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SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF) OPINION BY WRITTEN PROCEDURE

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REVIEW OF SCIENTIFIC ADVICE FOR 2010

ADVICE ON STOCKS IN THE BALTIC SEA

(SGECA/SGRST- 09-01)

June 2009, EVALUATED BY THE STECF BY WRITTEN PROCEDURE

Edited by Eskild Kirkegaard & Tiit Raid

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OPINION OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES BY WRITTEN PROCEDURE

ADVICE ON STOCKS IN THE BALTIC SEA

June 2009

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1. INTRODUCTION

The STECF SGRST/ECA -09-01 met in Carlottenlund (Denmark) to review the scientific advice given by the ICES on Baltic Sea stocks and fisheries. STECF was requested to review the report of the SGRST-09-01 meeting, evaluate the findings and make any appropriate comments and recommendations by written procedure.

1.1. Terms of reference

The STECF RST/ECA Working Group 09-01 is requested to review, comment, modify and complete, as far as needed, released scientific advice for the following Baltic Sea stocks in 2009 – 2010.

STECF is requested, in particular, to pinpoint possible inconsistencies, if any, between the assessment and the ICES (ACOM) advice.

In addition, when examining available scientific advice and when commenting them, possibly reviewing them or when writing some recommendations, STECF will have to take care of the Communication from the Commission COM(2009) on a consultation on fishing opportunities for 2010 (see documents supporting terms of reference).

Baltic Sea stocks

- Stocks of
  - Cod in subdivisions 22-24
  - Cod in subdivisions 25-32
    - *In regard to Baltic Sea Cod, STECF is requested to pay specific attention to the following question: What would be the fishing mortality rate after reduction or increase of the effort, in accordance with cod multiannual management plan, from 2009 to 2010 for each of the ICES subdivisions 22-24 and 25-28. The relation between the allowed fishing effort and necessary effort to fish out the TAC resulting from the management plan.*
  - Herring in ICES division IIIa & subdivisions 22-24
  - Herring in subdivisions 25-29 (excluding Gulf of Riga) & 32
  - Herring in the Gulf of Riga
  - Herring in subdivision 30 (Bothnian Sea)
  - Herring in subdivision 31 (Bothnian Bay)
  - Sprat in subdivisions 22-32
  - Flounder
  - Plaice
  - Dab
  - Turbot in subdivisions 22-32
  - Brill in subdivisions 22-32
  - Salmon in subdivisions 22-31 (Main basin & Gulf of Riga)
  - Salmon in subdivision 32 (Gulf of Finland)
  - Sea trout

In addition, it has been agreed between the DG Mare and the STECF that the opinion of the STECF plenary on scientific advice to be reviewed for Baltic Sea stocks will be delivered through a written procedure and should have to be provided to the Commission by June 26, 2009.

1.2. Participants

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2. RESOURCES IN THE BALTIC SEA

2.1. Brill(*Scophthalmus rhombus)* in the Baltic Sea (Subdivisions 22-32)

FISHERIES: The brill fishery is carried out mainly by Denmark in Subdivision 22. Total reported landings have fluctuated between 1 and 160 t. It can be assumed that the total landings of brill reported for 1994-1996 are over-reported due to species-misreporting in the landings of the directed cod fishery.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: There are no precautionary reference points proposed for brill in the Baltic.

STOCK STATUS: The stock status is unknown. The only information available for this stock is landing statistics.

MANAGEMENT OBJECTIVES

No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: The available data are insufficient for assessing the current stock size and exploitation, and ICES gives no management advice on the brill stocks in the Baltic.

STECF COMMENTS: STECF has no comments.

2.2. Cod (*Gadus morhua*) in the Baltic Sea (Subdivisions 22-24)

FISHERIES: Cod in Subdivisions 22-24 is exploited predominantly by Denmark and Germany, with smaller catches taken by Sweden and Poland. The fishery is conducted by trawl and gillnets. Landings fluctuated between 40,000 and 54,000 t from 1965 to 1985, falling in the late 1980s reaching a record low value in 1991. Landings increased again until 1995 where they reached 51,000 t. After 1995 landings have declined again and have in recent years been between 20,000 and 24,000 t.

The fishery has in former years largely been based on recruiting year-classes and 4 years and older fish constituted less than 15 % of the landings in numbers. In 2007 and 2008 the proportion of older age groups has increased and app. 40 % of the number of fish landed were 4 years or older. ICES has estimated discards in 2008 to 5 % of the total catch in weight and 14 % when measured in numbers. The majority of the discards are undersized cod and there is no indication of high grading.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial as well as survey data. A new assessment model (SAM) was used in this year's assessment. The model provides statistically sound estimates of uncertainties in the results.

REFERENCE POINTS: The proposed precautionary reference point for spawning biomass is B_{pa} = 23,000 t. The basis for B_{pa} is MBAL (minimum biological acceptable level of SSB). ICES consider that B_{lim}, F_{pa} and F_{lim} are not yet defined.

MANAGEMENT AGREEMENT: The EC has agreed on a management plan for cod in the Baltic Sea in September 2007. For Western Baltic cod the aim is to reach a fishing mortality rate at levels no lower than 0.6. This should be reached by fixing the TAC consistent with an annual reduction in F by 10% and by annually reducing the total number of days a vessel can fish in the area by 10 % until the target F of 0.6 has been reached. The plan sets a maximum change of 15% of the TAC between consecutive years, unless the fishing mortality is estimated to be higher than 1.

In addition to the rules for setting the TAC and fishing effort the plan includes a number of control provisions and only two types of trawls (BACOMA with 110 mm square mesh panel and T90) are allowed in the cod trawl fishery.

