

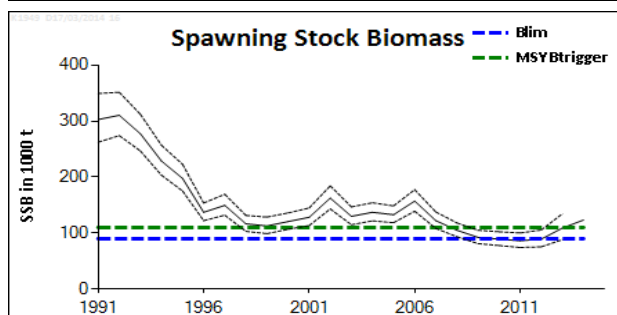
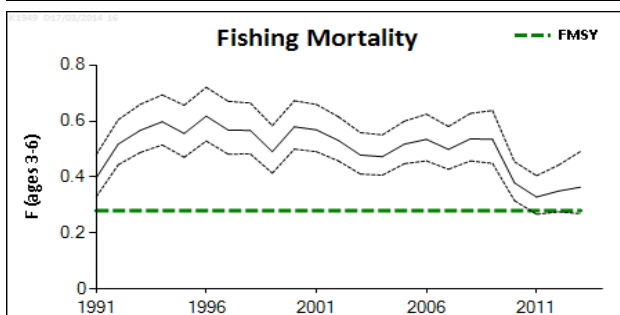
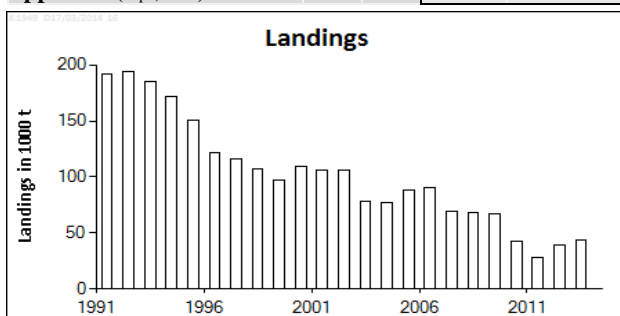
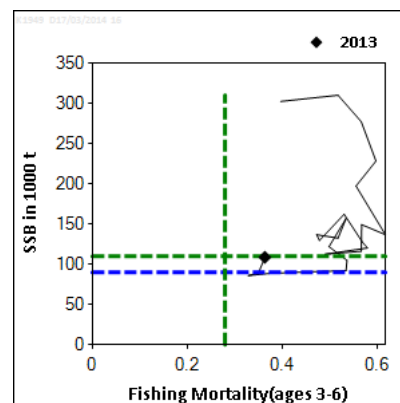
**ECOREGION** North Sea  
**STOCK** Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners)

**Advice for 2015**

ICES advises on the basis of the MSY approach that wanted catch<sup>1</sup> in 2015 should be no more than 44 439 tonnes. The resulting total catch cannot be quantified as discard data are not fully available. This advice applies to the wanted catch of western Baltic spring spawners in Divisions IVa east, IIIa, and Subdivisions 22–24.

**Stock status**

	Fishing pressure			
	2011	2012	2013	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
	Stock size			
	2012	2013	2014	
MSY ( $B_{trigger}$ )	✗	✗	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	○	✓	Full reproductive capacity



**Figure 6.3.8.1** Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). Summary of stock assessment (predicted values are shown in grey). Top right: SSB and F for the time-series used in the assessment.

SSB reached the lowest point in the time-series in 2011 and is above MSY  $B_{trigger}$  in 2014. Fishing mortality has been at its lowest in the recent years, but was still above  $F_{MSY}$  in 2013. The stock appears to remain in a low production period.

**Management plans**

A management strategy for the TAC-setting procedure in Division IIIa was agreed by the European Union and Norway in March 2014, which should be advice-based and account for status and development of both stocks (western Baltic spring spawners (WBSS) and North Sea autumn spawners (NSAS)). ICES has not evaluated this strategy and therefore does not advise on it.

<sup>1</sup> “Wanted catch” is used to describe fish that would be landed in the absence of the EU landing obligation. The “unwanted catch” refers to the component that was previously discarded.

