



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

**REVIEW OF SCIENTIFIC ADVICE FOR 2011**

**ADVICE ON STOCKS IN THE BALTIC SEA**

**(SGRST- 10-01)**

June 2010, EVALUATED BY THE STECF BY WRITTEN  
PROCEDURE

Edited by Eskild Kirkegaard & Hendrik Doerner

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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 2010**

**Table of Contents**

1.	BACKGROUND .....	5
1.1.	Terms of reference .....	5
1.2.	Participants.....	6
2.	Introduction.....	7
2.1.	Format of the STECF Review of advice.....	7
2.2.	Changes in the ICES Advice in 2010 .....	7
3.	STECF Review of ICES Advice on Resources in the Baltic Sea.....	8
3.1.	Brill ( <i>Scophthalmus rhombus</i> ) in the Baltic Sea (Subdivisions 22-32).....	8
3.2.	Cod ( <i>Gadus morhua</i> ) in the Baltic Sea (Subdivisions 22-24) .....	8
3.3.	Cod ( <i>Gadus morhua</i> ) in the Baltic Sea (Subdivisions 25-32) .....	10
3.4.	Dab ( <i>Limanda limanda</i> ) in the Baltic Sea (Subdivisions 22-32).....	13
3.5.	Flounder ( <i>Platichthys flesus</i> ) – IIIbcd (EU zone), Baltic Sea.....	13
3.6.	Herring ( <i>Clupea harengus</i> ) in Divisions IIIbcd, Baltic Sea .....	13
3.6.1.	Herring ( <i>Clupea harengus</i> ) in Division IIIa and Subdivision 22 – 24.....	14
3.6.2.	Herring ( <i>Clupea harengus</i> ) in Subdivisions 25-29 (excluding Gulf of Riga) and 32. 14	
3.6.3.	Herring ( <i>Clupea harengus</i> ) in the Gulf of Riga. ....	15
3.6.4.	Herring ( <i>Clupea harengus</i> ) in Subdivision 30, Bothnian Sea.....	17
3.6.5.	Herring ( <i>Clupea harengus</i> ) in Subdivision. 31, .....	19
3.7.	Plaice ( <i>Pleuronectes platessa</i> ) in the Baltic Sea (Subdivisions 22-32).....	19
3.8.	Salmon ( <i>Salmo salar</i> ) in the Baltic Sea, Div. IIIb,c,d (Main Basin and Gulf of Bothnia, Sub-div. 22-31).....	20
3.9.	Salmon ( <i>Salmo salar</i> ) in the Baltic Sea, Gulf of Finland (Sub-div. 32).....	22
3.10.	Sea trout ( <i>Salmo trutta</i> ) in the Baltic Sea (Sub-div. 22-32).....	23

3.11.	Sprat ( <i>Sprattus sprattus</i> ) in IIIbcd, Baltic Sea (Sub-div. 22-32) .....	24
3.12.	Turbot ( <i>Psetta maxima</i> ) in the Baltic Sea (Subdivisions 22-32) .....	25
4.	Annex 1. Basis for ICES MSY advice.....	27

## 1. BACKGROUND

The STECF SGRST-10-01 met in Lyngby (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-10-01 meeting, evaluate the findings and make any appropriate comments and recommendations by written procedure.

### 1.1. Terms of reference

The STECF SGRST Working Group 10-01 is requested to review, comment, modify and complete, as far as needed, released scientific advice for the following Baltic Sea stocks in 2010 – 2011.

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(2010) on a consultation on fishing opportunities for 2011 (see documents supporting terms of reference).

#### Baltic Sea stocks

- Stocks of
  - Cod in subdivisions 22-24
  - Cod in subdivisions 25-32
  - 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 24, 2010.

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## 2. INTRODUCTION

This report represents the STECF review of advice for stocks of interest to the European Community in the Baltic Sea. The advice on herring in division IIIa and subdivisions 22 – 24 was not available at the time this report was drafted and will be included in Part 2 of the STECF review of advice on Stocks of Community interest which will be published in July 2010.

In undertaking the review, STECF has consulted the most recent reports on stock assessments and advice from ICES and has attempted to summarise them in a common format. The review was drafted by the STECF-SGRST 10-01 Working group during its meeting held in Lyngby, Denmark from 7-9 June 2010 and adopted by written procedure on 17 June 2010.

### 2.1. Format of the STECF Review of advice

For each stock, a summary of the following information is provided:

**STOCK:** [Species name, scientific name], [management area]

**FISHERIES:** fleets prosecuting the stock, management body in charge, economic importance in relation to other fisheries, historical development of the fishery, potential of the stock in relation to reference points or historical catches, current catch (EU fleets' total), any other pertinent information.

**SOURCE OF MANAGEMENT ADVICE:** reference to the management advisory body.

**MANAGEMENT AGREEMENT:** where these exist.

**REFERENCE POINTS:** where these have been proposed.

**STOCK STATUS:** Reference points, current stock status in relation to these. STECF has included precautionary reference point wherever these are available.

**RECENT MANAGEMENT ADVICE:** summary of advice.

**STECF COMMENTS:** Any comments STECF thinks worthy of mention, including errors, omissions or disagreement with assessments or advice.