ICES evaluated the plan in 2009 and considers it is in accordance with the precautionary approach.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to high long term yield	Fishing mortality in relation to agreed target reference points	Comment
Increased risk	Undefined	Over-exploited	Above target	EU Management plan implemented in 2008 with target fishing mortality of 0.6

Based on the most recent estimates of SSB, ICES classifies the stock as being at risk of reduced reproductive capacity, with the spawning stock being below $\mathbf{B}_{pa}$ in 2009. F in 2008 was estimated to be 0.83 and has decreased by 30 % since 2000. F is, however, still well above the target F of 0.6.

The year classes 2004 – 2007 are among the weakest in the time series. Although the 2008 year class is estimated to be the highest since 2003, it is still below average.

RECENT MANAGEMENT ADVICE:

Exploitation boundaries in relation to existing management plan: Following the agreed and evaluated EU management plan a reduction of 10% of the 2009 F of 0.82 results in an F in 2010 of 0.74, which implies landings of 17700 t in 2010. This result in an increase of landings by 8.6% compared to the TAC in 2009. This is expected to lead to an increase of 15 % in SSB from 2010 to 2011 (20100 t.).

***Exploitation boundaries in relation to high long-term yield, low risk of depletion of production potential and considering ecosystem effects*:** ICES has previously recommended target fishing mortalities of 0.3 - 0.6 which would result in a low risk to reproduction and high long-term yields. This would correspond to landings of 8,600-15,000 t in 2010.

***Exploitation boundaries in relation to precautionary limits*:** Landings below 13300 t in 2010 would be expected to increase SSB to above Bpa in 2011.

***Conclusions on exploitation boundaries*:** ICES advises on the basis of the management plan that TAC should be increased by 8.6 % to 17,700 t in 2010.

STECF COMMENTS: STECF agrees with the advice from ICES and notes that in accordance with the multi-annual management plan landings in 2010 should be 17,700 t. This figure is calculated on the basis of a 10 % reduction in F.

STECF notes that ICES has evaluated the multi-annual management plan and considers it in accordance with the precautionary approach.

2.3. Cod (*Gadus morhua*) in the Baltic Sea (Subdivisions 25-32)

FISHERIES: Cod in Subdivisions 25-32 is exploited predominantly by Poland, Sweden, and Denmark, the remaining catches taken by Latvia, Lithuania, Russia, Germany, Finland, and Estonia. Cod is taken primarily by trawlers and gillnetters. The use of gillnets started in the 1990s and peaked shortly thereafter; at present this fishing method contributes about 30% to the total catch.

The reported landings for the years 1992–1995 are known to be incorrect due to incomplete reporting and these landings have therefore been estimated. Unreported and misreported catches from 1993 - 1996 were between about 7% and 38% of reported landings.

Estimates are available for misreporting since 2000 from a range of industry and enforcement sources. These indicate that catches in 2000 to 2007 have been around 32 - 45% higher than the reported figures. In 2008 unreported landings are estimated to 7 % of reported landings. Landings have fluctuated between 42,000 t and 392,000 t (1965 - 2008). In 2008 the landings including unreported landings amounted to 42,000 t.

Discards are estimated to be 8 % in weight and 18 % in numbers in 2008.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial and survey data.

REFERENCE POINTS: The precautionary reference points for fishing mortality proposed by ICES are F_{pa} = 0.6 and F_{lim} = 0.96. Integrated ecosystem assessment carried out by ICES has

demonstrated a major shift in food web composition and ICES considers that the precautionary biomass reference points (B_{pa} = 240,000 t and B_{lim} = 160,000 t) so far recommended for the Eastern Baltic cod stock are not considered applicable any more. No new biomass reference points have been proposed by ICES. The fishing mortality reference points were not rejected as they have been shown to be much less affected by the observed regime shift.

MANAGEMENT AGREEMENT: The EC has agreed on a management plan for cod in the Baltic Sea in September 2007. For Eastern Baltic cod the aim is to reach a fishing mortality rate no lower than 0.3. This should be reached by fixing the TAC consistent with an annual reduction in F by 10% and by annually reducing the total number of days a vessel can fish in the area by 10 % until the target F of 0.3 has been reached. The plan sets a maximum change of 15% of the TAC between consecutive years, unless the fishing mortality is estimated to be higher than 1.

In addition to the rules for setting the TAC and fishing effort the plan includes a number of control provisions and only two types of trawls (BACOMA with 110 mm square mesh panel and T90) are allowed in the cod trawl fishery.

For 2009 the TAC was increased by 15% following almost 40% increase in stock size in 2008 comparing to 2007.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	**Fishing mortality in relation to precautionary limits**	**Fishing mortality in relation to high long term yield**	**Fishing mortality in relation to agreed target reference points**	**Comment**
Undefined	Harvested sustainable	Appropriate	Below target	EU Management plan implemented in 2008 with target fishing mortality of 0.3

In the absence of applicable biomass reference points, the state of the stock cannot be evaluated with regards to these. SSB (2009) is estimated to be around 15% below the long-term average (1966–2008). Marked increase in spawning-stock biomass has been observed since 2007. Based on the most recent estimates of fishing mortality (for 2008) ICES classifies the stock as being harvested sustainable and below the agreed target. The 2003, 2005, and 2006 year classes are above the average of the past 15 years.

RECENT MANAGEMENT ADVICE:

For this advice, ICES defines “F” as the total fishing mortality including discards and unallocated landings, and “landings” to comprise all landings, whether they are legal or illegal, but excluding predicted discards.