## Biology

In the summer, herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners, WBSS) migrate, in search of food, from the western Baltic into the more saline waters of Division IIIa and the eastern parts of Division IVa. In these areas they mix with North Sea autumn-spawning (NSAS) herring. In recent years, mixing has also been detected between WBSS and central Baltic herring in Subdivisions 24–26. Herring is considered to have a major impact on other fish stocks as a predator and as prey for other species, including commercial fish species, seabirds, and marine mammals.

## Environmental influence on the stock

The reasons for the reduced recruitment since 2006 are unknown. There are no indications of systematic changes in growth or age-at-maturity, and reduced recruitment is likely due to increased mortality at the egg or larval stage. Specific research efforts are required to identify the causes of poor recruitment.

## The fisheries

Of the total catch, 12% is taken with passive gear (mainly gillnets), which is only used in Subdivisions 22–24. The remaining 88% is taken by active gear (mainly pelagic trawl). No quantitative discard information was reported to ICES within the data submission cycle in 2014. However, for two fisheries (active and passive) from Germany that land about a quarter of the annual WBSS catch it is reported that no discards have been detected by observers or harbour sampling programmes. There are indications that discarding and/or slipping of herring in the sprat fishery may have increased in recent years; however, the amount cannot be quantified. Nevertheless, the herring bycatch ceiling for these fleets was not reached in recent years and it appears unlikely that the potential discarding and/or slipping is higher than the bycatch ceiling. Misreporting by the C-fleet in Division IIIa is assumed to have ceased since 2009 due to national regulations.

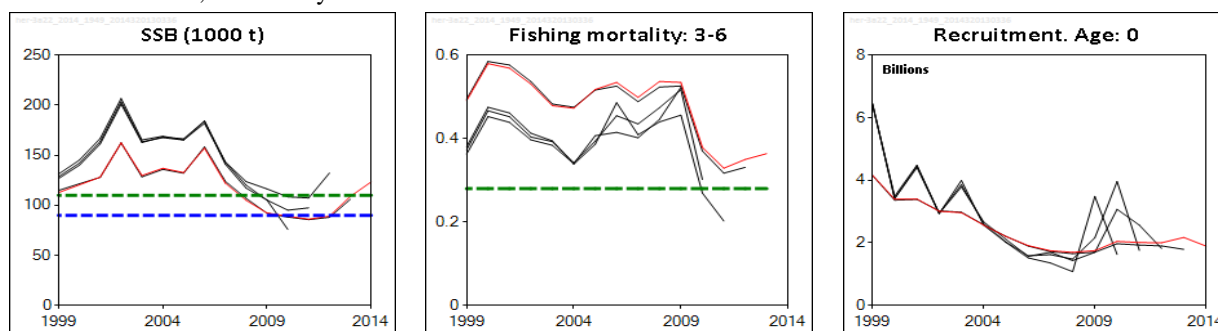
## Catch distribution

Area where WBSS are caught	Fleet	Fishery	WBSS 2013 landings	NSAS 2013 landings
Division IIIa	C*	Directed herring fisheries with purse-seiners and trawlers.	16 597 t	11 768 t
	D*	Bycatches of herring caught in the small-mesh fisheries.	1 277 t	1 599 t
Subdivisions 22–24	F*	All herring fisheries in Subdivisions 22–24.	25 504 t	-
Division IVa East	A	Directed herring fisheries with purse-seiners and trawlers.	452 t	-

\*Total discards cannot be quantified.

## Quality considerations

The inherent uncertainty in the predictions is related to the lack of a firm basis to predict the proportions of NSAS and WBSS herring in the catches taken in Division IIIa and IVaEast, arising from the natural variation in migration patterns and the variation in the distribution of the fishery between years (due, inter alia, to the optional transfer of quotas between Divisions IIIa and IV). There is increased mixing of WBSS herring and herring from the central Baltic in the Subdivisions 22–24, which may bias the assessment.



**Figure 6.3.8.2** Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). Historical assessment results (final-year recruitment estimates included). The stock was benchmarked in 2013.

## Scientific basis

<b>Stock data category</b>	1 (ICES, 2014a)
<b>Assessment type</b>	Age-based analytical assessment (SAM).
<b>Input data</b>	Two acoustic, two trawl, and one larval survey indices (HERAS, GerAS (BIAS), IBTS Q1, IBTS Q3, and N20). Catch statistics and corrections for historical area misreporting. Otolith microstructure and morphometric methods to calculate the proportion of NSAS in the catches.
<b>Discards and bycatch</b>	Discard information is incomplete and thus total discards cannot be quantified.
<b>Indicators</b>	None.
<b>Other information</b>	Last benchmarked in 2013 (ICES, 2013).
<b>Working group report</b>	Herring Assessment Working Group for the Area South of 62°N (HAWG; ICES, 2014b).

