regional Project (iii).

The Study Group made an inventory on available time-series on zooplankton abundance, hydrography and mean weights-at-age to start a meta-analysis of growth changes of Baltic herring and sprat and suggested possible ways of growth modelling for stock development forecasts. Concerning environmental factors affecting fish recruitment the Study group mainly focused on different Baltic herring populations and summarized presently available knowledge.

Due to significant age reading inconsistencies of the Baltic cod between the countries it is considered that an alternative method for cod age reading could be based on otolith weight data. The Study group reviewed the status of cod otolith weight data compilation that was agreed during SGBFFI meeting in 2004. As a result was suggested:

- 1 ) For commercial fishery data (2001–2004): It is necessary by national laboratories to prepare and upload otolith weight data in FishFrame database. Deadline – November 2005.
- 2 ) For research survey data (2001–2004): It is necessary to prepare a haul based size distribution of cod from research surveys in March and November BITS surveys.

The Study group updated existing knowledge on environmental processes affecting dynamics of coastal fish species. In addition, most important gaps in the current knowledge that should be considered when planning/designing future research activities are also provided. These are: (1) rates and patterns of impact of fish and invertebrate invasions on native coastal fish species/communities, (2) predation of coastal fish by marine mammals and fish-eating birds, (3) coastal-open sea trophic interactions, (4) food-web interactions in coastal areas and (5) factors affecting formation of recruitment of coastal fish species. One of the most important outcomes of the meeting was providing suggestions for improvement of the HELCOM Thematic assessment report on coastal fish. The SG response was structured into two major sub-items (1) General comments for the topic and (2) Specific comments on the report. The recent evidence suggests that the provided suggestions are being considered by the authors of the HELCOM report.

It appeared that there exists quite a lot of information on population structure of non-assessed commercial stocks, especially for the most valuable coastal species like pikeperch, flounder and vimba. Despite of significant role of other coastal fish species like perch, roach, eel in the coastal environment and fishery, relevant research activities of those species have been weak in the past. Gaps in knowledge for several species (like eel, perch, European whitefish and twaite shad) will be improved by currently ongoing activities in several regions in the Baltic Sea. Overview on ongoing stock assessment (of other fish than cod, herring, sprat and salmon) shows that at least 18 stocks of various fish are currently being assessed with the most significant activities in Poland, Russia, Finland and Sweden and with no respective ongoing activities in Estonia, Latvia and Lithuania.

The meeting finalised the coastal fish meta-database. The database has divided into three sections: experimental surveys on (1) warm-water and (2) cold-water fish and (3) commercial sampling. The database format is slightly different for the above three sub-parts. The following countries have submitted the information: Estonia, Finland, Latvia, Lithuania, Poland, Russia and Sweden.

Strategic coordination and planning activities were conducted together with SGMAB and addressed first specific actions like the organization of a common cod stomach sampling program, and data requirements from future ecosystem oriented surveys. Secondly structural requirements for conducting a regional integrated assessment of the Baltic Sea were discussed. This resulted in a suggestion to restructure the WG and SG group set-up underneath the Baltic and Advisory Committees. This suggestion should be seen as a starting point of a discussion in a broader forum rather than a well defined plan.

Finally, the Study Group suggested that for next year's meeting, more effort should be allocated to fish species that have strong open sea and coastal interactions e.g., Baltic herring and flounder.

## 1 Introduction

---

### 1.1 Participation

#### SGMAB and SGBFFI members

Tatjana Baranove	Latvia	(SGBFFI)
Massimiliano Cardinale	Sweden	(SGBFFI & SGMAB)
Margit Eero	Estonia	(SGBFFI & SGMAB)
Valeri Feldman	Russia	(SGBFFI & SGMAB)
Georgs Kornilovs	Latvia	(SGBFFI & SGMAB)
Atis Minde	Latvia	(SGBFFI)
Christian Möllmann	Denmark	(SGBFFI & SGMAB)
Bärbel Müller-Karulis	Latvia	(SGBFFI & SGMAB)
Henn Ojaveer (Co-Chair)	Estonia	(SGBFFI)
Wojciech Pelczarski	Poland	(SGBFFI)
Maris Plikshs (Co-Chair)	Latvia	(SGBFFI & SGMAB)
Rimantas Repecka	Lithuania	(SGBFFI)
Włodzimierz Grygiel	Poland	(SGBFFI & SGMAB)
Tiit Raid	Estonia	(SGBFFI & SGMAB)
Yvonne Walther	Sweden	(SGBFFI)
Tomas Zolubas	Lithuania	(SGBFFI)

The full list of participants is represented in Annex 1.