The catch options provided by ICES for 2010 is assuming status quo fishing mortality in 2009. This gives estimated landings of 61,700 t and discards of 3,300 t. The TAC for 2009 is 49,380 t (Community quota of 44,580 t plus Russian quota of 4,800 t). ICES therefore in the catch forecast assumes unreported landings of 12,300 t corresponding to 25% of the TAC. Unreported landings is in 2008 estimated to 7% of the reported landings.

Exploitation boundaries in relation to existing management plans:

The estimated F in 2008 is 0.24, which is below the target fishing mortality of 0.3 in the EU management plan. Under status quo F of 0.24 the landings in 2010 would be 80,700 t. (and 2,300 t of discards) and biomass in 2011 would increase to almost 380,000 tons.

The management plan limits the deviation of the TACs between consecutive years to a 15% increase of the total TAC, which would result in a TAC of 56,800 t for 2010. Landings of 56,800 t in 2010 are expected to be associated with discards of 1,600 t. This catch corresponds to F = 0.16 for 2010.

Exploitation boundaries in relation to high long-term yield, low risk of depletion of production potential and considering ecosystem effects: ICES has previously recommended a target fishing mortality of 0.3, which would result in a low risk to reproduction and high long-term yields. Such a fishing mortality corresponds to landings of 98,000 t.

Exploitation boundaries in relation to precautionary limits: Fishing at F_{pa} in 2010 corresponds to landings of 181,000 t.

Conclusion on exploitation boundaries: The management plan has been evaluated by ICES as consistent with precautionary approach. ICES therefore advises on the basis of management plan. This approach corresponds to a TAC of 56,800 t in 2010.

STECF COMMENTS: STECF agrees with ICES advice.

STECF notes that ICES has evaluated that the multi-annual management plan adopted in 2007 is in accordance with the precautionary approach. Target fishing mortalities (including all catches) close to 0.3 (ages 4-7) would result in a low risk to reproduction and high long-term yields. The management plan is only in accordance with the precautionary approach if effectively implemented and enforced. The situation in former years with significant amounts of non-reported cod landings indicates that overall, enforcement was not effective. However, the enforcement improved markedly in 2008, resulting in decrease of underreported catches from previously estimated at over 30% of reported values to 7%.

STECF notes that the TAC advice provided by ICES for 2010 is assuming status quo fishing mortality in 2009. This gives estimated landings of 61,700 t and discards of 3,300 t in 2009. The TAC for 2009 is 49,380 t (Community quota of 44,580 t plus Russian quota of 4,800 t). ICES therefore in the catch forecast implicit assumes unreported landings of 12,300 t in 2009 corresponding to 25% of the TAC.

There is no indication of major change in the level of unreporting from 2008 to 2009 and STECF considers that the forecast provided by ICES for 2009 overestimates the likely catches. STECF considers that it is more likely that the level of unreporting in 2009 will be the same as in 2008. This corresponds to total landings in 2009 of 52,800 t (TAC of 49,300 t plus 7% unreported) and discards of 2,800 t.

STECF has recalculated the catch forecast for 2010 on the basis of: Landings (2009) = 52,8kt; discards (2009) = 2,8kt; F(2009) = 0.20; SSB(2010) = 334.1kt. The table below gives three options for 2010: A: total landings in 2010 equal to the TAC for 2009 plus 15% (management plan); B: a status quo fishing mortality in 2010 (F(2010) = F(2009)); C: F(2010) = 0.3.

Option	Landings (2010) in kt	Basis	Total F (2010)	F landings (2010)	F discards (2010)	Discards (2010) in kt	Total catch (2010) in kt	SSB (2011) in kt	% SSB change	% TAC change
A	56.8	15 % TAC	0.16	0.16	0.002	1.6	58.4	417	25%	15%

		deviation								
B	61	F(2010) = F(2009)	0.20	0.20	0.002	2.0	63.0	403	21%	24%
C	98	F(2010 = 0.3	0.3	0.3	0.003	2.9	100.5	369	10%	98%

STECF notes that the TAC of 56,800 t for 2010 set in accordance with the multi-annual management plan will, because of the constraint on annual variation in TAC, result in a fishing mortality of 0.16 which is well below the target F of 0.3 and is equivalent to a reduction in F of 20% compared to 2009.

STECF notes that the objective of the multi-annual management plan to reduce the fishing mortality to level associated with high long-term yield (F close to 0.3) has been fulfilled and fishing mortality is estimated to be well below the target. STECF notes that a TAC of 98,000 t for 2010 based on a target fishing mortality of 0.3 is consistent with the objective of the multi-annual management plan.

According to article 8(5) of the multi-annual management plan (Council Regulation (EC) No 1098/2007) the fishing effort in 2010 shall be equal to the fishing effort in 2009 multiplied by the target fishing mortality and divided by the fishing mortality in 2009 (Effort(2010) = Effort(2009) x 0.3 / F(2009)). With F (2009) equal to 0.2 the effort in 2010 should be increased by 50% compared to 2009. Assuming a 1:1 ratio between fishing effort and fishing mortality and no catch restrictions an effort increase of 50% would result in a fishing mortality of 0.3 in 2010.

This illustrate that there is a discrepancy between the allowed fishing effort and the effort required to take the TAC resulting from the management plan. To ensure consistency between the fishing effort and the TAC the fishing effort should be regulated so that it match the fishing mortality associated with the agreed TAC. This means that if the TAC for 2010 is fixed at 56,800 t the fishing effort should be reduced by 20% which is equal to the required reduction in fishing mortality.