**ECOREGION** North Sea  
**STOCK** Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners)

**Reference points**

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

(Last changed in: 2013)

**Outlook for 2015**

Basis (for Western Baltic spring-spawning herring, WBSS): Intermediate year (2014) having a TAC constraint with optional quota transfer.  $R_{2013-2015} = GM_{(2008-2012)} = 1\,894$  million; catch (2014) = unknown; landings (2014) = 37 272 t<sup>1</sup>. Landings are for all WBSS herring in Division IIIa, Division IVa East, and Subdivisions 22–24<sup>1</sup>. The expected landings of WBSS by fleet in 2014 are:

F total	Wanted catch total	Wanted catch fleet A <sup>2</sup>	Wanted catch fleet C	Wanted catch fleet D	Wanted catch fleet F	SSB 2014
0.364	37 272 <sup>a</sup>	452	15 936	1 130	19 754	123 335

For more information about expected wanted catch of North Sea autumn-spawning herring (NSAS) see Section 6.3.9.

Rationale	Wanted catch (2015)	Basis	F Wanted catch (2015)	SSB (2015) <sup>3</sup>	SSB (2016) <sup>3</sup>	% SSB <sup>4</sup> change	% advice <sup>5</sup> change
MSY approach	44 439	$F_{\text{MSY}}$ $F(2014) * 0.806$	0.28	142 776	154 936	9%	+7%
Zero catch	0	$F(2014) \times 0$	0	146 652	199 498	36%	–100%
Other options	48 987	$F(2014) \times 0.9$	0.31	142 330	150 502	6%	+18%
	53 679	$F(2014) \times 1$	0.35	141 858	145 955	3%	+29%
	58 237	$F(2014) \times 1.1$	0.38	141 388	141 563	0%	+40%

Weights in thousand tonnes.

<sup>a</sup> Assuming a utilization in 2014 of the WBSS part of the TAC/bycatch ceiling of 100% (human consumption fishery-F-fleet in SDs 22–24), 55% (human consumption fishery, C-fleet), and 54% (small-meshed industrial fishery, D-fleet).

<sup>1</sup> The ratio between the different herring stocks in Division IIIa is based on the average proportions in the landings 2011–2013. However, they cannot be predicted and may therefore deviate significantly from the assumed ratio.

<sup>2</sup> As for 2013 a catch of 452 t WBSS herring taken in the transfer area in Division IVa East is assumed for 2014 and 2015. The amount of this catch is highly variable since it is dependent on the geographical distribution of the stock components in Division IVa East.

<sup>3</sup> For spring-spawning stocks, the SSB is determined at spawning time and is influenced by fisheries between 1<sup>st</sup> January and spawning time.

<sup>4</sup> SSB (2015) relative to SSB (2016).

<sup>5</sup> Wanted catch 2015 relative to ICES advice 2014 for the western Baltic spring-spawning herring stock.

## ***MSY approach***

Following ICES MSY approach implies a fishing mortality reduced to 0.28 in 2015, which results in wanted catches of no more than 44 439 t in 2015 from the whole distribution area. This is expected to lead to an SSB of 155 000 t in 2016. ICES cannot quantify catches as there is insufficient information available to determine the extent of discarding that may be taking place.

## ***Management plans***

There is no management plan for the entire stock, but a management strategy was adopted for the human consumption fishery in Division IIIa, which is a part of the distribution area of this stock (EU–Norway, 2014). According to this rule, the TAC for Division IIIa (C-fleet) is calculated from the sum of 3.5% of the agreed TAC (A-fleet) based on the 2014 NSAS long-term management plan (LTMP) and 41% of the MSY-based ICES advice on WBSS. For 2015, this translates into 33 807 t (3.5% of 445 329 t = 15 587 t plus 41% of 44 439 t = 18 220 t). However, the variation of the TAC between years is limited to  $\pm 15$ . A 15% reduction of 46 750 t (2014 TAC) is 39 738<sup>1</sup> tonnes.

The Division IIIa TAC rule implies that 50% of the advised MSY catch from the WBSS is set as TAC for SDs 22–24 (22 220 t).

ICES has not evaluated the rule and therefore continues to advise on the MSY approach.