### 1.2 Terms of Reference

According to Annual Science Conference Resolution in 2004 (C.Res 2004/2H05), A Study Group on Baltic Fish and Fisheries Issues in the BSRP [SGBFFI] (Co-Chairs: Maris Plikshs, Latvia and Henn Ojaveer, Estonia) will meet in Riga, Latvia, from 9–13 June 2005 to:

- a) finalize the inventory on available time-series on zooplankton abundance, hydrography and mean weights at-age, start a meta-analysis of growth changes of Baltic herring and sprat and suggest possible ways of growth modelling for stock development forecasts;
- b) produce a status summary on and identify gaps in operational models for use in stock projections for eastern Baltic cod, sprat and herring which include ecosystem variability;
- c) produce a status summary on and identify ways to promote progress in compiling and computerizing historic data from research vessels surveys, commercial catches, fish stomach analyses and otolith biometric studies;
- d) update status of and identify gaps in compiling meta-databases of coastal fish:
  - i) for commercial sampling by country, region, species, years, parameters measured and calculated indices,
  - ii) for experimental sampling by country, region, purpose of the study, species, years, parameters measured and calculated indices.
- e) update existing knowledge on environmental processes affecting dynamics of coastal fish species;
- f) summarize and identify gaps in knowledge of population structure of non-assessed commercial stocks;
- g) compile and summarize available information on environmental condition of herring spawning grounds, with particular emphasis on loss of spawning habitat and population subcomponents;

- h) plan its meeting in 2005 or 2006 as a joint or overlapping meeting with at least one other Baltic Study Group (e.g., SGPROD, SGGIB, SGBEM, SGMAB).

SGBFFI will report by 13 July 2005 for the attention of the Baltic Committee, ACFM and ACE.

### 1.3 Activities of BSRP related to SGBFFI 2004 recommendations

ICES began the implementation of the Large Marine Ecosystem Activities with the formation of a Planning Group on the Implementation of the Baltic Sea Regional Project and the formation of four study groups to support the BSRP (Study Group on Baltic Fish and Fisheries Issues in the BSRP [SGBFFI], Study Group on Baltic Sea Productivity Issues in support of the BSRP [SGPROD], Study Group on Baltic Ecosystem Health Issues in support of the BSRP [SGEH], Study Group on Baltic Ecosystem Model Issues in support of the BSRP [SGBEM]).

The ICES SGBFFI was established with aim of setting a scientific basis for implementation of BSRP plans in relation to Fish and Fisheries issues and the coordination is done by Fish and Fisheries coordination centre (CCFF).

Under the CCFF are 4 lead laboratories (LL):

- 1) ICES surveys in Kaliningrad;
- 2) Coastal Activities in Tallinn;
- 3) Fish age and Stomach analyses in Riga;
- 4) Salmon River restoration in Riga.

BSRP implementation and establishment of CCFF and LL has been started in February 2004. Only LL on ICES surveys in the Baltic was established in August 2004.

During first year of work the main directions in the CCFF and LL was concentrated in following directions:

- 1) improvement of age reading of commercial fish species;
- 2) historical fish biological data compilation from commercial and research surveys;
- 3) improvement of area coverage of Baltic international hydro-acoustic surveys;
- 4) coordination and improvement of coastal fish monitoring network;
- 5) upgrade of national laboratories of Eastern Baltic countries with equipment.

Age reading of the Baltic herring was continued. This was previously done by the SG on Baltic herring age reading. At first a group of national experts was established. Secondly, eight herring otolith samples was prepared and aged by national experts. Results were discussed during EU herring age reading workshop in Finland, June 2005. In principal the age reading of herring is quite consistent and otolith sample regular exchange helps to maintain the present level.

Similar activities were performed in relation to sprat. Presently exchange of otolith collection is ongoing. The age reading workshop is planned during autumn 2005 or early 2006.

Concerning other fish species, the perch which is probably the most widespread commercial species in the coastal zone, age reading workshop was held in Riga, February 2005. Additionally the flounder age reading workshop is planned in January–February 2006.

In relation to cod based on recommendations of SGBFFI 2004 and SGABC 2004 was initiated otolith weight data collection from 2001–2003 research surveys and commercial fishery sampling. It is considered that due to significant inconsistencies in age reading of the Baltic cod national age readers (the agreement between separate readers is low, mainly below 60% - based on SGABC results) the cod otoliths weights could be the only independent and age portioning method. In this respect the technical assistance possibilities was used from LL and









































































