To ensure that the discrepancy between fishing effort and fishing mortality does not result in increased discarding or unreported landings, it is important that the fisheries catching cod in 2010 be regulated in such a way that all catches of cod do not exceed the TAC plus expected discards.

STECF underlines that the above considerations regarding fishing effort and fishing mortality is based on the assumption of a 1 to 1 ratio between fishing effort and fishing mortality. STECF does not have information available to quantify the relationship between fishing effort and fishing mortality. However, the CPUE data for Danish trawlers used by ICES in the assessment indicates that this is not the case and that the necessary reduction in fishing effort would be lower than the reduction in fishing mortality.

2.4. Dab (*Limanda limanda)* in the Baltic Sea (Subdivisions 22-32)

FISHERIES: The total landings of dab have declined from1,894 t in 2004 to 697 t in 2008. During the years 1994 to 1996 the total landings of dab were over-reported due to by-catch misreporting in cod fishery. The highest landings are observed in Subdivision 22. The main dab landings are reported by Denmark (Subdivision 22 and 24) and Germany (mainly in Subdivision 22).

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: There are no precautionary reference points proposed for dab in the Baltic.

STOCK STATUS: The stock status is unknown. The only information available for this stock is landing statistics.

MANAGEMENT OBJECTIVES

No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: The available data are insufficient for assessing the current stock size and exploitation, and ICES gives no management advice on the dab stock in the Baltic.

STECF COMMENTS: STECF has no comments.

2.5. Flounder (*Platichthys flesus*) – IIIbcd (EU zone), Baltic Sea

FISHERIES: All countries surrounding the Baltic Sea report landings of flounder. It is mainly taken as by-catch in fisheries for cod, but there are also fisheries targeting this species. Since 1973 total recorded landings have fluctuated between 10-20 thousand t. During the mid-1990s flounder landings were misreported (over-reported) from the cod trawl fishery, mainly for Subdivisions 24 and 25. In 2008 the reported landings reached record high level of 23,889 t, of which 18,000 t is reported for subdivisions 24 and 25.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No assessment of the state of the stock is presented by ICES.

PRECAUTIONARY REFERENCE POINTS: No precautionary reference points have been proposed for the flounder stocks in the Baltic.

STOCK STATUS: Baltic flounder is composed of several sub-stocks but the information is insufficient to define stock boundaries in the area. The most recent ICES advice states that the size of most of the stocks is unknown. An exploratory analytical assessment was undertaken in 2005 for the flounder stock in Subdivisions 24 and 25. The results indicated a stable spawning stock in the entire period of the assessment (since 1978). There were indications of above average recruitment in recent years, fishing mortality has increased slightly over this period, and landings have increased since the late 90s. However, the assessment was rejected by ICES and remained exploratory.

RECENT MANAGEMENT ADVICE: There are no explicit management objectives for this stock. Data are insufficient for management advice and no advice is available from ICES.

STECF COMMENTS: STECF considers it unlikely that the assessment of the flounder stocks is improved significantly unless the Baltic fisheries research institutes give higher priority to flounder work and international cooperation on enhancing the quality of basic data is established.

2.6. Herring (*Clupea harengus*) in Divisions IIIbcd, Baltic Sea

The present ICES stock assessment units of Baltic herring and the existing management units are shown in the text table below:

Herring Stock Unit	Existing Management Area
Herring in IIIa and Sub-divisions 22-24	Sub-divisions 22 – 24 IIIa
Sub-divisions 25 to 29 and 32	Sub-divisions 25,26,27,29, 32 and 28.2 (excl. Gulf of Riga)
Gulf of Riga Herring (sub-division 28)	Sub-division 28.1 (Gulf of Riga)
Herring in Sub- division 30	Sub-divisions 30-31

2.6.1. Herring (Clupea harengus) in Subdivisions 25-29 (excluding Gulf of Riga) and 32.

FISHERIES: All the countries surrounding the Baltic, exploit the herring in these areas as part of fishery mixed with sprat. Over the last 30 years, landings of herring have decreased from a peak of 369,000 t in 1974 to 91,300 t in 2005. Since then landings have gradually increased to 126,155 t in 2008.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on catch data and on an international acoustic survey. Natural mortality is derived from a multispecies model from 2006 rescaled to the most recent estimates of cod biomass. Recruitment estimates for forecasts are based on the acoustic survey. Catches of central Baltic spring-spawning herring taken in the Gulf of Riga are included in the assessment.

REFERENCE POINTS: The proposed precautionary reference point for fishing mortality is F_{pa} = 0.19. ICES indicates that F_{pa} needs revision but does not propose a revised value. There is no biological basis at present for determining biomass reference points. A candidate for reference point which is consistent with a high long term yields and low risk of depleting the productive potential of the stock is F_y=0.22.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to high long term yield	Fishing mortality in relation to agreed target reference points	Comment
Undefined	Increased risk	Overexploited	N/A	

In the absence of defined biomass reference points the state of the stock cannot be evaluated with regard to these. The SSB has decreased steadily between the mid-1970s and the beginning of the century and increased since, but was rather stable in the last three years. The SSB estimate for 2009 is 557, 000 t., 39 % below the long-term average. Based on the most recent estimates of fishing mortality, the stock is classified at risk to be harvested unsustainably. F has been slightly above F_{pa} in recent years and is now at the level of F=0.25.

RECENT MANAGEMENT ADVICE:

Exploitation boundaries in relation to high long term yield, low risk of depletion of production potential and considering ecosystem effects:
The current fishing mortality, estimated at 0.25, is above the candidate F_y=0.22.

Exploitation boundaries in relation to precautionary limits: The fishing mortality in 2010 should be below F_{pa} = 0.19, corresponding to landings of less than 103,000 t.