## **Additional considerations**

### ***Management considerations***

The importance of developing a robust long-term management plan (LTMP) for the WBSS herring has been emphasized by ICES in recent years' advice. The LTMP should take account of variable distribution of the WBSS herring stock in three different management areas, SDs 22–24, Division IIIa, and Division IVa-East, as well as the mixing with adjacent herring stocks within these areas.

In 2013 an EU–Norway expert group on Management Measures for Herring in ICES Division IIIa (Skagerrak and Kattegat) (EU–Norway, 2013) suggested a management strategy for setting the TAC for human consumption catches of herring in Division IIIa. The EU and Norway in 2014 (EU–Norway, 2014) agreed on this management strategy with an additional TAC constraint of  $\pm 15$ % to set the TAC for the C-fleet in 2014 and the following four years. The management strategy has not been evaluated by ICES.

Management measures that include an optional quota transfer from Division IIIa to be caught in the North Sea have reduced F after 2009; however, F is still above  $F_{MSY}$ . Although F increased in 2013 in relation to 2012, it was lower than anticipated in last year's advice, which is explained by a lower than expected share of the TAC taken by the fishery in Division IIIa.

The fastest growing adults from the WBSS herring mixes with the much larger NSAS herring stock in Division IVaE. The amount of mixing is variable from year to year and estimated with high uncertainty. If herring catches substantially increase in Division IVaE, taken under either NS or WBSS TACs, the risk of overexploiting the WBSS stock increases. WBSS is the stock in most need of protection at the moment and, therefore, exploitation in this mixing area should not increase.

The indication of an unaccounted central Baltic herring component in the catches from Subdivision 24 likely leads to additional uncertainty in the estimation of fishing pressure on the stock. The potential mixing with other herring stocks in the western Baltic should be considered in future assessment and management.

### ***Information from the fishing industry***

In recent years, fisheries regulations allowed 50% of the TAC for Division IIIa to be caught in the North Sea. ICES notes that the present flexibility in taking a proportion of the Division IIIa TAC in the North Sea introduces additional uncertainties in the forecasts. The intermediate year forecast for 2014 for both WBSS and NSAS herring is based on an assumption by the Pelagic RAC that the optional transfer of quotas in 2014 from Division IIIa to the North Sea is 45%.

Reports from the fishing industry indicates an increasing problem with high bycatch fractions of herring in the sprat fishery in Division IIIa, resulting in discarding of hauls (i.e. slipping).

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<sup>1</sup> Value was corrected in July (04-07-2014).

### *Uncertainties in the assessment and forecast*

The main causes for uncertainty in predictions are: lack of a firm basis to predict the fraction of NSAS in the catches in the Kattegat and Skagerrak, and the distribution of the fishery between years. The 2013 advice assumed a 40% transfer of the C-fleet quota from Division IIIa to the North Sea. With an actual transfer of 48%, forecasts are considered relatively precise; however, ICES does not consider that quota transfer can be predicted more than one year ahead and ICES present advice assumes that no quota transfer will take place in 2015. The inherent uncertainty in predictions could be reduced by eliminating the optional transfer of quotas between Division IIIa and Subarea IV. Estimation of stock identity of herring from the transfer area in Division IVa East should be improved.

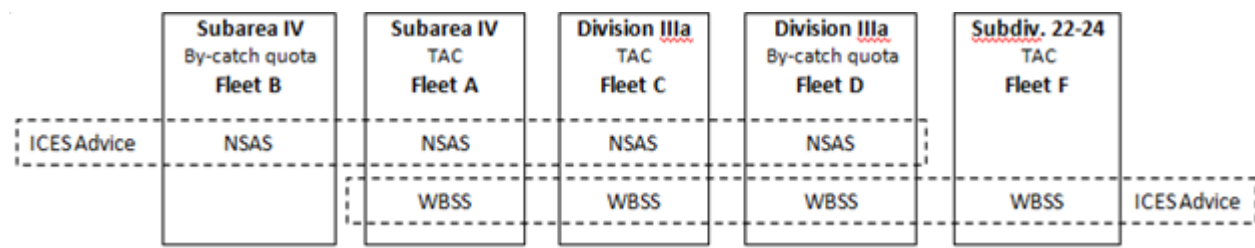
### *Comparison of the basis of previous assessment and advice*

The basis for the assessment has not changed from last year. The basis for the advice this year is the same as last year: the MSY approach. Given that discards and/or slipping cannot be quantified this year's advice is based on wanted catch.