### 2.2. Changes in the ICES Advice in 2010

STECF notes that ICES has changed the format of its advice in 2010. The advice for 2011 is given for three management approaches:

1. Transition to Maximum Sustainable Yield (MSY). The advice given for 2011 reflects a stepwise transition to the ICES MSY Harvest Control Rule by 2015 if an estimate or a proxy of  $F_{MSY}$  is available. A detailed description of the basis for ICES MSY advice is given in annex 1. In summary, the ICES advice is for a TAC consistent with a constant fishing mortality at  $F_{msy}$  (or proxy) provided that the spawning stock biomass is above a specified level (SSB-trigger).
2. Precautionary Approach.
3. Harvest control rules defined in agreed management plans.

In addition, ICES provides TAC options consistent with the following:

1.  $F_{MSY}$ ,
2. Precautionary Reference points
3. Rules for setting the TAC given in annex III of the Communication from the Commission COM(2010) on a consultation on fishing opportunities for 2011 (EC Policy paper).

### STECF Comments on the ICES approach to advice

STECF has reviewed ICES advice and where considered appropriate, has made additional comments on such advice. STECF supports the approach of ICES for providing advice on annual limitations in catching possibilities in the context of the frameworks of MSY, precautionary approach and agreed management plans and/or policies. STECF notes that in the absence of an estimate of FMSY, the basis for many of the FMSY-proxy values used by ICES is not clear. As a general rule, STECF considers that in the absence of a reliable estimate of FMSY, the appropriate proxy for FMSY is F0.1, unless there are sound, objective reasons to choose an alternative value. STECF recognises that for some stocks, F0.1 may not be the most appropriate FMSY proxy and that ICES will have considered all the available information available to make such a judgement, even though the rationale for choosing an alternative is not documented in its advisory report. Hence in this report, STECF only makes specific comments on FMSY(or proxy) values used by ICES where there are sound, objective reasons to do so..

In addition to summarising the ICES advice in this report, and in accordance with the Commission's request to STECF, this report provides advice on TACs for 2011 consistent with the rules laid down in ANNEXES III and IV of the Communication from the Commission on a consultation on fishing opportunities for 2011 COM(2010) 241-FINAL. STECF wishes to stress that the advised TACs constitute a direct application of the rules laid down in ANNEXES III and IV of COM(2010) 241-FINAL and should not be interpreted as STECF recommendations for fishing opportunities for 2011.

### **3. STECF REVIEW OF ICES ADVICE ON RESOURCES IN THE BALTIC SEA**

#### **3.1. 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.

**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 AGREEMENT:** 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 notes that with reference to the EC Policy paper this stock is classified under category 11. STECF furthermore notes that no TAC is set for this stock.

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

**FISHERIES:** Cod in the Western Baltic (Subdivisions 22-24) is exploited predominantly by Denmark and Germany, with smaller catches taken by Sweden and Poland. The fishery is conducted by trawl (70% of the landings) and gillnets (30%). Landings fluctuated between 40,000 and 54,000 t from 1965 to 1985, falling in the late 1980s and reaching 17,000 t in 1991. Landings increased until 1995 where they reached 51,000 t. After 1995 landings have declined again, have in recent years been between 15,000 and 24,000 t with the lowest value of the time series in 2009.

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 recent years 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 2009 to 6 % of the total catch in weight and 13 % when measured in numbers. The majority of the discards are undersized cod and there is no indication of high grading. It is possible that the discards of undersized Western Baltic cod will increase in 2010 when the stronger 2008 year class enters the fishery.

**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) is used since last year's assessment. The model provides statistically sound estimates of uncertainties in the results.

**REFERENCE POINTS:** The precautionary reference point for spawning biomass  $B_{pa}$  is 23,000 t. The basis for  $B_{pa}$  is MBAL (minimum biological acceptable level of SSB). ICES proposes this reference point also as Biomass trigger point in the MSY framework.  $B_{lim}$ ,  $F_{pa}$  and  $F_{lim}$  are not defined ICES used 0.24 as  $F_{msy}$  reference point. This point is derived from  $F_{max}$  from the 2010 assessment.  $F_{max}$  is well 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 (since January 2010: BACOMA with 120 mm square mesh panel and T90 with 120 mm mesh) are allowed in the cod trawl fishery. Highgrading is prohibited in all Baltic fisheries since January 2010.

ICES evaluated the long-term plan in 2009 and considered it to be in accordance with the precautionary approach.

**STOCK STATUS:**

		SSB (Spawning Stock Biomass)		
		2008	2009	2010
MSY ( $B_{trigger}$ )		⊖	⊕	⊕ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )		⊕	⊕	⊕ Full reproductive capacity
		F (Fishing Mortality)		
		2007	2008	2009
MSY ( $F_{MSY}$ )		⊖	⊖	⊖ Overfishing
Precautionary approach ( $F_{pa}, F_{lim}$ )		?	?	?

SSB has in recent years been fluctuating around  $B_{pa}$ .  $F$  has been decreasing since the late 1990s to around 0.7 in recent years. The 2 latest year classes have been close to the average of the last 10 years, while year classes 2004 – 2007 were weak.