STECF COMMENTS: STECF agrees with the ICES advice. STECF, however, notes that the basis for ICES advice is the Fpa, which ICES has indicated needs to be revised. STECF furthermore notes that the advice provided by ICES is referring to the stock and not to management area. Therefore in the herring TAC for the Sub-divisions 25-27, 28.2, 29&32 the average catches of this stock in Sub-division 28.1 should be excluded and the average catches of Gulf of Riga herring taken outside the Gulf of Riga in Sd 28.2 should be included. This would correspond to a TAC of 100,000 t in 2010 (Table 1).

STECF notes that using the TAC rules proposed by the Commission (COM(2009) 224) would result in a TAC for 2010 of 122,060 t (category 2 stock, 15 % reduction in TAC).

2.6.2. Herring (Clupea harengus) in the Gulf of Riga.

FISHERIES: Herring catches in the Gulf of Riga include both Gulf herring and open-sea herring, which enter the Gulf of Riga from April to June for spawning. In the past 25 years landings have fluctuated between 15,000 and 40,000 t. The herring in the Gulf of Riga is fished by Estonia and Latvia. The structure of the fishery has remained unchanged in recent decades. Approximately 70% of the catches are taken by the trawl fishery and 30% by a trap net fishery on the spawning grounds. Landings in 2008 were 37,100 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: The proposed precautionary reference point for F (F_{pa}) is set at 0.40; F_{lim} is not defined. An integrated ecosystem assessment shows a major shift in food web composition and in environmental drivers, and therefore the biomass reference points used in previous assessments were not considered applicable anymore. Candidates for reference points which are consistent with a high long-term yields and low risk of depleting the productive potential of the stock are in the range of $F_{0.1}$-F=0.35.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to high long term yield	Fishing mortality in relation to agreed target reference points	Comment
Undefined	Harvested sustainably	Overexploited	N/A	

In the absence of applicable biomass reference points, the state of the stock cannot be evaluated with regard to these. Following high recruitment, SSB increased in the late-1980s and has been around 18% above the long-term average. Based on the most recent estimates of fishing mortality, ICES classifies the stock as being harvested sustainably. The fishing mortality has been below F_{pa} in the last year. The year classes of 2005, 2007 and 2008 are strong, while the year class of 2006 is poor.

RECENT MANAGEMENT ADVICE:

Exploitation boundaries in relation to high long term yield, low risk of depletion of production potential and considering ecosystem effects:
The current fishing mortality, estimated at 0.38, is above the candidate F which will lead to high long-term yields and low risk of depletion.

Exploitation boundaries in relation to precautionary limits

The fishing mortality in 2010 should be below F_{pa} (= 0.4), corresponding to landings of less than 33,400 t.

STECF COMMENTS: STECF agrees with the ICES advice. STEFC, however, notes that this advice is referring to the stock and not to management area. Therefore in the TAC for the Gulf of Riga (Sd 28.1) average catches of open sea herring should be included and the average catches of Gulf of Riga herring taken outside the Gulf of Riga should be excluded. The ICES advice therefore corresponds to a TAC of 36,400 t in 2010 (Table 1).

Table 1. Setting of herring TACs by management area in Sub-divisions 25-27, 28.2, 29&32 and in Sub-division 28.1.

Stock	Stock advice	Average 5 year catch taken outside management area	Average 5 year catch of another stock taken in the management area	Management area advice
Sd 25-27, 28.2, 29&32	103,000	3,300	300	100,000
Sd 28.1	33,400	300	3,300	36,400

2.6.3. Herring (Clupea harengus) in Subdivision 30, Bothnian Sea

FISHERIES: Finland and Sweden carry out herring fishery in this area, mainly with pelagic trawls. On average 90% of the total catch is taken by trawl fishery. The trap-net fishery is of minor importance. In the trawl fishery more effective and larger trawls have been introduced in the 1990s. Landings were relative stable around 20 to 30,000 t until 1992, after which they increased to between 50 and 60,000 t. A further increase in landings has taken place in 2006 and 2007 and reached a record high level of 75,400 t in 2007. In 2008 the landings were 65,400 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: An integrated ecosystem assessment shows a major shift in food web composition and in environmental drivers, and therefore the biomass reference points used in previous assessments were not considered applicable anymore. The proposed precautionary reference point for F (F_{pa}) is set at 0.21 while F_{lim} is considered to be 0.3. Candidates for reference points which are consistent with a high long-term yields and low risk of depleting the productive potential of the stock are in the range of $F_{0.1}$ to F_{pa}.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	**Fishing mortality in relation to precautionary limits**	**Fishing mortality in relation to high long term yield**	**Fishing mortality in relation to agreed target reference points**	**Comment**
Undefined	Harvested sustainably	Appropriate	NA	

In the absence of applicable biomass reference points, the state of the stock cannot be evaluated with regard to these. Following high recruitment, SSB tripled in biomass in the late-1980s and has remained high since. Based on the most recent estimates of fishing mortality, ICES classifies the stock as being harvested sustainably. The fishing mortality has been below F_{pa} since the beginning of time series, fluctuating between 0.1 and 0.2.

RECENT MANAGEMENT ADVICE:

The fishing mortality in 2010 should be below F_{pa} (= 0.21), corresponding to landings of less than 109,600 t.

STECF COMMENTS: STECF agrees with the ICES advice.

The TAC covers Subdivisions 30 and 31 and should be set in accordance with the advice given for the herring stocks in 30 and in 31. STECF advises that the catch in Subdivision 31 should be below the level observed in most recent years (see section …). This gives a combined TAC advice for Subdivision 30 and 31 of 112,000 t for 2010.