### **Assessment and management area**

Catch options are provided for the whole stock of WBSS within its distribution area. In the mixing area in Division IIIa, catches of WBSS herring in Division IIIa also include catches of North Sea autumn-spawning (NSAS) herring which have been estimated and provided for catch options for NSAS herring (Section 6.3.9).

ICES advises on catch options for the entire distribution of the two herring stocks separately. However, the fisheries are managed by areas covering the geographical distribution of the stocks (see the following text diagram).



The calculation of the intermediate year (2014) catch is based on:

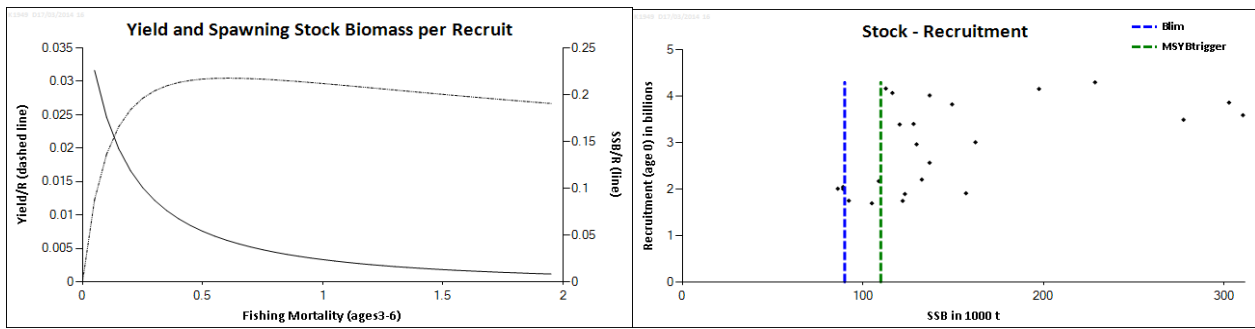
1. The TACs fixed for the A- and F-fleets and the bycatch ceiling fixed for the D-fleet for 2014.
2. The 2011–2013 patterns of the proportion of the two stocks in landings of the different fleets (WBSS amounts to 62% in the C-fleet, 31% in the D-fleet, and 100% in the F-fleet).
3. A transfer of 45% of the Division IIIa C-fleet quotas to be taken in the North Sea and a 54.4% utilization of the bycatch quota in the D-fleet.
4. Landings of 452 t of WBSS taken by the A-fleet in Division IVa East in 2014. These landings of WBSS herring are taken under the North Sea TAC in the transfer area in Division IVaE and thus not restricted by the TAC set for WBSS.

The outlook options for 2015 are based on expected landings in 2014 of 37 272 t of the western Baltic spring-spawning stock, including a catch of 452 t of WBSS in Division IVa East.

### **Sources**

- EU–Norway. 2013. Report from the Working Group on Management Measures for Herring in ICES Division IIIa (Skagerrak and Kattegat), Bergen, 19–20 June 2013.
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- ICES. 2007. Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG), 13–22 March 2007, ICES Headquarters. ICES CM 2007/ACFM:11.
- ICES. 2010. Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG), 15–23 March 2010, ICES Headquarters. ICES CM 2012/ACOM:06.
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- ICES. 2013a. Report of the Benchmark Workshop on Pelagic Stocks (WKPELA 2013), 4–8 February 2013, Copenhagen, Denmark. ICES CM 2013/ACOM:46. 483 pp.
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ICES. 2014a. Advice basis. *In* Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.2.  
 ICES. 2014b. Report of the Herring Assessment Working Group for the Area South of 62°N, 11–20 March 2014. ICES CM 2014/ACOM:06.



**Figure 6.3.8.3** Herring in Division IIIa and Subdivisions 22–24 (Western Baltic spring spawners). Yield-per-recruit analysis and stock recruitment plots.

