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Scientific, Technical and Economic Committee for Fisheries (STECF)

Review of scientific advice for 2014 - part I Advice on stocks in the Baltic Sea (STECF-13-10)

Edited by Eskild Kirkegaard & Hendrik Doerner

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European Commission
Joint Research Centre
Institute for the Protection and Security of the Citizen

Contact information

STECF secretariat

Address: TP 051, 21027 Ispra (VA), Italy

E-mail: stecf-secretariat@jrc.ec.europa.eu

Tel.: 0039 0332 789343

Fax: 0039 0332 789658

<https://stecf.jrc.ec.europa.eu/home>

<http://ipsc.jrc.ec.europa.eu/>

<http://www.jrc.ec.europa.eu/>

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SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF)

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Advice on stocks in the Baltic Sea (STECF-13-10)

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1. BACKGROUND

According to Article 2 of Commission Decision 629 of 26 August 2005 establishing a Scientific, Technical and Economic Committee for Fisheries, STECF shall provide annual advice on the situation of fishery resources relevant to the EU. The first part of the stock advice focuses on stocks and associated fisheries in the Baltic Sea.

2. TERMS OF REFERENCE

The STECF is requested to review and comment on the scientific advice for the Baltic Sea stocks released by ICES in 2013 in particular for the stocks specified below. The text of previous STECF reviews of stocks for which no updated advice is available shall be retained in the report in order to facilitate easy reference and consultation.

STECF is requested, in particular, to highlight any inconsistencies between the assessment results and the advice delivered by the scientific advisory committees of ICES.

In addition, when reviewing the scientific advice from ICES, and any associated management recommendations, STECF is requested to take into account Harvest Control Rules adopted in any type of multi-annual management plan and rules and principles for the setting of catch levels as specified in the Commission Communication to the Council concerning a consultation on Fishing Opportunities for 2014 COM(2013) 319 final.

As regards advice for the central Baltic stocks, STECF is requested to advise on:

- (a) commercial catch levels for 2014 excluding the share of the Russian Federation for the stocks concerned that, based on single stock assessments, result in a fishing mortality rate that restores and maintains all stocks above levels capable of producing MSY by 2015;
- (b) possible changes to the commercial catch levels referred to in a) by taking into account biological interactions among the stocks, and;
- (c) possible spatial measures supporting the MSY objectives taking into account the biological interactions between the stocks concerned;
- (d) effort levels expressed in number of days-at-sea in cod fishery.

In the absence of appropriate scientific criteria or analyses, STECF should advise on the catch levels that are predicted to maintain stocks above the previously-defined Bpa levels.

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 28 June 2013.

Baltic Sea stocks

- Stocks of
 - Cod in subdivisions 22-24
 - Cod in subdivisions 25-32
 - Herring in 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 in subdivisions 22-32
- 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

3. INTRODUCTION

This report represents the STECF review of advice for stocks of interest to the European Union in the Baltic Sea.

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 TAC advice for 2014 is provided in accordance with the rules laid down in Chapter 6 of the Communication from the Commission to the Council concerning a consultation on Fishing Opportunities for 2014 COM(2013) 319-final.

For data-limited stocks for which an abundance index is available, ICES has used a harvest control rule based on an index-adjusted *status quo* catch to provide catch advice for 2014. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data.

Regarding the requested to advice on commercial catch levels for 2014 excluding the share of the Russian Federation for the stocks concerned STECF notes that Russia and EU in 2010 agreed on the sharing of the TAC's for salmon and sprat. STECF has for these stocks provided catch options excluding the Russian share. For the other shared stocks STECF has no information on the Russian quotas for 2014 and has therefore not been able to advice on the catch levels excluding the Russian share.

4. STECF REVIEW OF ICES ADVICE ON RESOURCES IN THE BALTIC SEA

4.1. 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.

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

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

STOCK STATUS:

F (Fishing Mortality)		
		2010–2012
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
		2008–2012
Qualitative evaluation	↗	Increasing

The survey data indicate an increasing trend in stock size until 2011, but low stock size in 2012. The average stock size indicator (number hour⁻¹) in the last two years (2011–2012) is 26% higher than the average of the three previous years (2008–2010).

MANAGEMENT AGREEMENT: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: For this stock the abundance is estimated to have increased by more than 20% between the average of 2008–2010 and the average of 2011–2012. This implies an increase in catches of at most 20% in relation to last year's reported landings, corresponding to no more than 36 tonnes.

Additionally, considering that exploitation is unknown, ICES advises a reduction of 20% as a precautionary buffer. This corresponds to catches of no more than 29 tonnes in 2013. All catches are assumed to be landed.

STECF COMMENTS: STECF agrees with ICES advice.

4.2. 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 (65% of the landings) and gillnets (35%). Landings have in recent years been between 14,000 and 24,000 t with the lowest value of the time series in 2010. Total catch in 2012 is estimated to 20,100 t. of which 17,100 t where commercial landings, 900 t discards and 2,100 t recreational catch.

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 using the SAM assessment model.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY Btrigger	36 400 t	B _{pa} .
Approach	F _{MSY}	0.26	F _{MSY} from stochastic simulations (age range 3–5).
Precautionary Approach	B _{lim}	26 000 t	Break point of the stock–recruitment relationship.
	B _{pa}	36 400 t	1.4*B _{lim} .
	F _{lim}	Not defined.	
	F _{pa}	Not defined.	
Management Plan	SSBMGT	Not defined.	
	FMGT	0.60	EU management plan based on stochastic simulations(reference F age range 3–6).

MANAGEMENT AGREEMENT: The EC 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. High-grading is prohibited in all Baltic fisheries since January 2010.

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F_{MSY})	✗	✗	✗ Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined
Management plan (F_{MGT})	✗	✗	✗ Above target
SSB (Spawning Stock Biomass)			
	2011	2012	2013
MSY ($B_{trigger}$)	✗	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	○	✓	✓ Full reproductive capacity
Management plan (SSB_{MGT})	?	?	? Undefined

SSB has increased since 2000, and the 2012 value is estimated above B_{pa} . F (ages 3–5) in 2012 is estimated at 0.7; although values were estimated with high uncertainty this estimate is well above F_{MSY} . Recruitment has been low since 2004.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU management plan (EC 1098/2007) that the TAC (commercial landings) should be set at 17,037 tonnes in 2014, assuming that discard and recreational fisheries rates do not change from 2012.

Measures should be implemented to protect the local spawners in Subdivision 22.

Management plan approach: Following the agreed EU management plan implies a total fishing mortality of 0.6, which in combination with the 15% TAC constraint corresponds to a TAC (commercial landings) of 17,037 t in 2014. This is conditional on the discard and recreational fisheries rates remaining unchanged from 2012. This is expected to lead to an SSB of 49,000 t in 2015.

MSY approach: Following the ICES MSY approach implies the fishing mortality being reduced to 0.26, resulting in total catches of no more than 10,212 t in 2014. This is expected to lead to an SSB of 58,735 t in 2015. If discard and recreational fisheries rates do not change from 2012, this implies commercial landings of no more than 8,800 t.

Following the transition scheme towards the ICES MSY approach implies the fishing mortality being reduced to 0.35, resulting in total catches of no more than 13,245 t in 2014. This is expected to lead to an SSB of 55,589 tonnes in 2015. If discard and recreational fisheries rates do not change from 2012, this implies commercial landings of no more than 11,300 t.