Using the TAC rules proposed by the Commission (COM(2009) 224) for setting TAC for stock exploited at the maximum sustainable yield rate the TAC should not be increased by more than 25% that would correspond to catches of 103,400 t in 2010.

2.6.4. Herring (Clupea harengus) in Sub-div. 31, Bothnian Bay (Management Unit 3)

FISHERIES: Trawl fisheries account for the main part of the total catches. Normally the trawl fishing season begins in late April and ends before the spawning season in late May to July. It resumes in August/September and continues, until the ice cover appears, usually in early November. The catch in 2008 was about 2,500 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: Precautionary Approach reference points are not defined.

STOCK STATUS: The available information is inadequate to evaluate stock trends. Therefore the state of the stock is unknown and there is no basis for an advice.

RECENT MANAGEMENT ADVICE: The only new information that is available for herring in Subdivision 31 is landings data. The advice for 2010 is not provided by ICES.

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STECF COMMENTS: STECF notes that recent average catches 2002-2008 have been below the long-term mean and in 2008 decreased to 2,500 t. In recent years the fishery has been largely supported by the 2002 year-class. Given that these observations indicate that the stock may be reduced compared to its long-term status, and that the exploitation rate is unknown, STECF advises that the catch should be kept below the level observed in most recent years.

2.7. Plaice (*Pleuronectes platessa*) in the Baltic Sea (Subdivisions 22-32)

FISHERIES: The highest total landings of plaice were observed at the end of the seventies (8,289 t in 1979) and the lowest in 1989 (403 t). Since 1995 the landings increased again and reached a moderate temporal maximum in 2002 (2,763 t). After then the landings decreased to 1,350 t in 2008. The fluctuations are supposed to be caused mainly by immigration of plaice from the Kattegat into the western Baltic Sea. ICES Subdivision 22 is the main fishing area, and Denmark is the main fishing country. Subdivision 25 is on the second place. Poland and Denmark are the main fishing countries there.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: There are no precautionary reference points proposed for plaice in the Baltic.

STOCK STATUS: The stock status is unknown. The only information available for this stock is landing statistics.

MANAGEMENT OBJECTIVES

No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: The available data are insufficient for assessing the current stock size and exploitation, and ICES gives no management advice on the Plaice stocks in the Baltic.

STECF COMMENTS: The available information is insufficient for STECF to provide a management advice for the plaice in the Baltic Sea.

2.8. Salmon (*Salmo salar*) in the Baltic Sea, Div. IIIb,c,d (Main Basin and Gulf of Bothnia, Sub-div. 22-31)

FISHERIES:

The total catch in the Baltic Sea (including rivers) has declined over 80 % since 1990, from 5636 (1990) to 1011 t (2008). The decline has been largest in the offshore fishery where landings in 2008 were 200 t or only 5 % of landings reported in 1990. Landings from coastal fisheries have declined by almost 70 % to 440 t in 2008, while river catches have shown no clear trend with reported landings in 2008 of 260 t. 35% of the EC quota for 2008 was landed.

Non-reported catches and discards are estimated to be about 27% of the total catches in 2008.

The decreased catches are largely explained by quota and national restrictions, reduced post smolt survival and declining effort mainly in the offshore fishery caused by a drift net ban since Jan 2008 but also by poor market prices and market restrictions related to high dioxin contents. The nominal catch in the offshore fishery decreased by 63% from 2007 to 2008.

There has been an increase in the proportion of wild salmon in catches, relative to reared salmon, which reflects the increased wild smolt production. The share of non-commercial (recreational) catches has increased and will likely increase further.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: To evaluate the state of the stock ICES uses the smolt production relative to the 50% and 75% level of the natural production capacity on a river-by-river basis. Potential smolt production capacity estimates for the individual rivers were updated in this year's assessment.

MANAGEMENT AGREEMENTS: In 1997 IBSFC adopted the Salmon Action Plan (SAP) running 1997–2010 where the long-term objectives are:

1. To prevent the extinction of wild populations, further decrease of naturally produced smolts should not be allowed.
2. The production of wild salmon should gradually increase to attain by 2010 for each salmon river a natural production of wild Baltic salmon of at least 50% of the best estimate potential and within safe genetic limits, in order to achieve a better balance between wild and reared salmon.
3. Wild salmon populations shall be re-established in potential salmon rivers.
4. The level of fishing should be maintained as high as possible. Only restrictions necessary to achieve the first three objectives should be implemented.
5. Reared smolts and earlier salmon life stage releases shall be closely monitored.

No update of objectives has been set by the EU Commission replacing the IBSFC Salmon Action Plan (SAP).

STOCK STATUS: In order to better support the management of wild salmon stocks, ICES has established five assessment units for the Baltic Main Basin and the Gulf of Bothnia.

Assessment unit	Name	Salmon rivers included
1	Northeastern Bothnian Bay stocks	On the Finnish-Swedish coast from Perhonjoki northward to the river Råneälven, including River Tornionjoki
2	Western Bothnian Bay stocks	On the Swedish coast between Lögdeälven and Luleälven
3	Bothnian Sea stocks	On the Swedish coast from Dalälven northward to Gideälven and on the Finnish coast from Paimionjoki northwards to Kyrönjoki
4	Western Main Basin stocks	Rivers on the Swedish coast in Divisions 25–29
5	Eastern Main Basin stocks	Estonian, Latvian, Lithuanian, and Polish rivers

The overall estimated smolt production has been increasing and will continue to stay high in the near future.The total wild smolt production has increased about tenfold in assessment units 1–2 since the Salmon Action Plan was adopted in 1997. Wild smolt production is now estimated to be 70-75 % of the potential total smolt production. However smolt production is still low in rivers where salmon were extirpated and are now being reintroduced.