**Table 6.3.8.1** Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES advice, management, and catches.

Year	ICES Advice	Pred. catch corresp. to advice	Agreed TAC IIIa <sup>2</sup>	ICES catch of Stock			
				22–24	IIIa	IV	Total
1987	Reduction in F	224	218	102	59	14	175
1988	No increase in F	196	218	99	129	23	251
1989	TAC	174	218	95	71	20	186
1990	TAC	131	185	78	118	8	204
1991	TAC	180	155	70	112	10	192
1992	TAC	180	174	85	101	9	195
1993	Increased yield from reduction in F; reduction in juvenile catches	188	210	81	95	10	186
1994	TAC	130–180	191	66	92	14	172
1995	If required, TAC not exceeding recent catches	168–192	183	74	80	10	164
1996	If required, TAC not exceeding recent catches	164–171	163	58	71	1	130
1997	IIIa: managed together with autumn spawners 22–24: if required, TAC not exceeding recent catches	66–85 <sup>a</sup>	100	68	55	1	124
1998	Should be managed in accordance with NSAS	-	97	51	53	8	112
1999	IIIa: managed together with autumn spawners 22–24: if required, TAC not exceeding recent catches	-	99	50	43	5	98
2000	IIIa: managed together with autumn spawners 22–24: if required, TAC not exceeding recent catches	~60 for Subdivisions 22–24	101	54	57	7	118
2001	IIIa: managed together with autumn spawners 22–24: if required, TAC not exceeding recent catches	~50 for Subdivisions 22–24	101	64	42	6	112
2002	IIIa: managed together with autumn spawners 22–24: if required, TAC not exceeding recent catches	~50 for Subdivisions 22–24	101	53	47	7	107
2003	Reduce F	< 80	101	40	36	2	78
2004	Separate management regime. Reduce F	< 92	91	42	24	7	77
2005	Separate management regime. <i>Status quo</i> F	95	120	44	38	7	89
2006	Separate management regime. <i>Status quo</i> F	95	102 <sup>b</sup> /47.5 <sup>c</sup>	42	36	11	89
2007	Separate management regime. <i>Status quo</i> F	99	69 <sup>b</sup> /49.5 <sup>c</sup>	40	28	1	68
2008	Separate management regime. Reduce F 20% towards F <sub>0.1</sub>	71	51.7 <sup>b</sup> /45 <sup>c</sup>	43	25	0	68
2009	Separate management regime. Reduce F to F = 0.25	< 32.8	37.7 <sup>b</sup> /27.2 <sup>c</sup>	31	32	4	67
2010	Separate management regime. Reduce F to F = 0.25	< 39.8	33.9 <sup>b</sup> /22.7 <sup>c</sup>	18	24	1	42
2011	MSY transition in 1–5 years and no increase in catches of WBSS herring in the North Sea	26.5–53.6	30 <sup>b</sup> /15.8 <sup>c</sup>	16	12	0.3	28
2012	F <sub>MSY</sub> = 0.25 and no increase in catches of WBSS herring in the North Sea	< 42.7	45 <sup>b</sup> /20.9 <sup>c</sup>	21	15	2	39
2013	F <sub>MSY</sub> = 0.25 and no <i>optional</i> transfer of catch options to the North Sea	< 51.9	55 <sup>b</sup> /25.8 <sup>c</sup>	26	17	0.5	44
2014	Transition to MSY approach	< 41.602	46.8 <sup>b</sup> /19.8 <sup>c</sup>				
2015	MSY approach (F <sub>MSY</sub> = 0.28) <sup>d</sup>	< 44.439					

Weights in thousand tonnes.

<sup>a</sup> Catch in Subdivisions 22–24.

<sup>b</sup> Human consumption in Division IIIa, not including industrial bycatch or mixed clupeoids, but including North Sea autumn-spawner catch in fleet C, with an optional 50% transfer from Division IIIa to Subarea IV since 2011.

<sup>c</sup> Separate TAC for Subdivisions 22–24.

<sup>d</sup> Advice for 2015 is given for wanted catch.

\* Including mixed clupeoid TAC and bycatch ceiling in small-mesh fishery.