Precautionary approach: As there is no F_{pa} defined for this stock, the catch corresponding to the precautionary approach cannot be calculated. B_{pa} is 36,400 t, and all options in the outlook will result in an SSB above B_{pa} in 2015.

Additional considerations: The adult cod abundance in Subdivision 22 is presently low, while the abundance of adult cod in Subdivision 24 is at a historical high. Cod spawning in Subdivision 22 likely represents the western Baltic subpopulation, while the adult cod in Subdivision 24 is

considered to be a mixture of populations originating from the eastern and western Baltic Sea. To protect the western Baltic cod spawners, ICES recommends reducing the catches in Subdivision 22, specifically at spawning time. The present targeted fishery on spawning cod in Subdivision 22 in the 1st quarter of the year takes about 17% (in 2012) of the annual catch of cod in Subdivisions 22–24. There are several possible approaches to achieving a protection of these spawners:

- 1) a temporal and spatial spawning closure in Subdivision 22, with the appropriate timing (i.e. February–April), area, and depth (deeper than 20 m);
- 2) a separate (sub-)TAC for Subdivision 22 (as for the Downs component in North Sea herring);
- 3) additional effort restrictions and/or divergence in Subdivision 22.

STECF COMMENTS: STECF agrees with ICES advice.

STECF notes that the fishing mortality in 2013 is predicted to be at least 10% higher than the target fishing mortality (0.6) specified in the multi-annual management plan (Council Regulation (EC) No 1098/2007). Accordingly, Article 8(4) of the multi-annual management plan, prescribes that fishing effort in 2014 shall be reduced by 10% compared to 2013.

4.3. 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 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. There is no indication of unreported landings in 2012. Landings have fluctuated between 42,000 t and 392,000 t over the whole time series, starting in 1965. Total catch in 2012 is estimated to 57,800 t, where 88% are landings (16% by gillnetters and longliners, 84% by trawlers) and 12% discards.

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:

	Type	Value	Technical basis
MSY Approach	MSY Btrigger	88 200	B _{pa} .
	F _{MSY}	0.46	Based on stochastic simulations using stock–recruitment data from 1989–2011.
	Multispecies F _{MSY}	0.55	Multispecies model (SMS).
Precautionary Approach	B _{lim}	63 000	B _{loss} in 2005.
	B _{pa}	88 200	B _{lim} *1.4.
	F _{lim}	Undefined.	
	F _{pa}	Undefined.	
Management Plan	SSB _{MGT}	Undefined.	
	F _{MGT}	0.30	EU management plan based on stochastic simulations (reference F age range 4–7).

MANAGEMENT AGREEMENT: The EC 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. High-grading is prohibited in all Baltic fisheries since January 2010.

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F_{MSY})	✓	✓	✓ Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined
Management plan (F_{MGT})	✗	✗	✗ Above target
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓ Full reproductive capacity

The SSB has increased in recent years and is now estimated to have been above B_{pa} since 2008. Fishing mortality has declined and is now estimated to be below F_{MSY} , since 2009. The abundance of the 2006–2011 year classes is above the average of the last 20 years.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the EU management plan (EC 1098/2007) a TAC of 70,301 t in 2014. This is conditional on the discard rates remaining unchanged from the average of the last three years.

Management plan: Following the agreed EU Management plan implies fishing at an $F(4-7)$ of 0.3, which results in a TAC in 2014 of 70,301 t. This is conditional on the discard rates remaining unchanged from the average of the last three years. This is expected to lead to an increase in SSB to 264,712 t in 2015.

MSY approach: Following the ICES MSY approach implies fishing mortality should be no more than 0.46, resulting in catches of no more than 101,758 t in 2014. This is expected to lead to an SSB of 235,464 t in 2015, above MSY $B_{trigger}$. If discard rates do not change from the average of the last three years, this implies landings of no more than 94 380 tonnes.

No transition is needed as F in 2012 is below F_{MSY} .

Precautionary approach: As there is no F_{pa} defined for this stock, the catch corresponding to the precautionary approach cannot be calculated. B_{pa} is 88,200 t, and all options in the outlook will result in an SSB above B_{pa} in 2015.

Multispecies considerations: Cod multispecies F_{MSY} given as one value does not exist in a multispecies context, as the natural mortality of cod depends on the population size of the other stocks in the Baltic Sea. Long-term yields of cod (estimated from the SMS model) are similar for F

in the range of 0.4–0.6; however, the biomass will differ significantly. Fishing on the prey stocks herring and sprat will influence the food availability for cod and thereby the level of cod cannibalism and cod yield. However, the actually applied F for the prey species (in the range 0.25–0.35) will only marginally affect the long-term yield of cod. Fishing at multispecies $F_{MSY} = 0.55$ would give catches in 2014 of 117,836 t and SSB in 2015 at 220,005 t.

STECF COMMENTS: STECF agrees with the ICES advice.

STECF notes that F_{MSY} has been revised from 0.30 to 0.46.

STECF notes that the fishing mortality in 2013 is predicted to be less than 10% above the target fishing mortality (0.3) specified in the multi-annual management plan (Council Regulation (EC) No 1098/2007). Accordingly, Article 8(5) of the multi-annual management plan, prescribes that the fishing effort in 2014 shall be equal to the fishing effort in 2013 multiplied by the target fishing mortality and divided by the fishing mortality in 2013 ($\text{Effort}(2014) = \text{Effort}(2013) \times 0.3 / F(2013)$).

STECF furthermore notes that the fishing mortality referred to in the management plan covers the age range 4 – 7. ICES has in its assessment used the average fishing mortality for age range 4 – 6.

The fishing mortality for 2013 used by ICES is equal to 0.373 (age range 4 – 6). This corresponds to a fishing mortality of 0.328 for age range 4 – 7. Applying $F(2013) = 0.328$ the management plan stipulates a decrease in fishing effort in 2014 by 8.5% compared to 2013.

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

FISHERIES: The total landings of dab have been fluctuating between 1,000 t and 1,900 t. since 2003. Landings in 2011 were 1,300 t. 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: No reference points are defined for dab in the Baltic.

STOCK STATUS:

F (Fishing Mortality)	
	2010–2012
Qualitative evaluation	 Insufficient information

SSB (Spawning-Stock Biomass)	
	2008–2012
Qualitative evaluation	 Increasing

Survey trends show an increasing trend since 2002. The average stock size indicator (number/hour) in the last two years (2011–2012) is 44% higher than the abundance indices in the three previous years (2008–2010).

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 1,437 t. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

STECF COMMENTS: STECF agrees with ICES advice.


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


FISHERIES: All countries surrounding the Baltic Sea report landings of flounder. It is taken as by-catch in fisheries for cod and to a minor extent, in a directed fishery. Since 1973 total recorded landings have fluctuated between 10 to 20 thousand t. In 2012 the reported landings were 15,900 t, of which 14,049 t is reported from subdivisions 24 to 26. Discards of flounder may be significant higher than flounder landings.

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

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

STOCK STATUS:

F (Fishing Mortality)	
	2010–2012
Qualitative evaluation	 Insufficient information

SSB (Spawning-Stock Biomass)	
	2008–2012
Qualitative evaluation	 Decreasing

Based on trends from the Baltic International Trawl Survey (BITS), the stock has fluctuated without trend. The average stock size indicator (no. hr⁻¹) for the whole distribution area of the survey (SDs 22–28) in the last two years (2011–2012) is 15% lower than the abundance indices in the three previous years (2008–2010).