**RECENT MANAGEMENT ADVICE:**



Management Objective (s)	Landings in 2011
Transition to an MSY approach with caution at low stock size	Less than 18.2 kt
Cautiously avoid impaired recruitment (Precautionary Approach)	n/a
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	Less than 18.8 kt

**MSY approach:** Following the ICES MSY framework implies fishing mortality to be reduced to 0.24, resulting in landings of 8.1 kt in 2011. This is expected to lead to an SSB of 38.2 kt in 2012. Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.63, resulting in landings of 18.2 kt in 2011. This is expected to lead to an SSB of 29.0 kt in 2012.

**Precautionary approach:** As there is no F<sub>pa</sub> defined for this stock the catch corresponding to the PA approach cannot be calculated.

**Management plan:** Following the agreed EU management plan implies an F reduction of 10% which is expected to lead to a TAC of 18.8 kt and F at 0.65 in 2011.

**STECF COMMENTS:** STECF notes that in accordance with the multi-annual management plan landings in 2011 should be 18,800 t. This figure is calculated on the basis of a 10 % reduction in F.

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

**FISHERIES:** Cod in the Eastern Baltic (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. In this period, unreported and misreported catches were between about 7% and 38% of reported landings.

Estimates are available for underreporting 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. Since 2008 unreported landings have been reduced to less than 7 % of reported landings. Landings have fluctuated between 42,000 t and 392,000 t over the whole time series, starting in 1965. In 2009 the landings including estimates of unreported landings amounted to 48,400 t.

Discards are estimated to be 6.5 % in weight and 15 % in numbers in 2009. There are in some fisheries indications of highgrading currently not included in the discard estimates.

**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<sub>pa</sub> = 0.6 and F<sub>lim</sub> = 0.96. Integrated ecosystem assessments carried out by ICES have demonstrated a major shift in food web composition in mid-1990ies and ICES considers that the precautionary biomass reference points ( B<sub>pa</sub> = 240,000 t and B<sub>lim</sub> = 160,000 t) recommended earlier 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. ICES has used an F<sub>msy</sub> reference point this year which is at 0.3 (close to F<sub>max</sub>, based on stochastic simulations) and equals the F<sub>target</sub> of the long-term plan. No MSY trigger biomass could be identified.

**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 (since March 2010: BACOMA with 120 mm square mesh panel and T90 with 120 mm mesh) are allowed in the cod trawl fishery. Highgrading is prohibited in all Baltic fisheries since January 2010.

For 2010 the TAC was increased by 15% following almost 70% increase in stock size in 2009 comparing to 2008.

**STOCK STATUS:**

		SSB (Spawning Stock Biomass)		
		2008	2009	2010
<b>MSY</b> ( $B_{trigger}$ )		?	?	?
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )		?	?	?
		F (Fishing Mortality)		
		2007	2008	2009
<b>MSY</b> ( $F_{MSY}$ )		-	+	+
<b>Precautionary approach</b> ( $F_{pa}, F_{lim}$ )		+	+	+

In spite of the absence of applicable biomass reference points (BRPs), ICES considers the present SSB to be above any candidate for precautionary biomass reference points. The SSB increased rapidly in recent years to 294,000 t in 2010. F in 2009 was estimated to be low (F=0.23) for the second year in a row. The 2006 and 2007 year classes (at age 2) are the strongest year classes since 1987.

**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 are assuming a TAC constraint in 2010. This gives estimated landings of 56,100 t and discards of 3,900 t in 2010. The TAC for this year is 56,800 t (Community quota of 51,267 t plus Russian quota of 5,520 t). There are no unreported landings expected in this forecast.

Management Objective (s)	Landings in 2011
Transition to an <b>MSY approach</b> with caution at low stock size	Less than 105 kt
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	n/a
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	Less than 64 kt

**MSY approach: Following** the ICES MSY framework implies fishing mortality should be 0.30 resulting in landings of 105 kt in 2011. This is expected to lead to an SSB of 404 kt in 2012.

**Precautionary approach:** As Bpa is not defined for this stock the catch corresponding to the PA cannot be calculated.

**Management plan:** Following the EU Management plan implies a fishing mortality of 0.3. This results in a TAC change of more than two times as compared with TAC in 2010. Therefore the 15% maximum TAC change applies, resulting in a TAC of 64.4 kt (TAC EU+Russia) in 2011. This is expected to lead to a decrease in fishing mortality to 0.17 and to an increase in SSB to 453 kt.

#### **STECF COMMENTS:**

STECF notes that the situation in former years with significant amounts of non-reported cod landings indicates that overall, enforcement was not effective. However according to ICES, the enforcement improved markedly in 2008, resulting in decrease of underreported catches from previously estimated at over 30% of reported values to less than 7%.

STECF notes that the TAC advice provided by ICES for 2011 assumes a TAC constraint in 2010.

STECF notes that the TAC of 64,000 t for 2011 set in accordance with the multi-annual management plan will, because of the constraint on annual variation in TAC, results in a fishing mortality of 0.17 which is well below the target F of 0.3.

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 105,000 t for 2011 based on a target fishing mortality or Fmsy 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 2011 shall be equal to the fishing effort in 2010 multiplied by the target fishing mortality and divided by the fishing mortality in 2010 ( $\text{Effort}(2011) = \text{Effort}(2010) \times 0.3 / F(2010)$ ). With F (2010) equal to 0.17 the management plan stipulates an increase effort in 2011 by 76% compared to 2010. Assuming a 1:1 ratio between fishing effort and fishing mortality and no catch restrictions this effort increase would result in a fishing mortality of 0.3 in 2011.