Table 6.3.8.2

Herring in Subdivisions 22–24 and Division IIIa (spring and autumn spawners). ICES landings (thousand tonnes) by area and country.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 <sup>2</sup>	1999 <sup>2</sup>
<b>Skagerrak</b>											
Denmark	47.4	62.3	58.7	64.7	87.8	44.9	43.7	28.7	14.3	10.3	10.1
Faroe Islands											
Germany											
Lithuania											
Norway	1.6	5.6	8.1	13.9	24.2	17.7	16.7	9.4	8.8	8.0	7.4
Sweden	47.9	56.5	54.7	88.0	56.4	66.4	48.5	32.7	32.9	46.9	36.4
<b>Total</b>	<b>96.9</b>	<b>124.4</b>	<b>121.5</b>	<b>166.6</b>	<b>168.4</b>	<b>129.0</b>	<b>108.9</b>	<b>70.8</b>	<b>56.0</b>	<b>65.2</b>	<b>53.9</b>
<b>Kattegat</b>											
Denmark	57.1	32.2	29.7	33.5	28.7	23.6	16.9	17.2	8.8	23.7	17.9
Sweden	37.9	45.2	36.7	26.4	16.7	15.4	30.8	27.0	18.0	29.9	14.6
<b>Total</b>	<b>95.0</b>	<b>77.4</b>	<b>66.4</b>	<b>59.9</b>	<b>45.4</b>	<b>39.0</b>	<b>47.7</b>	<b>44.2</b>	<b>26.8</b>	<b>53.6</b>	<b>32.5</b>
<b>Sub. Div. 22+24</b>											
Denmark	21.7	13.6	25.2	26.9	38.0	39.5	36.8	34.4	30.5	30.1	32.5
Germany	56.4	45.5	15.8	15.6	11.1	11.4	13.4	7.3	12.8	9.0	9.8
Poland	8.5	9.7	5.6	15.5	11.8	6.3	7.3	6.0	6.9	6.5	5.3
Sweden	6.3	8.1	19.3	22.3	16.2	7.4	15.8	9.0	14.5	4.3	2.6
<b>Total</b>	<b>92.9</b>	<b>76.9</b>	<b>65.9</b>	<b>80.3</b>	<b>77.1</b>	<b>64.6</b>	<b>73.3</b>	<b>56.7</b>	<b>64.7</b>	<b>49.9</b>	<b>50.2</b>
<b>Sub. Div. 23</b>											
Denmark	1.5	1.1	1.7	2.9	3.3	1.5	0.9	0.7	2.2	0.4	0.5
Sweden	0.1	0.1	2.3	1.7	0.7	0.3	0.2	0.3	0.1	0.3	0.1
<b>Total</b>	<b>1.6</b>	<b>1.2</b>	<b>4.0</b>	<b>4.6</b>	<b>4.0</b>	<b>1.8</b>	<b>1.1</b>	<b>1.0</b>	<b>2.3</b>	<b>0.7</b>	<b>0.6</b>
<b>Grand Total</b>	<b>286.4</b>	<b>279.9</b>	<b>257.8</b>	<b>311.4</b>	<b>294.9</b>	<b>234.4</b>	<b>231.0</b>	<b>172.7</b>	<b>149.8</b>	<b>169.4</b>	<b>137.2</b>