RECENT MANAGEMENT ADVICE: Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 13,516 t. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

STECF COMMENTS: STECF agrees with the ICES advice.

4.6. 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

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

FISHERIES: Herring of this stock of spring spawners are taken in the North-eastern part of the North Sea, Division IIIa and Sub-divisions 22–24. Division IIIa has directed fisheries by trawlers and purse seiners and by-catches in the small mesh trawl fisheries for sprat, Norway pout and sandeel, while Sub-divisions 22–24 have directed trawl, gillnet and trap net fisheries. The catches of herring taken in the Skagerrak and the Kattegat consist of mixture of autumn spawners from the North Sea stock and spring spawners from the area and from the western Baltic. Landings decreased from 107,000 t in 2002 to 28,000 t in 2011, the lowest level in the time series. Landings in 2012 were 39,000 t. The proportion of the total catch of the spring spawner stock taken in the western Baltic has varied between 42 and 63% since 2002 with an average of 53%.

Two TACs are set for Division IIIa. One covering the catches taken in fisheries using nets with a mesh size equal to or larger than 32 mm (target herring fishery) and one for fisheries using nets with a mesh size smaller than 32 mm (by-catch fishery). The TACs comprises both the autumn- and spring-spawning stocks in the area.

The TAC for the North Sea is based on the advice for the autumn spawners and does not take into account the likely catches of spring spawners.

EU and Norway have agreed that 50% of the quotas for the target herring fishery in Division IIIa in 2012 can be fished in the North Sea.

Landings in 2011 by area, fishery and stock are shown in the table below (WBSS: Western Baltic spring spawners; NSAS: North Sea autumn spawners).

Area where WBSS are being caught	Fleet	Fishery	WBSS 2012 catch	NSAS 2012 catch
Division IIIa	C	Directed herring fisheries with purse-seiners and trawlers.	14 506 t	7 693 t
	D	Bycatches of herring caught in the small-mesh fisheries.	953 t	4 435 t
Subdivisions 22–24	F	All herring fisheries in Subdivisions 22–24.	21 095 t	-
Division IVa East	A	Directed herring fisheries with purse-seiners and trawlers.	2 095 t	-

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The analytical assessment of the spring spawners in IIIa and western Baltic is based on catch data, two acoustic indices and a larvae survey index.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY approach	MSY Btrigger	110 000 t.	Tentatively chosen as B _{pa} , equal to the upper 95% confidence limit of B _{lim} . Benchmark (ICES, 2013b).
	FMSY	0.28	Based on randomized YPR analysis using plotMSY software, and a weighted average of FMSY from i) Beverton and Holt and ii) Ricker stock–recruitment relationships. Benchmark (ICES, 2013a).
Precautionary approach	Blim	90 000 t.	Chosen as B _{loss} based on lack of a well-defined recruitment slope at low SSB. Benchmark (ICES, 2013b).
	Bpa	110 000 t.	Upper 95% confidence limit of B _{lim} using cv from the final-year SSB estimate in the assessment. Benchmark (ICES, 2013b).
	Flim	Not defined.	
	Fpa	Not defined.	

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F_{MSY})	✗	✗	✗ Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	Undefined
SSB (Spawning Stock Biomass)			
	2011	2012	2013
MSY ($B_{trigger}$)	✗	✗	✗ Below trigger
Precautionary approach (B_{pa}, B_{lim})	✗	✗	○ Increased risk

SSB has decreased in recent years, reaching the lowest in the time-series in 2011 at between BPA and Blim. Fishing mortality has been at its lowest in the recent years, but it is still above FMSY in 2012. The stock appears to remain in a low production period; however, recruitment is estimated with high uncertainty.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the transition to the MSY approach that catches in 2014 should be no more than 41,602 t. All catches are assumed to be landed. This advice applies to catches of western Baltic spring spawners in Divisions IVa east and IIIa, and Subdivisions 22–24.

MSY approach: Following ICES MSY approach implies a fishing mortality of 0.28 in 2014. This results in catches of no more than 39,321 t in 2014 from the whole distribution area. This is expected to lead to an SSB of 129,000 t in 2015. All catches are assumed to be landed.

Fishing mortality in 2013 is predicted to be 0.39, which is above FMSY. Following the transition to the ICES MSY approach implies a fishing mortality ($0.2 \times F_{2010} + 0.8 \times F_{MSY}$) of 0.30 in 2014. This results in catches of no more than 41,602 t in 2014 from the whole distribution area. This is expected to lead to an SSB of 127,000 t in 2015. All catches are assumed to be landed.

STECF COMMENTS: STECF agrees with the ICES advice.

STECF notes that the above advised catch limits include a predicted catch of Western Baltic/ IIIa spring spawners of 2,095 t in the eastern part of Division IVa. This indicates that the catch of Western Baltic/IIIa spring spawners from Division IIIa and Western Baltic (subdivisions 22-24) should be limited to 39,501 t.

Assuming a fifty-fifty allocation of the advised catch of Western Baltic spring spawners (41,602 t) between Divisions IIIa and IVa and the Western Baltic and taking into account catches by fishery of North Sea autumn spawners in Division IIIa, STECF advises that catches of herring from Division IIIa and Subdivisions 22- 24 for 2014 should not exceed the following:

Management unit	Advised catch 2013	Predicted catch by stock	
		WBSS	NSAS
Division IIIa target herring fishery	29,104 t	18,848 t	10,256 t
Division IIIa by-catch fishery	4,026 t	905 t	3,031 t
Subdivisions 22 to 24	19,754 t	19,754 t	0 t

STECF underlines that the predicted catch by stock is based on the assumption that the advised catch for Division IIIa is taken from Division IIIa and that no quota is transferred from Division IIIa to the North Sea.

4.6.2. 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 tonnes in 1974 to 91,592 tonnes in 2005. Landings in 2012 were 97,800 t.

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. 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:

	Type	Value	Technical basis
MSY Approach	MSY Btrigger	600 000 t	B _{pa} .
	F _{MSY}	0.26	Stochastic simulations, including S–R relationship.
	Multispecies F _{MSY}	~0.30	SMS.
Precautionary Approach	B _{lim}	430 000 t	B _{loss} .
	B _{pa}	600 000 t	1.4 × B _{lim} .
	F _{lim}	0.52	Consistent with B _{lim} .
	F _{pa}	0.41	Consistent with B _{pa} .

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F _{MSY})	✓	✓	✓ Below target
Precautionary approach (F _{pa} , F _{lim})	✓	✓	✓ Harvested sustainably
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY (B _{trigger})	✓	✓	✓ Above trigger
Precautionary approach (B _{pa} , B _{lim})	✓	✓	✓ Full reproductive capacity

SSB declined until 2001 and then increased, and is currently stable above MSY Btrigger. Fishing mortality increased until 2000, and then decreased, and has been below FMSY since 2003. Recruitment has generally been lower since the 1980s.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 164,000 t. This applies to all catches from the stock. All catches are assumed to be landed.

MSY approach: Following the ICES MSY approach implies fishing at 0.26, corresponding to catches of no more than 164,000 t in 2014. This is expected to lead to an SSB of 659,000 t in 2015. All catches are assumed to be landed.

No transition is needed as the current fishing mortality is below FMSY.

Precautionary Approach: Fishing at F_{pa} would lead to an SSB in 2015 lower than B_{pa} . Therefore, the precautionary advice is based on reaching B_{pa} in 2015, which corresponds to catches of 217,000 t. All catches are assumed to be landed.