This illustrates 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 matches the fishing mortality associated with the agreed TAC. This means that if the TAC for 2011 is fixed at 64,000 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.

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

**FISHERIES:** The total landings of dab have since 2003 been fluctuating between 1,200 t and 1,900 t. 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.

**REFERENCE POINTS:** There are no 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 notes that with reference to the EC Policy paper this stock is classified under category 11. STECF furthermore notes that no TAC is set for this stock.

#### **3.5. 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 2009 the reported landings were 15,650 t, of which 10,582 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.

**REFERENCE POINTS:** No 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 the stocks is unknown.

**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 notes that with reference to the EC Policy paper this stock is classified under category 11. STECF furthermore notes that no TAC is set for this stock.

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

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

Herring Stock Assessment Units	Management Areas
Herring in division IIIa and subdivisions 22-24	Subdivisions 22 – 24 Division IIIa
Subdivisions 25 – 29 (excluding Gulf of Riga) and 32	Subdivisions 25,26,27,29, 32 and 28.2
Gulf of Riga Herring (subdivision 28.1)	Subdivision 28.1 (Gulf of Riga)
Herring in subdivision 30	Subdivisions 30-31
Herring in Subdivision 31	Subdivisions 30-31

### 3.6.1. Herring (*clupea harengus*) in Division IIIa and Subdivision 22 – 24.

ICES advice on the herring stock in division IIIa and subdivisions 22 – 24 was not available at the time of the STECF SGRST Working Group 10-01 meeting and STECFs advice will be provided following the STECF SGRST Working Group 10-02 meeting in July 2010.

### 3.6.2. 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 132,135 t in 2009.

**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. ICES used  $F_{MSY} = 0.19$ .

There is no biological basis at present for determining biomass reference points.

### STOCK STATUS:

		SSB (Spawning Stock Biomass)			
		2007	2008	2009	
<b>MSY</b> ( $B_{trigger}$ )		?	?	?	Undefined
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )		?	?	?	Undefined
		F (Fishing Mortality)			
		2007	2008	2009	
<b>MSY</b> ( $F_{MSY}$ )		–	–	–	Overfishing
<b>Precautionary approach</b> ( $F_{pa}, F_{lim}$ )		○	○	○	At risk

In the absence of defined biomass reference points the state of the stock cannot be evaluated with regard to these. The SSB decreased steadily between the mid-1970s and 2002, increased again until 2006 after which it has been rather stable. The SSB estimate for 2010 is 502, 000 t., 44 % 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  $F=0.26$ .

**RECENT MANAGEMENT ADVICE:**

<b>Management Objective (s)</b>	<b>Catch in 2011</b>
Transition to an <b>MSY approach</b> with caution at low stock size	Less than 95,000
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	Less than 95,000

**MSY approach**

Following the ICES MSY framework implies fishing mortality to be reduced to 0.19 resulting in landings of 95 kt in 2011. This is expected to lead to an SSB of 535 kt in 2012. No MSYBtrigger is defined for this stock, it is still under development. Following the transition scheme towards the ICES MSY framework implies fishing mortality at 0.24 which is higher than  $F_{pa}$ . Therefore  $F_{pa}$  is used and this gives landings of 95 kt in 2011. This is expected to lead to an SSB of 535 000 t in 2012.

**PA approach**

The fishing mortality in 2011 should be no more than  $F_{pa}$  corresponding to landings of less than 95 000 t in 2011.

**EC Policy paper**

In the light of the EU policy paper on fisheries management (17 May 2010, COM (2010) 241) this stock is classified under the category 3. The resulting TAC would be 119 kt.

**STECF COMMENTS:**

STECF 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. Respective calculations are given in Table 1.

STECF also notes that the interpretation of the EC Policy Paper and the resulting TAC of 119 kt advised by ICES was wrong. The stock is classified under category 3. Applying the rules for this category the TAC should be set equal to a catch corresponding to a 30% reduction in fishing mortality.

Taking into account the above mentioned issues STECF has revised the advised catch options provided by ICES:

**MSY approach:** 91,640 t

**Precautionary approach:** 91,640 t.

**EC Policy Paper:** 86,640 t.

**3.6.3. 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 2009 were 38,300 t.

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

**REFERENCE POINTS:** ICES used precautionary reference point for  $F$  ( $F_{pa}$ ) set at 0.40 (from medium-term simulations); and  $F_{MSY} = 0.35$  (based on stochastic simulations). ICES also used  $B_{MSY\ trigger} = 60,000$  t

**STOCK STATUS:**

In relation to the MSY  $B_{trigger}$  biomass of 60,000 t the stock SSB is estimated to be 46% above it in 2010. Following high recruitment, SSB increased in the late-1980s and is currently estimated to be above the long-term average. The year classes of 2005, 2007, and 2009 are strong, while the 2006 year class is poor.