Due to the ban on the driftnet fishery as of January 2008, the salmon catches in 2008 were lower than in 2007. This resulted in an increased number of spawners during the 2008. The post-smolt survival was low in 2004-2006, but increased again in 2007, which is predicted to further aid the recovery of spawning populations in the short term

From the 27 rivers assessed by ICES, 18 are likely or very likely to reach the 50% target in 2010. Five rivers are unlikely to reach that target. The target is more likely to be met in productive rivers especially in the Northern Baltic Sea area while the status of less productive wild stocks in other areas remains poor.

RECENT MANAGEMENT ADVICE: In order to ensure recovery of the salmon stocks ICES recommends for 2010 a TAC of not more than 133 000 salmon. This reflects the predicted catch of these fisheries in the low exploitation scenario, which is very similar to a *status quo* (2008) effort.

Salmon management should be based on the assessments of the status of individual stocks in the rivers. Fisheries on mixed stocks, either in coastal waters or open sea areas, pose particular difficulties for management. These fisheries cannot target only those stocks that are close to or above their targets when they exploit stocks which are above and below reference points. Fisheries in estuaries and rivers are more likely to fulfil this requirement.

The rivers Emån, Pärnu, Nemunas basin, Rickleån, Öreälven are especially weak and they need longer-term stock rebuilding measures, including fisheries restrictions, habitat restoration and removal of physical barriers. In order to maximise the potential recovery of these stocks from these measures, it is recommeded that further decreases in exploitation are required along their spawning migration routes. A high degree of mixing is likely as salmon of the rivers Rickleån and Öreälven pass the Åland Sea and Bothnian Sea on their spawning migration. Salmon spawners of the river

Pärnu pass the coastal waters of the Gulf of Riga. Salmon of the river Emån pass the coastal waters around the Öland Island, and salmon of the Nemunas basin pass the coastal waters around the Curonian lagoon on their spawning migration.

STECF COMMENTS:

ICES recommends that the TAC for 2010 should be set to no more than 133 000 salmon. With a TAC of 133 000 salmon, predicted total catch (reported and unreported commercial catch + recreational catch), would be 200 000 salmon. STECF notes that under this low effort scenario smolt production is predicted to continue the increasing trend in most of the rivers.

The overall estimated smolt production has been increasing and will continue to stay high in the near future and the number of spawners are estimated to increase slightly in the short term. However, the status of the less productive wild stocks is poor and it is uncertain if they will reach the 50 % of the potential smolt production level.

STECF notes that applying the TAC rules proposed by the Commission (COM(2009) 224) would result in a TAC for 2010 of 263 500 specimens. (*category 6, 15 % decrease*)

STECF underlines the need to establish new operational aims for the Baltic salmon stocks for the future management. STECF notes that since the dissolution of the IBSFC the salmon action plan has not been replaced and there is currently no formal management plan for salmon in this area.

2.9. Salmon (*Salmo salar*) in the Baltic Sea, Gulf of Finland (Sub-div. 32)

FISHERIES: The salmon fishery in the Gulf of Finland is mainly based on reared fish. Estonia, Finland and Russia are participating in the salmon fishery. Salmon catches in the area are low, and although commercial effort is low there is substantial (but poorly quantified) effort and catches by recreational fishers. In 1996 the landings amounted to about 80,000 specimens, but in 2008 the landings only amounted to 17,000 specimens or 109 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: Not established.

STOCK STATUS: **The new data available for this stock are too sparse to revise the advice from last year.**

MANAGEMENT AGREEMENTS: The objective of the Salmon Action Plan (SAP), as adopted by the former IBSFC, is to increase the natural production of wild Baltic salmon to at least 50% of the natural production capacity of each river by 2010, while retaining the catch level as high as possible. In addition, objectives state that the genetic diversity of the stocks should be maintained. The management objective concerned has expired in practice because catch options for 2007 mainly influence smolt year-classes beyond year 2010. No update of objectives has been set by the EU Commission after the former IBSFC Salmon Action Plan (SAP).

RECENT MANAGEMENT ADVICE: ICES recommends there should be no catch of wild Estonian salmon in 2010 in the Gulf of Finland.

Fisheries should only be permitted at sites where there is no chance of taking wild salmon from the Gulf of Finland stocks along with reared salmon. To improve selectivity of harvesting, coastal fisheries at sites likely to be on the migration paths of wild salmon from Estonian rivers should be prohibited. Poaching occurs in these rivers and must be stopped. Fishing in rivers and river mouths supporting wild stocks should be prevented.

This advice will not be updated until 2010 (for fishing in 2011) unless there is a significant change in the available data.

STECF COMMENTS: STECF agrees that there should be no catches of wild salmon in the Gulf of Finland.

2.10. Sea trout (*Salmo trutta*) in the Baltic Sea (Sub-div. 22-32)

FISHERIES: Most of the sea trout catches are taken as a by-catch in other fisheries. Off-shore migrating sea trout stocks are to a large extent taken as a by-catch in the salmon fishery, whereas those which migrate shorter distances are caught in fisheries targeting whitefish, pikeperch, and perch. Nominal sea trout landings have been decreasing since 2000, from 1452 t in 2000 to 558 t in 2008. Ban on driftnets (from Jan 2008) had a significant effect especially on Polish sea trout catches which were reduced from 525 t in 2007 to 172 t in 2008.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: Not established.