Multispecies considerations: Herring multispecies F_{MSY} given as one value does not exist in a multispecies context, as the natural mortality of herring depends on the population size of the other stocks in the Baltic. Long-term yield of herring (estimated from the SMS model) is determined more by the population size of its predator cod than by the F (in the range of 0.25–0.35) on herring itself. The multispecies F_{MSY} (0.3) value for herring used in the outlook table gives the highest long-term yield, based on a biomass of cod that is associated with fishing mortality on cod in the range of 0.4–0.6. Fishing at multispecies $F_{MSY} = 0.3$ would give catches in 2014 equal to 187,000 t and SSB in 2015 at 634,000 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advised forecast catch options for 2014.

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 the table below.

Taking into account the above mentioned issues STECF has revised the advised catch options provided by ICES and advises on the basis of the transition to the MSY approach, that catches in 2014 should be no more than 159,080 t.

Table. Setting of herring catch limits by management area in Sub-divisions 25-27, 28.2, 29&32.

Management area	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	164,000 t	5,100 t	180 t	159,080 t

4.6.3. 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. Landings have fluctuated between 30,000 and 40,000 tonnes since 2000. 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. ICES estimates landings in 2012 to 31,733 t.

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

REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{trigger}$	60 000 t	WKMAMPEL (ICES, 2009).
	F_{MSY}	0.35	WKMAMPEL (ICES, 2009), based on stochastic simulations.
Precautionary Approach	B_{lim}	not defined	
	B_{pa}	not defined	
	F_{lim}	not defined	
	F_{pa}	0.4	From medium-term projections.

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F_{MSY})	✓	✗	✗ Above target
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓ Harvested sustainably

SSB (Spawning Stock Biomass)			
	2011	2012	2013
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	? Undefined

Following high recruitment, SSB increased in the late 1980s and is estimated in 2012 is to be above the MSY $B_{trigger}$. The 2010 year class is estimated to be poor. F has been fluctuating between F_{pa} and F_{MSY} since 2008.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 25,800 t. This applies to all catches from the stock in Subdivisions 28.1 and 28.2 All catches are assumed to be landed.

MSY approach: Following the ICES MSY approach implies fishing at $F = 0.35$, which corresponds to catches no more than 25,800 t in 2014. This is expected to lead to an SSB of 86,900 t in 2015. All catches are assumed to be landed.

Given that F_{2010} is estimated to be below F_{MSY} , no transition to the F_{MSY} option is needed.

Precautionary approach: The fishing mortality in 2014 should be no more than F_{pa} , corresponding to catches of less than 29,100 t in 2014.

Additional considerations: ICES recommends that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and construction on the spawning grounds, should not occur.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advised forecast catch options for 2014.

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 the table below.

Taking into account the above mentioned issues and following ICES MSY approach STECF advises that catches in 2014 should be no more than 30,720 t. (see table below). All catches are assumed to be landed.

Table. Setting of herring catch limits by management area in Sub-division 28.1.

Stock	Stock advice	Average 5 year catch taken outside management area	Average 5year catch of another stock taken in the management area	Management area advice
Sd 28.1	25,800 t	180 t	5,100 t	30,720 t

4.6.4. 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. Landings were relative stable around 20,000 to 30,000 tonnes until 1992, after which they increased to between 50,000 and 60,000 tonnes. A further increase in landings has taken place since 2006. In 2012 the landings were 100,640 t, the highest observed in the time series.

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

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	316 000 t.	2.5% lower percentile of B_{MSY} .
Approach	F_{MSY}	0.15	Stochastic stock simulations with SOM.
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2011	2012	2013	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined

From the end of the 1990s the SSB remained stable until 2003 but has since then more than doubled to a record-high level. There is, however, great uncertainty about the estimates. Since the beginning of the time-series, the most likely estimates of fishing mortality have been below F_{MSY} , exceeding F_{MSY} only in 1997. Prior to 1988, recruitment was stable and low and has continued to remain stable over the past 20 years, but at a higher average value than previously. However, the predation impact on herring stock is presently minor.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 138,345 t. All catches are assumed to be landed.

MSY approach: Following the ICES MSY approach implies a fishing mortality of 0.15, resulting in catches of no more than 138,345 t in 2014. This is expected to result in an SSB of 852,000 t in 2015.

No transition scheme applies as fishing mortality is below F_{MSY} .

Precautionary approach: No precautionary reference points are defined. SSB is expected to remain far above any potential precautionary SSB reference points, in the short term.

Additional considerations: The stock structure in Subdivisions 31 and 30 needs to be further explored. They are currently assessed separately. Given the different development of the two herring stocks in Subdivisions 30 and 31, a common TAC set for both areas might not adequately protect the weaker stock. ICES therefore recommends separate management for the two stocks.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advised forecast catch options for 2014.

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. The advised catch of herring in subdivision 31 in 2014 is 4,317 t (see section 4.6.5 Herring in Subdivision 31).

Based on the above considerations and STECF advises that catches in 2014 for subdivisions 30 and 31 should be no more than 142,662 t. All catches are assumed to be landed.



4.6.5. 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. Landings in 2011 were 3,350 tonnes.

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

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

STOCK STATUS:

F (Fishing Mortality)	
2010–2012	
Qualitative evaluation	 Increasing
SSB (Spawning-Stock Biomass)	
2009–2013	
Qualitative evaluation	 Increasing

An exploratory assessment shows that SSB in the last two years (2011–2012) is 59% higher than the average of the three previous years (2008–2010). The fishing mortality has shown a decreasing trend since 2004; however, an increase in the past two years has been estimated. Abundant year classes have appeared in 2010 and 2011.

RECENT MANAGEMENT ADVICE: Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 4,317 t. All catches are assumed to be landed.

Additional considerations: ICES recommends that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and construction on the spawning grounds, should not occur.

The stock structure in Subdivisions 31 and 30 needs to be further explored. They are currently assessed separately. Given the different development of the two herring stocks in Subdivisions 30 and 31, a common TAC set for both areas might not adequately protect the weaker stock. ICES therefore recommends separate management for the two stocks.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advised forecast catch options for 2014.

The STECF advice on catch limits for subdivisions 30 and 31 is given in sections 4.6.4 and 4.6.5 of this report.

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

ICES assess Baltic plaice as two stocks, one distributed in subdivisions 24 to 32 and one in the Kattegat and subdivisions 22 and 23. This means that there is a mismatch between the assessment areas and the TAC management areas.

STECF has reviewed the two assessments and based on the two catch forecasts and the historical distribution of landings, STECF provides an advice on landing limits for 2014 for subdivisions 22 to 32.

4.7.1. Plaice (*Pleuronectes platessa*) in the Kattegat and subdivisions 22 and 23.

FISHERIES: In Subdivision (SD) 22 plaice is mostly taken in mixed fisheries together with cod. In the Kattegat plaice is almost exclusively a bycatch in the combined Nephrops–sole fishery. Historical information on discard ratio in the Skagerrak and the Kattegat is around 15–25% in weight. Landings in 2011 were 1,845 t (65% active gears and 33% passive gears). Discard is estimated by ICES to be around 800 t.



The distribution of landings by area in the period 2002 to 2011 is given in section 4.7.3.