SSB (Spawning Stock Biomass)			
	2007	2008	2009
MSY ( $B_{trigger}$ )	+	+	+
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?
			Above trigger
			Undefined
F (Fishing Mortality)			
	2007	2008	2009
MSY ( $F_{MSY}$ )	-	+	-
Precautionary approach ( $F_{pa}, F_{lim}$ )	o	+	o
			Overfishing
			At risk

**RECENT MANAGEMENT ADVICE:**

Management Objective (s)	Catch in 2011
Transition to an MSY approach with caution at low stock size	Less than 33,100
Cautiously avoid impaired recruitment (Precautionary Approach)	Less than 33,100

**MSY approach**

Following the ICES MSY framework implies fishing mortality to be reduced to 0.35 ( $F = F_{MSY}$ ) resulting in landings of 29,300 t. This is expected to lead to an SSB of 92,900 t in 2012. Following the transition scheme towards the ICES MSY framework implies the current fishing mortality to be reduced to 0.40. This is expected to lead to an SSB of 85,500 t in 2012.

**Precautionary approach**

The fishing mortality in 2011 should be no more than  $F_{pa}$  corresponding to landings of less than 33,100 t in 2011. This is expected to keep SSB above long-term average.

**Policy paper**

Following the EC-policy paper implies that Gulf of Riga herring belongs to category 3 stock for which the TAC should be obtained with applying  $F_{sq} * 0.7$  ( $F = 0.314$ ) or  $F_{MSY}$  with a TAC constraint of 20%.

Since applying  $F_{MSY} = 0.35$  gives a higher TAC in 2011 than  $F_{sq} * 0.7$  the application of  $F_{MSY}$  is chosen resulting in TAC of 29,300 t in 2011. This will lead to a TAC reduction of 12.3% respectively in comparison with 2010.

**STECF COMMENTS:**

STECF notes that the advice provided by ICES is referring to the stock and not to management area. Therefore in the Gulf of Riga herring TAC the average catches of open sea herring in the Gulf of Riga should be included and the average catches of Gulf of Riga herring taken outside the Gulf of Riga should be excluded. Respective calculations are given in Table 1.

Taking into account the above mentioned issues STECF advises the following TACs:

**MSY approach:** 32,660 t

**Precautionary approach:** 36,460 t.

**EC Policy Paper:** 32,660 t.

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	95,000	3,600	240	91,640
Sd 28.1	29,300	240	3,600	32,660

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

**FISHERIES:** Finland and Sweden carry out herring fishery in this area. On average 95% 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 2009 the landings were 68,873 t.

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

**REFERENCE POINTS:** The proposed precautionary reference point for F (Fpa) is set at 0.21 while Flim 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 F0.1 to Fpa.

MSY reference points have not been defined for this stock.

There is no biological basis at present for determining biomass reference points

**STOCK STATUS:**

	SSB (Spawning Stock Biomass)		
	2007	2008	2009
MSY ( $B_{trigger}$ )	?	?	?
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?



F (Fishing Mortality)			
	2007	2008	2009
MSY ( $F_{MSY}$ )	?	?	?
Precautionary approach ( $F_{pa}, F_{lim}$ )	+	+	+
			Undefined
			Harvested sustainably

Following high recruitment the spawning stock tripled in biomass in the late 1980s and has remained high since. The fishing mortality has been below  $F_{pa}$  since the beginning of the time series (1973), fluctuating between 0.1 and 0.2. Recruitment seems to be stable over the last 20 years with the exception of two very rich year classes in 2002 and 2006.

#### RECENT MANAGEMENT ADVICE:

Management Objective (s)	Catch in 2011
Transition to an MSY approach with caution at low stock size	n/a
Cautiously avoid impaired recruitment (Precautionary Approach)	Less than 115,000

#### MSY approach

No MSY reference points available for this stock.

#### Precautionary Approach

The fishing mortality in 2011 should be no more than  $F_{pa}$  corresponding to landings of less than 115,000 in 2011. This is expected to maintain SSB at a high level in 2012.

#### EC Policy paper

Following the policy paper the stock belongs in category 1.

In this case management should set TAC corresponding to the  $F$  that will deliver the highest long term yield, which in this case has been approximated by using  $F_{pa}$ .

#### STECF COMMENTS:

STECF notes that ICES classification of the stock as a category 1 stock is not consistent with the rules laid down in the EC Policy Paper. The state of the stock in relation to MSY is not known and STECF classified the stock as a category 6 stock. In this case the TAC should be set at a level corresponding to the fishing mortality that will deliver maximum sustainable yield but with a maximal change in the TAC of 15 %.  $F_{msy}$  is not defined for the stock. However, STECF has agreed generally to use  $F_{0.1}$  as a proxy for  $F_{msy}$  in absence of better estimates.  $F_{0.1}$  is equal to 0.16 giving a catch of 88,000 t in 2011.

STECF notes that the TAC for herring in the Bothnian Bay covers Subdivisions 30 and 31 and should be set in accordance with the combined advice given for the two herring stocks in the area. STECF advises that the catch of herring in subdivision 31 should be kept at the level observed in recent years corresponding to 3,000 t (see section 3.6.4 Herring in Subdivision 31).