Year	2000	2001 <sup>5</sup>	2002 <sup>4</sup>	2003	2004	2005	2006 <sup>3,6</sup>	2007	2008	2009	2010	2011	2012	2013 <sup>1</sup>
<b>Skagerrak</b>														
Denmark	16.0	16.2	26.0	15.5	11.8	14.8	5.2	3.6	3.9	12.7	5.3	3.6	3.2	4.9
Faroe Islands						0.4			0.0	0.6	0.4			
Germany				0.7	0.5	0.8	0.6	0.5	1.6	0.3	0.1	0.1	0.6	0.2
Lithuania											0.4			
Norway	9.7							3.5	4.0	3.3	3.3	0.1	0.4	3.0
Sweden	45.8	30.8	26.4	25.8	21.8	32.5	26.0	19.4	16.5	12.9	17.4	9.5	16.2	16.7
<b>Total</b>	<b>71.5</b>	<b>47.0</b>	<b>52.3</b>	<b>42.0</b>	<b>34.1</b>	<b>48.5</b>	<b>31.8</b>	<b>26.9</b>	<b>26.0</b>	<b>29.7</b>	<b>27.0</b>	<b>13.2</b>	<b>20.5</b>	<b>24.8</b>
<b>Kattegat</b>														
Denmark	18.9	18.8	18.6	16.0	7.6	11.1	8.6	9.2	7.0	4.9	7.6	5.2	6.3	3.9
Sweden	17.3	16.2	7.2	10.2	9.6	10.0	10.8	11.2	5.2	3.6	2.7	1.7	0.8	2.6
Germany										0.6	0.0			
<b>Total</b>	<b>36.2</b>	<b>35.0</b>	<b>25.9</b>	<b>26.2</b>	<b>17.2</b>	<b>21.1</b>	<b>19.4</b>	<b>20.3</b>	<b>12.2</b>	<b>9.1</b>	<b>10.3</b>	<b>6.8</b>	<b>7.1</b>	<b>6.5</b>
<b>Sub. Div. 22+24</b>														
Denmark	32.6	28.3	13.1	6.1	7.3	5.3	1.4	2.8	3.1	2.1	0.8	3.1	4.1	5.1
Germany	9.3	11.4	22.4	18.8	18.5	21.0	22.9	24.6	<b>22.8</b>	16.0	12.2	8.2	11.2	14.6
Poland	6.6	9.3		4.4	5.5	6.3	5.5	2.9	5.5	5.2	1.8	1.8	2.4	3.1
Sweden	4.8	13.9	10.7	9.4	9.9	9.2	9.6	7.2	7.0	4.1	2.0	2.2	2.7	2.1
<b>Total</b>	<b>53.3</b>	<b>62.9</b>	<b>46.2</b>	<b>38.7</b>	<b>41.2</b>	<b>41.8</b>	<b>39.4</b>	<b>37.6</b>	<b>38.5</b>	<b>27.4</b>	<b>16.8</b>	<b>15.3</b>	<b>20.4</b>	<b>24.8</b>
<b>Sub. Div. 23</b>														
Denmark	0.9	0.6	4.6	2.3	0.1	1.8	1.8	2.9	5.3	2.8	0.1 <sup>6</sup>	0.03	0.04	0.04
Sweden	0.1	0.2		0.2	0.3	0.4	0.7		0.3	0.8	0.9	0.5	0.7	0.6
<b>Total</b>	<b>1.0</b>	<b>0.8</b>	<b>4.6</b>	<b>2.6</b>	<b>0.4</b>	<b>2.2</b>	<b>2.5</b>	<b>2.9</b>	<b>5.7</b>	<b>3.6</b>	<b>1.0</b>	<b>0.6</b>	<b>0.7</b>	<b>0.7</b>
<b>Grand Total</b>	<b>162.0</b>	<b>145.7</b>	<b>128.9</b>	<b>109.5</b>	<b>92.8</b>	<b>113.6</b>	<b>93.0</b>	<b>87.7</b>	<b>82.3</b>	<b>69.9</b>	<b>55.2</b>	<b>35.9</b>	<b>48.8</b>	<b>56.7</b>

<sup>1</sup> Preliminary data.

<sup>2</sup> Revised data for 1998 and 1999.

<sup>3</sup> 2000 tonnes of Danish landings are missing. See Section 3.1.2 in ICES (2007).

<sup>4</sup> The Danish national management regime for herring and sprat fishery in Subdivision 22 was changed in 2002.

<sup>5</sup> The total landings in Skagerrak have been updated for 1995–2001 due to Norwegian misreportings into Skagerrak.

<sup>6</sup> Official reported catches : 3103 tonnes, see Section 3.2.1 in ICES (2011).

**BOLD** = German revised data for 2008 (in ICES, 2010).



**Table 6.3.8.3**

Herring in Subdivisions 22–24 and Division IIIa (spring spawners). Summary of the assessment.

Year	Recruitment Age 0 thousands	*SSB tonnes	Landings Tonnes	Mean F Ages 3–6
1991	3863175	302852	191573	0.397
1992	3591211	310519	194411	0.518
1993	3492052	277618	185010	0.567
1994	4299460	228662	172438	0.598
1995	4155736	197600	150831	0.556
1996	4016816	137036	121266	0.618
1997	3824736	149492	115588	0.568
1998	4069375	116425	107032	0.567
1999	4164055	112758	97240	0.491
2000	3392237	120451	109914	0.58
2001	3402429	128156	105803	0.569
2002	3008644	162430	106191	0.531
2003	2963851	129832	78309	0.479
2004	2566362	137036	76815	0.473
2005	2204475	132720	88406	0.518
2006	1910738	157157	90549	0.535
2007	1746283	122149	68997	0.499
2008	1694672	105030	68484	0.537
2009	1749779	92319	67262	0.535
2010	2045187	89143	42214	0.379
2011	2008703	86163	27771	0.329
2012	2002686	89143	38648	0.35
2013	2171655	108880	43827	0.364
2014	**1894376	***123335		
Average	2926612	150704	102112	0.503

\* SSB measured at spawning time.

\*\* Recruitment is the geometric mean 2008–2012.

\*\*\*SSB is predicted.