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

REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY B _{trigger}	Undefined.	
	F _{MSY}	0.25	F _{MSY} for neighbouring North Sea stock. Since selectivity in Kattegat is towards larger fish (discards are considerably lower) this proxy is considered conservative and in the range of other possible proxies.
Precautionary approach	Not defined		

STOCK STATUS:

F (Fishing Mortality)	
2010–2012	
Qualitative evaluation	 Below provisional ref. point
SSB (Spawning-Stock Biomass)	
2009–2013	
Qualitative evaluation	 Increasing

The exploratory assessment shows that fishing mortality has dropped since 2006, and SSB has been increasing since 2009. The SSB in the last two years (2011–2012) is 76% higher than the average of the three previous years (2008–2010). Fishing mortality is below FMSY proxy.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 2,224 t. Discards are known to take place but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore, total catches cannot be calculated.

For this stock, the biomass estimated from the exploratory assessment is estimated to have increased by 76% between the average of 2009–2011 (three years) and the average of 2012–2013 (two years). The fishing mortality in 2012 is estimated to be 0.16; the fishing in 2014 could

therefore be increased by 56% to explore the stock at FMSY. Since the product of 1.16 and 1.56 (SSB and fishing mortality increase) is larger than 1.2, this implies an increase of landings of at most 20% in relation to last year's landings, corresponding to landings in 2013 of no more than 2224 t.

STECF COMMENTS: STECF agrees with ICES advice.

The STECF advice on landing limits for subdivisions 22 to 32 is given in section 4.7.3 of this report.

4.7.2. *Plaice (Pleuronectes platessa) in subdivisions 24 to 32.*

FISHERIES: Total landings in 2012 were 848 t (mainly trawl gear). Discards are twice as high as landings in 2012. Landings are mainly from Subdivisions 24 and 25. Subdivision 26 is considered a 100% discard area with a trawl fishery mainly targeting cod. There are occasional catches of plaice in Subdivisions 27 and 28.

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

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

STOCK STATUS:

F (Fishing Mortality)	
	2010–2012
Qualitative evaluation	? Insufficient information
SSB (Spawning-Stock Biomass)	
	2008–2012
Qualitative evaluation	↗ Increasing

Survey trends have increased steadily since the early 2000s by about five times. The average stock size indicator (no. hr⁻¹) in the last two years (2011–2012) is 61% higher than the abundance indices in the three previous years (2008–2010).

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 1,000 tonnes. Discards are known to take place but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore, total catches cannot be calculated.

For this stock the abundance is estimated to have increased by more than 20% between the average of 2008–2010 (three years) and the average of 2011–2012 (two years). This implies an increase of landings of at most 20% in relation to the average landings of the last three years (i.e. 833 tonnes for the period 2010 to 2012), corresponding to landings of no more than 1,000 t in 2014.

Though the exploitation status is unknown, the effort in the main fisheries has not increased since 2007 (STECF, 2012) and the abundance has increased continually since 2003; therefore, no additional precautionary reduction is needed. Discards are known to be substantial, but data are insufficient to estimate a discard proportion that could be applied to give catch advice.

STECF COMMENTS: STECF agrees with the ICES advice.

The STECF advice on landing limits for subdivisions 22 to 32 is given in section 4.7.3 of this report.

4.7.3. Advice for plaice (*Pleuronectes platessa*) in subdivisions 22 to 32.

The advised landing limits for plaice in 2014 for Kattegat and the Baltic Sea is as outlined in sections 4.7.1 and 4.7.2; 2,224 t for Kattegat and subdivisions 22 and 23 and 1000 t for subdivisions 24 to 32.

The predicted landings in subdivision 22 to 32 under the above advised scenarios depends on the distribution of the landings between the Kattegat and subdivisions 22 and 23. The relative proportion of landings from subdivisions 22 and 23 has shown an increasing trend over the latest teen years as shown in the table below. Assuming 90% of the landings in 2014 to be taken in subdivision 22 and 23 will give a landing limit for plaice in 2014 in the Baltic Sea of 3,002 t (2,002 t from the Kattegat and subdivision 22 and 23 stock and 1,000 t from the subdivision 24 to 32 stock).

Year	Landings in t		Relative distribution of landings by area	
	Kattegat	sd 22 and 23	Kattegat	sd 22 and 23
2002	2030	1847	52%	48%
2003	2296	1085	68%	32%
2004	1609	1006	62%	38%
2005	1251	1139	52%	48%
2006	1550	851	65%	35%
2007	1380	1219	53%	47%
2008	1008	1003	50%	50%
2009	659	1008	40%	60%
2010	497	1043	32%	68%
2011	368	1218	23%	77%
2012	226	1627	12%	88%

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

FISHERIES: Reported total landings in the Baltic Sea (including recreational fishery) declined from 5,636 t in 1990 to 886 t in 2010. Since then landings increased to 1,139 tons in 2012. The decline has been largest in the offshore fishery where reported landings in 2012 were 290 t or less than 10 % of landings reported in 1990. Landings from coastal fisheries were 450 t in 2012, which is 34 % of the catches in 1990. River catches have shown no clear trend with reported landings in 2010 of 330 t. 90 % of the EC quota for 2012 was landed.

Unreported and misreported catches are estimated to be 19% and discards are estimated to be 4% of the total catches (including recreational catches).

The catch decrease since 1990 is largely explained by quota and national restrictions, reduced post-smolt survival, increased seal damage to catches and gear 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 53,000 fish in 2012.

There has been an increase in the proportion of wild salmon in catches, relative to reared salmon, which reflects the increased wild smolt production

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) for the years 1997–2010. A new long-term management plan for Baltic Salmon has been adopted by the Commission and is under discussion in Parliament and in Council. In that plan a constant fishing mortality rate of 0.1 in marine fisheries (including vessels offering services for recreational fisheries) is proposed as a basis for setting a TAC. However, at present there is no formal management plan for salmon in the Baltic Sea.

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 Perhönjoki 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

Of the 27 rivers assessed by ICES, the probability of having reached 50% of the PSPC in 2012 is above 70% for nine rivers, between 30% and 70% for nine rivers, and below 30% for nine rivers. The probability of having reached 75% of PSPC in 2012 is above 70% for only two of the 27 rivers. 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.

The current smolt production is a result of the spawning run several years ago. The relatively weak spawning migrations in 2010 and 2011, followed by the very strong spawning run in 2012, will likely result in reduced smolt production in the near future followed by a marked increase in smolt production.

The total wild smolt production has increased almost tenfold in assessment units 1–2 since 1997. In assessment unit 3 the smolt production has remained at the same level, and in assessment unit 4 a slightly decreasing trend in smolt production has been observed during the period. Smolt production in assessment unit 5 has been low and without any signs of improvement. Wild smolt production of assessment units 1 to 4 combined is now estimated to be 70% of the potential total smolt production. Smolt production is still low in rivers where salmon were extirpated and are now being reintroduced.

The harvest rate (catch relative to abundance) of salmon has decreased considerably since the beginning of the 1990s. In 2008, when the driftnet ban was implemented, the offshore harvest rate went down strongly. However, exploitation in the longline fishery increased rapidly from 2008 and the offshore harvest rate in 2010 was close to the harvest rate for offshore fisheries in the early and mid-2000s. Since then, the harvest rate in the offshore fishery has again declined and is now at an all time low. The harvest rate in the coastal fishery shows an overall declining trend, reaching the lowest value in 2012.