Based on the above considerations STECF advises the following TACs for subdivisions 30 and 31:

**MSY approach:** 91,000 t

**Precautionary approach:** 118,000 t.

**EC Policy Paper:** 91,000 t.

3.6.5. *Herring (Clupea harengus) in Subdivision. 31,*

**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 2009 was about 2,375 t.

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

**REFERENCE POINTS:** No reference points are agreed for the stock.

**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.

SSB (Spawning Stock Biomass)			
	2007	2008	2009
MSY ( $B_{trigger}$ )	?	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	Unknown
F (Fishing Mortality)			
	2007	2008	2009
MSY ( $F_{MSY}$ )	?	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	Unknown

**RECENT MANAGEMENT ADVICE:**

The only new information that is available for herring in Subdivision 31 is landings data. The advice for 2011 is not provided by ICES.

No specific management objectives are known to ICES. The EU manages this stock in conjunction with the stock in subdivision 30.

In the light of the EU policy paper on fisheries management (17 May 2010, COM(2010) 241) this stock is classified under category 11.

**STECF COMMENTS:**

STECF notes that since 2004 the catches have gradually decreased and in 2009 were 2,375 t that are the lowest on record. In recent years the fishery has been largely supported by the strong year-classes of 2002 and 2006. These observations could indicate that the stock may be reduced compared to its long-term status, and that the exploitation rate is unknown. On the other hand, the CPUE indices have increased in recent years and the decrease of catches could be connected with decrease of the demand. In such an unclear situation STECF advises that the catch should be kept at or below the average level observed in most recent years corresponding to 3,000 t.

Following the advice given above STECF classifies the stock under category 6 with reference to the EC Policy paper.

STECFs TAC advice for subdivisions 30 and 31 is given in section 3.6.4.

**3.7. 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 has since 1999 fluctuated between 1.9 and 2.8 kt. ICES Subdivisions 22 and 25 are the main fishing areas and. Poland and Denmark are the main fishing countries.

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

**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.

With reference to the EC Policy paper ICES classified the stock as a category 11 stock.

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

STECF agrees with ICES classification of the stock under category 11.

### **3.8. 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 80 % since 1990, from 5,636 (1990) to 1,103 t (2009). The decline has been largest in the offshore fishery where landings in 2009 were 270 t or only 7 % of landings reported in 1990. Landings from coastal fisheries were 560 t in 2009, which is 43 % of the catches in 1990. River catches have shown no clear trend with reported landings in 2009 of 180 t. 56 % of the EC quota for 2009 was landed.

Unreported catches and discards are estimated to be about 38% 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 was 58,000 fish in 2009.

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.

**REFERENCE POINTS:** To evaluate the state of the stock ICES uses the smolt production relative to the 50% and 75% level of the potential smolt production capacity (PSPC) on a river-by-river basis. ICES uses 75 % of the potential smolt production capacity as criteria for the population recovery to the MSY level.

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

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.

A new long-term management plan for Baltic Salmon is under development. However, at present there is no formal management plan for salmon in this area.

**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

From the 27 rivers assessed by ICES, 11 are likely or very likely to reach the 50% target in 2010. 8 rivers are unlikely to reach that target. No rivers are likely to reach the 75 % target in 2010. 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. Potential smolt production capacity estimates for individual rivers were updated in this years assessment.

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. In assessment unit 3 the smolt production has been on the same level, and in assessment unit 4 a slightly decreasing trend in smolt production has been observed during the period. Wild smolt production of all assessment units combined is now estimated to be 70% of the potential total smolt production. However smolt production is still low in rivers where salmon were extirpated and are now being reintroduced.

The total exploitation rate of salmon has decreased considerably since the beginning of the 1990s, and harvest rate in the offshore fishery in particular shows a clear downgoing trend during the period. However, the harvest rate has increased from 2008 to 2009, mainly as a result of a considerable increase in longline effort and a slight increase in coastal trap net effort.

The post-smolt survival is a key factor influencing the abundance and development of salmon stocks. Updated analysis indicate that the decreasing trend in post-smolt survival has been even more pronounced than previously reported, especially for wild salmon. The post-smolt survival has been very low (around 10 %) since 2004 and shows no signs of increase.

**RECENT MANAGEMENT ADVICE:** In order to ensure recovery of the salmon stocks ICES recommends for 2011 a TAC of not more than 120 000 salmon. This reflects a 25 % reduction in effort compared to 2009.

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, but will also exploit weaker stocks. 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, it is recommended 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:**

STECF agrees with the ICES advice.

STECF notes that with a TAC of 120,000 salmon as advised by ICES, the predicted total catch (reported and unreported commercial catch + recreational catch), would be 201,000 salmon. STECF notes that under this scenario there is an increased probability to reach the 75 % smolt production target.

The overall estimated smolt production will stay high in the near future. 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.

With reference to the EC Policy paper STECF classifies the salmon stock as a category 6 stock. Applying the TAC rules for this category would result in a TAC for 2011 of 249,900 specimens. (15 % decrease).

### **3.9. 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 2009 the nominal landings only amounted to 16,702 specimens or 97 t. Landings of the professional fisheries were 13 476 salmon and those of recreational fisheries were 3226 salmon. Discards due to seal damages were 1860 Salmon. 90 % of the TAC in 2009 was utilised.