STOCK STATUS: The Baltic Sea contains approximately 1000 sea trout stocks. The status of these populations is very variable; a few populations appear to be in a good state, whereas many populations especially in the Gulf of Bothnia and Gulf of Finland appear to be weak.

MANAGEMENT AGREEMENTS: There are no management agreements or TAC set for the sea trout. Community and national regulations include inter alia minimum landing size, local and seasonal closures, and minimum mesh sizes for gillnet fishery.

RECENT MANAGEMENT ADVICE: ICES recommends immediate fishing restrictions to be enforced in the Gulf of Bothnia (ICES Subdivisions 30 and 31) and Gulf of Finland (ICES Subdivision 32), to safeguard the remaining wild sea trout populations in the region. Minimum mesh size for gillnets, and effort limitations should be implemented for the fisheries in the sea and in rivers carrying wild sea trout populations in order to decrease the exploitation rate.

Adequate fishing regulations should be enforced locally in ICES Subdivisions 29–32 to reduce the fishing mortality of sea trout: a minimum legal landing size of 65 cm would allow female fish to spawn at least once. Further, the problem of early catch of immature trout could be considerably reduced by prohibiting the use of mesh sizes below 50 mm (bar length). Gill net fishing should be totally prohibited or severely restricted both in rivers and at river mouths, where sea trout are found.

In the Main Basin, (ICES Subdivisions 22–29) habitat improvements by restoration are needed and accessibility to spawning and rearing areas should be improved in many rivers. Existing fishing restrictions (for example, closed season, closed areas at river mouths, minimum landing size and minimum mesh sizes) should be maintained in order to protect trout populations.

STECF COMMENTS: STECF agrees that local fishing restrictions are required to safeguard the wild sea trout populations. STECF is not in a position to evaluate if the measures proposed by the ICES are adequate to ensure sustainable fisheries of sea trout.

2.11. Sprat (*Sprattus sprattus*) in IIIbcd, Baltic Sea (Sub-div. 22-32)

FISHERIES: All countries surrounding the Baltic Sea report landings of sprat. During the 1990s total catches increased considerably, from a level of 86,000 t in the 1990 to 529,000 t in 1997. Since then there has been a decrease and landings have since 2000 been fluctuating around 375,000 t In 2008 total catches reached 381,000 t. Trawlers account for most of the catches. The increase in catches since 1992 is due to increased productivity in the stock and the development of a target pelagic fishery. Varying amounts of herring are taken as by-catch in the fisheries for sprat.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The age-structured assessment is based long-term catch data and three survey indices.

MANAGEMENT AGREEMENT: The IBSFC long-term management plan for the sprat stock was terminated in 2006. The present advice was given in relation to precautionary limits.

REFERENCE POINTS: The proposed precautionary reference point for F (F_{pa}) is set at 0.40; F_{lim} is not defined. An integrated ecosystem assessment shows a major shift in food web composition and in environmental drivers, and therefore the biomass reference points used in previous assessments were not considered applicable anymore. A candidate for reference point which is consistent with a high long term yields and low risk of depleting the productive potential of the stock is F_y=0.40.

STOCK STATUS:

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to high long term yield	Fishing mortality in relation to agreed target reference points	Comment
Undefined	At risk	Overexploited	N/A	

In the absence of applicable biomass reference points, the state of the stock cannot be evaluated with regard to these. SSB has declined from a historic high level in the late 1990s to around 20 % above the long term average in 2008. Based on the most recent estimate of fishing mortality of 0.52, ICES classifies the stock at the risk to be harvested unsustainably.

RECENT MANAGEMENT ADVICE:

Exploitation boundaries in relation to precautionary limits: Fishing mortality in 2010 should be below **Fpa** = 0.40, corresponding to landings of less than 306 000 t.

STECF COMMENTS: STECF agrees with the ICES advice on the exploitation of Baltic sprat.

STECF notes that applying the rule for setting TAC proposed by the Commission (COM(2009) 224) the variation in the TAC should be limited to +/- 15 % and would result in a TAC of 339,150 t for 2010.

STECF notes that the last assessment shows similar estimates of SSB and fishing mortality as the 2008 assessment. The estimate of SSB in 2007 has been revised downwards by 9% and the F in 2007 has been revised upwards by 4%.

2.12. Turbot (*Psetta maxima)* in the Baltic Sea (Subdivisions 22-32)

FISHERIES: Turbot occurs mainly in the southern and western parts of the Baltic Proper. Therefore, most of the landings are reported for ICES Subdivisions 22-26. The total reported landings of turbot increased from 42 t to 1,210 t between 1965 and 1996. From that high level the landings decreased to about 500 t in the 2000s. The total landings in 2008 of about 280t mean an increase by about 80 t from 2007.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

PRECAUTIONARY REFERENCE POINTS: There are no precautionary reference points proposed for turbot in the Baltic.

STOCK STATUS: The stock status is unknown. The only information available for this stock is landing statistics.

MANAGEMENT OBJECTIVES

No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: The available data are insufficient for assessing the current stock size and exploitation, and ICES gives no management advice on the turbot stocks in the Baltic.

STECF COMMENTS: The low landings in recent years give rise to concern. However, it is not possible to judge if the decline in landings reflects a low stock level, a substantial reduction in fishing effort or a combination of the two.

European Commission

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Abstract
The STECF SGRST/ECA -09-01 met in Carlottenlund (Denmark) to review the scientific advice given by the ICES on Baltic Sea stocks and fisheries. The scientific advice on the stocks and fisheries in the Baltic Sea in 2010 was evaluated and endorsed by the Scientific, Technical and Economic Committee for Fisheries (STECF) by written procedure in June 2009 on request oif the European Commission.

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