The post-smolt survival is a key factor influencing the abundance and development of salmon stocks. It has declined from the late 1980s until the mid-2000s. However, since then there have been some indications of improvement. Especially the post-smolt survival of the 2010 smolt cohort seems to have been higher than the last years' average.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach that total commercial sea removal (dead catch) in 2014 should not exceed 116,000 salmon. This corresponds to reported commercial sea landings (TAC) of no more than 78,000 salmon, assuming similar percentages of unreporting (18%), misreporting (10%), and dead discards (5%) in this removal as in 2012. A TAC higher than 78,000 salmon could be possible if unreporting and misreporting were reduced.

ICES advises that management of salmon fisheries should be based on the status of individual river stocks. Fisheries on mixed stocks that cannot target only river stocks with a healthy status, present particular threats to stocks that do not have a healthy status. Effort in such fisheries should be reduced. Fisheries in open sea areas or coastal waters are more likely to pose these problems than fisheries in estuaries and rivers.

Salmon stocks in the rivers Rickleån and Öreälven in the Gulf of Bothnia, Emån in southern Sweden, and in a majority of the rivers in the southeastern Main Basin are especially weak. These stocks need longer-term stock rebuilding measures, including fisheries restrictions, habitat restoration, and removal of physical barriers. In order to maximize the potential recovery of these stocks, further decreases in exploitation are required along their feeding and spawning migration routes. The offshore fishery in the Main Basin catches all weak salmon stocks on their feeding migration. The coastal fishery catches weak stocks from northern rivers when the salmon pass the Åland Sea and the Gulf of Bothnia on their spawning migration.

STECF COMMENTS: STECF agrees with the ICES advice that total commercial sea removals should not exceed 116,000 salmon. Assuming the same proportion of unreporting, misreporting and dead discards in this removal as in 2012, this corresponds to a TAC of no more than 78,000 salmon.

According to the sharing agreement between Russia and EU the Russian share of the TAC should be 1.9%. Following the ICES MSY approach and assuming the same proportion of unreporting, misreporting and dead discards in 2014 as in 2012, this would result in a catch level in 2014 excluding the Russian share of no more than 76,518 salmon.

STECF notes, that this scenario would result to a high probability of further increase in smolt production in the majority of the assessed salmon stocks.

STECF notes, that the obligation to land all catches will come into force in Baltic salmon fisheries 1st January 2014. Due to this, the assumption that the proportion of discarded salmon in 2014 would be the same as in 2012 may not hold. STECF further notes, that especially the estimated misreporting has been clearly reduced in 2010-2012, possibly due to enhanced fisheries control in the Baltic salmon fisheries. If this trend continues, the assumption that unreporting and misreporting in 2014 would be in the same level as in 2012 will not hold.

4.9. 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 nominal landings (including recreational fisheries) amounted to about 80,000 specimens, but in 2012 the nominal landings only amounted to 11,375 specimens or 75 t. Landings of the recreational fisheries were 950 salmon. Discards due to seal damages were 1,573 salmon. Approximately 65 % of the TAC in 2012 was utilised. Salmon from the Gulf of Finland are feeding to a substantial rate in the Main Basin area and are partly harvested there. Also, catches in the Gulf of Finland consist to some extent of salmon originating from Gulf of Bothnia.

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 50 % of the potential in most years. Despite a decrease in 2012, smolt production in recent years has been higher than in the past. In the third river smolt production has varied significantly from 10% to almost 100% of the potential. 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) for the years 1997–2010. A new long-term management plan for Baltic Salmon has been adopted by the Commission and is under discussion in Parliament and in Council. In that plan a constant fishing mortality rate of 0.1 in marine fisheries (including vessels offering services for recreational fisheries) is proposed as a basis for setting a TAC. However, at present there is no formal management plan for salmon in the Baltic Sea.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that effort in fisheries catching salmon in Subdivision 32 should not increase. Assuming the amount of reared salmon released in 2013 is similar to previous years, this corresponds to a total commercial sea removal (dead catch) in 2014 not exceeding 9,000 salmon. Assuming the same proportion of discards in this removal as in 2012 (10%, where almost all discards are due to seal damage), this corresponds to commercial sea landings of no more than 8,000 salmon.

There should be no fishery targeting wild salmon from the Gulf of Finland. In addition, improved measures to reduce potential bycatch of wild salmon in other fisheries should be considered. Such measures could include relocation of coastal fisheries away from sites likely to be on the migration paths of Gulf of Finland wild salmon, relocating fisheries away from rivers and rivers mouths supporting wild stocks, and protection of wild salmon (from poaching) when they return to rivers. Effort in the fishery in the Main Basin should not increase, as salmon from the Gulf of Finland use the Main Basin as a feeding area.

STECF COMMENTS: STECF agrees with the ICES advice that total commercial sea removals should not exceed 9,000 salmon. Assuming the same proportion of discards in this removal as in 2012, this corresponds to a TAC of no more than 8,000 salmon.

According to the sharing agreement between Russia and EU the Russian share of the TAC should be 9.3%. Following the ICES precautionary approach and assuming the same proportion of discards

in 2014 as in 2012, this would result in a catch level in 2014 excluding the Russian share of no more than 7,256 salmon.

STECF notes that the obligation to land all catches will come into force in Baltic salmon fisheries 1st January 2014. Due to this, the assumption that the proportion of discarded salmon in 2014 would be the same as in 2012 may not hold.

4.10. 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 1,442 t in 2000 to 387 t in 2012. Catches in 2012 were 15 % less than in 2011 and lowest since the early 1980's. 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. Since then the Polish catches increased again to 454 t in 2010 due to increase in longline fisheries, but decreased again to 147 t in 2012. The Polish sea trout catch may be overestimated due to misreporting salmon as sea trout.

Sea trout catch in the recreational fishery is not exactly known. In spite of figures being uncertain, the share of recreational fishery constitutes a significant part of the total catch.

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

REFERENCE POINTS: Not established.

STOCK STATUS: New available data (landings and surveys) did not change the perception of the sea trout stocks in the Baltic Sea.

The Baltic Sea contains approximately 1,000 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 if the river habitat was optimal and the populations stable.

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: New available data (landings and surveys) did not change the perception of the sea trout stocks in the Baltic Sea. Therefore, the advice for 2014 is the same as the advice for 2013:

ICES advises on the basis of precautionary considerations that exploitation rates in the Gulf of Bothnia (ICES Subdivisions 30 and 31) and the Gulf of Finland (ICES Subdivision 32) should be reduced to safeguard the remaining wild sea trout populations in the region, both locally and on their migration routes. Additional management measures for Subdivisions 30–32 should be considered, in particular to address bycatch of sea trout. These could include minimum mesh size for gillnets, effort limitations, fishing bans at river mouths, minimum legal landing sizes, and closures in time and space.

Existing fishing restrictions in ICES Subdivisions 22–29 (for example closed season, fishing bans at river mouths, minimum landing size, and minimum mesh sizes) should be maintained. Habitat improvements by restoration are needed and accessibility to spawning and rearing areas should be improved in many rivers.

STECF COMMENTS: STECF agrees with ICES advice.

STECF notes that no TAC is set for sea trout in the Baltic Sea and most of the catch is taken as bycatch in fisheries targeting other species. Therefore exploitation rates are most effectively reduced by fishing restrictions and management measures such as described in the ICES's advice.