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

**REFERENCE POINTS:** Not established.

**STOCK STATUS:** The status of wild salmon stocks or the exploitation rate in the Gulf of Finland has not remarkably changed since the previous assessment. There are three remaining native salmon stocks in the Estonian rivers. In two of those, the estimated smolt production has been less than 10 % of the potential in the last three years. In the third river smolt production has increased significantly. Wild smolt production occurs in the rivers supported by smolt releases as well. Post-smolt survival of reared smolts has been low in recent years.

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

To prevent the extinction of wild populations, further decrease of naturally produced smolts should not be allowed.

1. 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.
2. Wild salmon populations shall be re-established in potential salmon rivers.
3. The level of fishing should be maintained as high as possible. Only restrictions necessary to achieve the first three objectives should be implemented.
4. Reared smolts and earlier salmon life stage releases shall be closely monitored.

A new long-term management plan for Baltic Salmon is under development. However, at present there is no formal management plan for salmon in this area.

**RECENT MANAGEMENT ADVICE:** ICES recommends there should be no catch of wild Estonian salmon in 2010 in the Gulf of Finland. ICES further advises that any increase in total catches from present levels should be prevented.

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.

**STECF COMMENTS:** STECF agrees with ICES recommendation that there should be no catches of wild salmon in the Gulf of Finland and that the total catches should be kept at present levels.

With reference to the EC Policy paper STECF classifies the salmon stock as a category 6 stock. Applying the TAC rules for this category would result in a TAC for 2011 of 13.500 specimens (STECF recommendation).

### **3.10. 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 756 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. However, in 2009 Polish catches increased again to 389 t due to increase in longline fisheries.

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

**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. In 6 of the 9 ICES subdivisions status of the sea trout stocks is below the estimated potential abundance.

**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). This would allow local fisheries for other species to be continued and at the same time reduce by-catch of immature trout. A complement would be to increase the protective areas in rivers, river mouths and along the coast. Furthermore, the effectiveness of closed areas could be improved by adjusting closure time and space to minimize catches of sea trout.

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 with ICES advice.

### 3.11. 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 86,000 t in the 1990 to 529,000 t in 1997. Since then there has been a decrease and landings have been fluctuating around 375,000 t since 2000. In 2009 total catches increased in comparison with the previous three years and reached 407,100 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.

MSY reference points have not been defined for this stock.

#### STOCK STATUS:

SSB (Spawning Stock Biomass)			
	2007	2008	2009
MSY ( $B_{trigger}$ )	?	?	?
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?
F (Fishing Mortality)			
	2007	2008	2009
MSY ( $F_{MSY}$ )	?	?	?
Precautionary approach ( $F_{pa}, F_{lim}$ )	○	○	○

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. The most recent estimate of fishing mortality is  $F=0.54$ , that is above  $F_{PA} = 0.40$ . The fishing mortality has been above  $F_{PA}$  since 2002.

**RECENT MANAGEMENT ADVICE:**

Management objective (s)	Catch in 2011
Transition to an <b>MSY approach</b> with caution at low stock size	n/a
Cautiously avoid impaired recruitment ( <b>Precautionary approach</b> )	Less than 242 kt
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

**MSY Approach**

Not available for this stock

**Precautionary Approach**

Fishing mortality in 2011 should be below  $F_{pa} = 0.40$ , corresponding to landings of less than 242,000 t.

**EU Policy Paper**

Following the policy paper implies a TAC of 288 kt in 2011, which is expected to lead to a decrease in fishing mortality to 0.49, compared to  $F_{sq}$  of 0.54 and to decline of SSB to 652 kt in 2012. The option was selected under condition of a category 3 stock and of a TAC reduction not higher than by 30%.

**STECF COMMENTS:** STECF agrees with the TAC option advised by ICES.

STECF normally uses  $F_{0.1}$  as proxy for  $F_{msy}$  when more appropriate values are not available.  $F_{0.1}$  is estimated at 0.71. This is well above  $F_{pa}$  (0.40) and STECF does not consider  $F_{0.1}$  to be an appropriate proxy for  $F_{msy}$  for this stock. STECF is therefore not in the position to advice on the TAC consistent with a fishing mortality of  $F_{msy}$ .

**3.12. 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 2009 of about 385 t represent an increase by about 30 t from 2007.

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

**REFERENCE POINTS:** There are no reference points agreed 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:** Last year STECF expressed concern about the low landings in recent years. However, the catch figures provided by ICES have been revised upwards and the catches in 2008 and 2009 are now above 300 t.

With reference to the EC Policy paper STECF classifies this stock under category 11.