4.11. Sprat (*Sprattus sprattus*) in IIbcd, 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. Landings in 2012 were 231,000 t., the lowest observed since 1993. Trawlers account for most of the catches. 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, and has not been replaced.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY approach	MSY B _{trigger}	570 000 t	Assumed at B _{pa} .
	F _{MSY}	0.29	Stochastic simulations, including S–R relationship.
	Multispecies F _{MSY}	0.30	Multispecies model SMS.
Precautionary approach	B _{lim}	410 000 t	S–R relationship (biomass which produces half of maximal recruitment).
	B _{pa}	570 000 t	B _{lim} × 1.4.
	F _{lim}	0.39	Consistent with B _{lim} .
	F _{pa}	0.32	Consistent with B _{pa} .

STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F _{MSY})	✗	✓	✓ Appropriate
Precautionary approach (F _{pa})	✓	✓	✓ Harvested sustainably
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY (B _{trigger})	✓	✓	✓ Above trigger
Precautionary approach (B _{pa} , B _{lim})	✓	✓	✓ Full reproductive capacity

SSB has declined from a historical high in the late 1990s, and in 2012 remains above the MSY B_{trigger}. The fishing mortality in 2012 is at F_{MSY}. None of the recent four year classes (2009–2012) are strong; but the 2012 year class is estimated to be average.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 247,000 t. All catches are assumed to be landed. A spatial management plan needs to be developed.

MSY approach: Following the ICES MSY approach implies a fishing mortality at 0.29, resulting in catches of no more than 247,000 t in 2014. This is expected to lead to an SSB of more than 838 kt in 2015. All catches are assumed to be landed.

No transition is needed as the current fishing mortality is at FMSY

Precautionary approach: The fishing mortality in 2014 should be no more than Fp a, corresponding to catches of 268,000 t. This is expected to keep SSB above Bp a in 2015.

Multispecies considerations: Sprat multispecies F_{MSY} given as one value does not exist in a multispecies context, as the natural mortality of sprat depends on the population size of the other stocks in the Baltic. Long-term yield of sprat (estimated from the SMS model) is more determined by the population size of its predator cod than the F (in the range 0.25–0.35) on sprat itself. The multispecies F_{MSY} (0.3) value for sprat gives the highest long-term yield, given a biomass of cod associated with fishing mortality on cod that is in the range of 0.4–0.6. Fishing at multispecies $F_{MSY} = 0.3$ would give catches in 2014 equal to 253,000 t and SSB in 2015 at 832,000 t.

Additional considerations: ICES recommends that a spatial management plan is developed for the clupeid stocks. The density of cod in Subdivision 25–26 is at a historical high and cod growth is considered to be limited due to food limitation. Sprat and herring are the major food items for cod, but the present high biomass of the two prey stocks is mainly distributed outside the distribution area for cod. Any fishery on the two prey species in the cod distribution area will potentially decrease the local prey density, which may lead to increased food deprivation for cod. The relative landings proportion of sprat in the main cod distribution area has since 2010 increased from 37% of the total landings to 49% in 2012. This increase in fishing pressure may exacerbate the food condition for cod as the availability decreases. Restrictions on sprat landings taken in the main cod area (Subdivisions 25–26) should be established. Redistribution of the fishery to the northern areas (Subdivisions 27–32) may also reduce the density dependent effect, i.e. increase growth for the clupeids in the area. The exploitation of sprat will have to be reduced as the cod stock recovers, especially in Subdivision 25 where most of the cod biomass is presently distributed.

STECF COMMENTS: STECF agrees with the ICES advice.

According to the sharing agreement between Russia and EU the Russian share of the TAC should be 10.08%. Following the ICES MSY approach this would result in a catch level in 2014 excluding the Russian share of no more than 222,102 t.

4.12. 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 have shown a decreasing trend. Landings in 2012 were 230 t, the lowest level observed since 1985.

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 survey data are very noisy, but there is no indication of a decline in stock size.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: New data (surveys) available for this stock do not change the perception of the stock. Therefore, the advice for this fishery in 2014 is the same as the advice for 2013: "Based on the ICES approach for data-limited stocks, ICES advises that catches should be less than 220 tonnes".

STECF COMMENTS: STECF agrees with ICES advice.

5. LIST OF STECF MEMBERS

1 - Information on STECF members and invited experts' affiliations is displayed for information only. In some instances the details given below for STECF members may differ from that provided in Commission COMMISSION DECISION of 27 October 2010 on the appointment of members of the STECF (2010/C 292/04) as some members' employment details may have changed or have been subject to organisational changes in their main place of employment. In any case, as outlined in Article 13 of the Commission Decision (2005/629/EU and 2010/74/EU) on STECF, Members of the STECF, invited experts, and JRC experts shall act independently of Member States or stakeholders. In the context of the STECF work, the committee members and other experts do not represent the institutions/bodies they are affiliated to in their daily jobs. STECF members and invited experts make declarations of commitment (yearly for STECF members) to act independently in the public interest of the European Union. STECF members and experts also declare at each meeting of the STECF and of its Expert Working Groups any specific interest which might be considered prejudicial to their independence in relation to specific items on the agenda. These declarations are displayed on the public meeting's website if experts explicitly authorized the JRC to do so in accordance with EU legislation on the protection of personnel data. For more information: <http://stecf.jrc.ec.europa.eu/adm-declarations>

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Name	Address ¹	Tel.	Email
STECF members			
Abella, J. Alvaro (vice-chair)	ARPAT – AREA MARE Agenzia Regionale per la Protezione Ambientale della Toscana Articolazione Funzionale RIBM Risorse Ittiche e Biodiversità Marina Via Marradi 114, 57126 Livorno – Italia	Tel. 0039-055-3206956	alvarojuan.abella@arpat.toscana.it

Name	Address ¹	Tel.	Email
STECF members			
Andersen, Jesper Levring (vice-chair)	Department of Food and Resource Economics (IFRO) Section for Environment and Natural Resources University of Copenhagen Rolighedsvej 25 1958 Frederiksberg Denmark	Tel.dir.: +45 35 28 68 92	jla@ifro.ku.dk
Bailey, Nicholas	Fisheries Research Services Marine Laboratory, P.O Box 101 375 Victoria Road, Torry Aberdeen AB11 9DB UK	Tel: +44 (0)1224 876544 Direct: +44 (0)1224 295398 Fax: +44 (0)1224 295511	baileyn@marlab.ac.uk n.bailey@marlab.ac.uk
Bertignac, Michel	Laboratoire de Biologie Halieutique IFREMER Centre de Brest BP 70 - 29280 Plouzane, France	tel : +33 (0)2 98 22 45 25 - fax : +33 (0)2 98 22 46 53	michel.bertignac@ifremer.fr
Cardinale, Massimiliano	Föreningsgatan 45, 330 Lysekil, Sweden	Tel: +46 523 18750	massimiliano.cardinale@slu.se
Casey, John (chair)	CEFAS Lowestoft Laboratory, Pakefield Road, Lowestoft Suffolk, UK NR33 0HT	Tel: +44 1502 52 42 51 Fax: +44 1502 52 45 11	john.casey@cefass.co.uk
Curtis, Hazel	Sea Fish Industry Authority 18 Logie Mill Logie Green Road Edinburgh EH7 4HS	Tel: +44 (0)131 558 3331 Fax: +44 (0)131 558 1442	H.Curtis@seafish.co.uk
Delaney, Alyne	Innovative Fisheries Management, -an Aalborg University Research Centre, Postboks 104, 9850 Hirtshals, Denmark	Tel.: +45 9940 3694	ad@ifm.aau.dk
Daskalov, Georgi	Laboratory of Marine Ecology, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences	Tel.: +359 52 646892	gmdaskalov@yahoo.co.uk
Döring, Ralf	Thünen Bundesforschungsinstitut, für Ländliche Räume, Wald und Fischerei, Institut für Seefischerei - AG Fischereiökonomie, Palmallee 9, D-22767 Hamburg, Germany	Tel.: 040 38905-185 Fax.: 040 38905-263	ralf.doering@ti.bund.de
Gascuel, Didier	AGROCAMPUS OUEST 65 Route de Saint Brieu, bat.4 CS 84215, F-35042 RENNES Cedex France	Tel:+33(0)2.23.48.55.34 Fax: +33(0)2.23.48.55.35	Didier.Gascuel@agrocampus-ouest.fr
Graham, Norman	Marine Institute, Fisheries Science Services (FSS), Rinville, Oranmore, Co. Galway, Ireland	Tel: + 353(0) 91 87200	norman.graham@marine.ie
Garcia Rodriguez, Mariano	Instituto Español de Oceanografía, Servicios Centrales, Corazón de María 8, 28002, Madrid, Spain		Mariano.Garcia@md.ieo.es

Name	Address ¹	Tel.	Email
STECF members			
Gustavsson, Tore Karl-Erik	Fiskeriverket, National Board of Fisheries, Ekonomi och personalenheten, Box 423, 401 26, Göteborg, Sverige	Tel. 00-46-31-74-30-300 Fax 00-46-31-74-30-444	tore.gustavsson@fiskeriverket.se
Jennings, Simon	CEFAS Lowestoft Laboratory, Pakefield Road, Lowestoft Suffolk, UK NR33 0HT	Tel.: +44 1502562244 Fax: +44 1502513865	simon.jennings@cefass.co.uk
Kenny, Andrew	CEFAS Lowestoft Laboratory, Pakefield Road, Lowestoft Suffolk, UK NR33 0HT	Tel.: +44 1502562244 Fax: +44 1502513865	andrew.kenny@cefass.co.uk
Kirkegaard, Eskild	DTU Aqua, National Institute of Aquatic Resources, Technical University of Denmark, Charlottenlund Slot, Jægersborg Allé 1, 2920 Charlottenlund, Denmark	Tel: +45 33 96 33 42 Fax: + 45 33 96 33 49	ek@aquadtu.dk
Kraak, Sarah	University College Cork Based at: Marine Institute, Rinville, Oranmore, Co Galway, Ireland	Tel: +353 (0)91 387392 Fax +353 (0)91 387201	Sarah.kraak@marine.ie
Kuikka, Sakari	University of Helsinki, Department of Environmental Sciences, P.O. Box 65 (Viikinkaari 1), FI-00014 University of Helsinki, FINLAND	Tel.: +358 50 3309233 Fax. +358-9-191 58754	skuikka@mappi.helsinki.fi
Martin, Paloma	CSIC Instituto de Ciencias del Mar Passeig Marítim, 37-49 08003 Barcelona Spain	Tel: 34.93.2309500 direct line : 34.93.2309552 Fax: 34.93.2309555	paloma@icm.csic.es
Malvarosa, Loretta	NISEA S.c.a.r.l.		malvarosa@nisea.eu
Murua, Hilario	AZTI - Tecnalia / Unidad de Investigación Marina, Herrera kaia portualdea z/g 20110 Pasaia (Gipuzkoa), Spain	Tel: 0034 667174433 Fax: 94 6572555	hmurua@azti.es
Nord, Jenny	The Swedish Agency of Marine and Water Management (SwAM)	Tel. 0046 76 140 140 3	Jenny.nord@havochvatten.se
Nowakowski, Piotr	West Pomeranian University of Technology – Faculty of Food Science and Fisheries, Department of Fishing Technique, Szczecin		piotr.nowakowski@zut.edu.pl
Prelezzo, Raul	AZTI - Tecnalia / Unidad de Investigación Marina Txatxarramendi Ugarteia z/g 48395 Sukarrieta (Bizkaia), Spain	Tel: 94 6029400 Ext: 406- Fax: 94 6870006	rprelezzo@suk.azti.es
Sala, Antonello	Fishing Technology Unit National Research Council (CNR) Institute of Marine Sciences (ISMAR) - Fisheries Section Largo Fiera della Pesca, 1 60125 Ancona - Italy	Tel: +39 071 2078841 Fax: +39 071 55313	a.sala@ismar.cnr.it

Name	Address ¹	Tel.	Email
STECF members			
Scarcella, Giuseppe	Environmental Management Unit National Research Council (CNR) Institute of Marine Sciences (ISMAR) - Fisheries Section Largo Fiera della Pesca, 1 60125 Ancona - Italy	Tel: +39 071 2078846 Fax: +39 071 55313	g.scarcella@ismar.cnr.it
Somarakis, Stylianos	Department of Biology University of Crete Vassilika Vouton P.O. Box 2208 71409 Heraklion Crete Greece	Tel.: +30 2610 394065, +30 6936566764	somarak@biology.uoc.gr
Stransky, Christoph	Thünen Institute [TI-SF] Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute of Sea Fisheries, Palmaille 9, D-22767 Hamburg, Germany	Tel. +49 40 38905-228 Fax: +49 40 38905-263	christoph.stransky@ti.bund.de
Theret, Francois	Scapêche 17 Bd Abbé Le Cam 56100 Lorient France		ftheret@comata.com
Ulrich, Clara	DTU Aqua, National Institute of Aquatic Resources, Technical University of Denmark, Charlottenlund Slot, Jægersborg Allé 1, 2920 Charlottenlund, Denmark		cu@aqua.dtu.dk
Vanhee, Willy	ILVO - Institute for Agricultural and Fisheries Research Unit Animal Sciences - Fisheries Ankerstraat 1, B-8400 Oostende, Belgium	Tel 00-32-59-34-22-55 Fax 00-32-59-33-06-29	willy.vanhee@ilvo.vlaanderen.be
van Oostenbrugge, Hans	Landbouw Economisch Instituut- LEI, Fisheries Section, Burg. Patijnlaan 19 P.O.Box 29703 2502 LS The Hague The Netherlands	Tel:+31 (0)70 3358239 Fax: +31 (0)70 3615624	Hans.vanOostenbrugge@wur.nl
External expert			
Leskelä, Ari	Finnish Game and Fisheries Research Institute, Yliopistokatu 6, FI-80100 Joensuu, FINLAND		ari.leskela@rktl.fi

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Author(s):

STECF members: Casey, J., Abella, J. A., Andersen, J., Bailey, N., Bertignac, M., Cardinale, M., Curtis, H., Daskalov, G., Delaney, A., Döring, R., Garcia Rodriguez, M., Gascuel, D., Graham, N., Gustavsson, T., Jennings, S., Kenny, A., Kirkegaard, E., Kraak, S., Kuikka, S., Malvarosa, L., Martin, P., Motova, A., Murua, H., Nord, J., Nowakowski, P., Prellezo, R., Sala, A., Scarcella, G., Somarakis, S., Stransky, C., Theret, F., Ulrich, C., Vanhee, W. & Van Oostenbrugge, H.

External expert: Leskelä, A.

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Abstract

The scientific advice on the stocks and fisheries in the Baltic Sea in 2014 evaluated and endorsed by the Scientific, Technical and Economic Committee for Fisheries (STECF) by written procedure in June 2013 on a request by the European Commission.

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