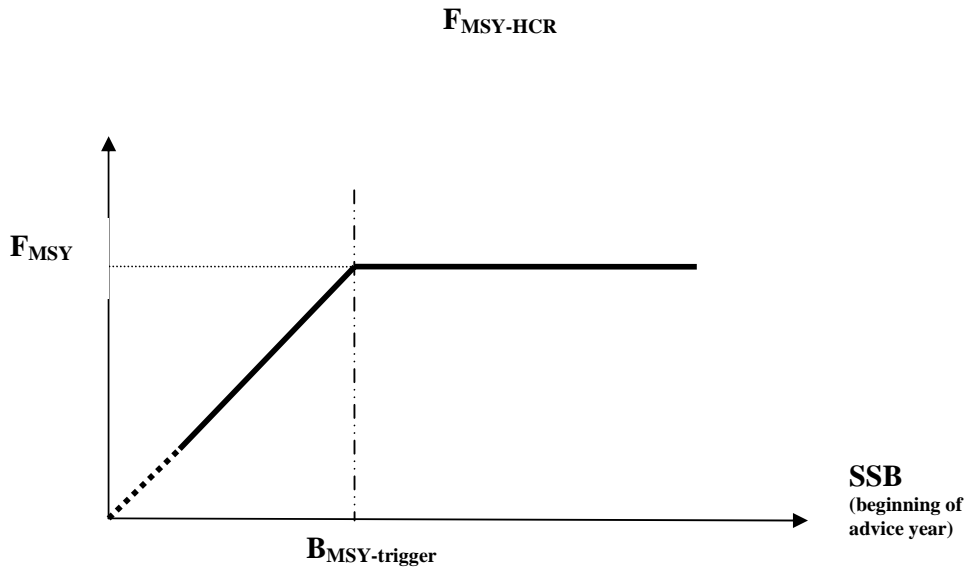
#### 4. ANNEX 1. BASIS FOR ICES MSY ADVICE.

Until 2009, ICES' advice was based on the precautionary approach, extended by long-term considerations for maximising yield and considering ecosystem effects of the fishery. In 2010, ICES has started a more formal approach for the implementation of the maximum sustainable yield-concept in its advice. This follows the requests of clients, inter alia the EU Commission asking for a full implementation no later than 2015 (COM (2006) 360 final).

Maximum sustainable yield is a broad conceptual objective aimed at achieving the highest yield possible over the long term (an infinitely long period of time). It is non-specific with respect to: (a) the biological unit to which it is applied; (b) the models used to provide scientific advice; and (c) the management methods used to achieve MSY. The MSY concept can be applied to an entire ecosystem, an entire fish community, or a single fish stock. The choice of the biological unit to which the MSY concept is applied influences both the sustainable yield that can be achieved and the associated management options. Mostly for practical reasons, implementation of the MSY concept by ICES will first be applied to individual fish stocks. The models (mathematical and conceptual) used to estimate MSY and associated parameters typically assume that all of the factors not explicitly included in the models remain constant. Thus, MSY estimates are almost always conditional estimates based on current conditions and assumptions.

For long lived stocks with population size estimates, ICES bases its MSY approach on attaining a fishing mortality rate at or below  $F_{MSY}$ . In this approach, both fishing mortality and biomass reference points are used; these reference points are  $F_{MSY}$  and  $B_{MSY-trigger}$ . The approach does not use a  $B_{MSY}$  estimate.  $B_{MSY}$  is a notional value around which stock size fluctuates when  $F=F_{MSY}$ . Recent stock size trends may not be informative about  $B_{MSY}$  either because  $F$  has exceeded  $F_{MSY}$  for many years or because current ecosystem conditions are substantially different from those in the past.

$B_{MSY-trigger}$  is a biomass reference point that triggers a cautious response. The cautious response is to reduce fishing mortality to reinforce the tendency for a stock to rebuild and fluctuate around a notional value of  $B_{MSY}$  (even though the notional value is not specified in the framework) when  $F \leq F_{MSY}$ . The concept of  $B_{MSY-trigger}$  evolves from the PA reference point  $B_{pa}$  which ICES has used as a basis for fisheries advice for more than a decade.  $B_{pa}$  is a biomass level above which there is low probability of impaired recruitment. The evolution in the determination of  $B_{MSY-trigger}$  requires contemporary data with fishing at  $F_{MSY}$  to experience the normal range of fluctuations in biomass. The ICES MSY approach is specified in the Harvest Control Rule (HCR) depicted below:



Although the World Summit on Sustainable Development (2002) called for stocks to be restored to levels that can produce MSY by 2015 where possible (which requires that overfishing relative to MSY be ended well in advance of 2015; for many stocks it is already too late), this is not the policy of the European Commission (see COM (2006) 360 final). The EC and other management bodies that request advice from ICES have indicated they favour a gradual transition to implementing the MSY approach.

In the transition period, three catch options will be provided by ICES if the requisite information is available. The first option reflects a stepwise transition to the ICES MSY Harvest Control Rule by 2015. This transition will begin with advice for 2011 if an estimate or a proxy of  $F_{MSY}$  is available. Otherwise, it will begin with advice for 2012. The transition will be in equal steps from the year in which it begins. If the transition begins in 2011, there will be 5 steps ( $n=5$ ). The catch options for 2011 for a transition beginning in 2011 will be:

$$F_{MSY-HCR-transition}(2011) = \text{Min}\{0.8 \cdot F(2010) + 0.2 \cdot F_{MSY-HCR}(2011); F_{pa}\}$$

where  $F_{MSY-HCR}(2011)$  is according to the HCR in Figure 2, being equal to  $F_{MSY}$  if SSB in 2011 is above  $B_{MSY-trigger}$  and reduced linearly if SSB is below. The  $F_{MSY-HCR-transition}(2011)$  values are capped at  $F_{pa}$  to maintain consistency with the precautionary approach. The plan for transition to MSY takes cognizance of the general understanding that managers want a gradual transition, although they have not formally agreed to such a plan.

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**Abstract**

The scientific advice on the stocks and fisheries in the Baltic Sea in 2011, evaluated and endorsed by  
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