

6.3.12 Herring (*Clupea harengus*) in Subarea IV and Divisions IIIa and VIId (autumn spawners) (North Sea, Skagerrak and Kattegat, Eastern English Channel)

ICES stock advice

ICES advises that when the European Union (EU)–Norway management plan is applied, catches in 2016 should be no more than 555 086 tonnes, including 518 242 t for the A-fleet.

ICES advises, under precautionary considerations, that activities that have a negative impact on the spawning habitat of herring should not occur, unless the effects of these activities have been assessed and shown not to be detrimental.

Stock development over time

Recruitment was below average between 2003 and 2013. Recruitment in 2014 is estimated to be strong and the 2015 recruitment is estimated to be low. Since 1996 the stock has fluctuated above B_{pa} and is now well above precautionary reference points. Fishing mortality has been below F_{MSY} since 1996.



Figure 6.3.12.1 Herring in Subarea IV and Divisions IIIa and VIId (autumn spawners). Commercial catches (upper left), and recruitment, fishing mortality, and spawning-stock biomass from the summary of stock assessment (predicted values are not shaded).

Stock and exploitation status

Table 6.3.12.1 Herring in Subarea IV and Divisions IIIa and VIId. State of the stock and fishery, relative to reference points.

	Fishing pressure			Stock size			
		2012	2013	2014	2013	2014	2015
Maximum Sustainable Yield	F_{MSY}	✓	✓	✓ Appropriate	$MSY_{B_{trigger}}$?	?
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa} , B_{lim}	✓	✓ Full reproductive capacity
Management Plan	F_{MGT}	✓	✓	✓ Below limit	SSB_{MGT}	✓	✓ Above trigger
							?
							Undefined

Catch options

Table 6.3.12.2 Herring in Subarea IV and Divisions IIIa and VIId (autumn spawners). The basis for the catch options.

Variable	Value	Source	Notes
$F_{ages(wr) 2-6}$ (2015)	0.21	ICES (2015a)	Catch constraint
SSB (2015)	2 193 873 t	ICES (2015a)	
$R_{age(wr)0}$ (2015)	17 billion	ICES (2015a)	
$R_{age(wr)0}$ (2016)	33 billion	ICES (2015a)	Geometric mean over 2004–2014.
Total catch (2015)	492 073 t	ICES (2015a)	Agreed catch options with 46% transfer of C-fleet TAC to the North Sea.

Table 6.3.12.3 Herring in Subarea IV and Divisions IIIa and VIId (autumn spawners). The intermediate year (2015) assumptions. Weights in tonnes.

F A-fleet	F B-fleet	F C-fleet	F D-fleet	$F_{ages(wr) 2-6}$	$F_{ages(wr) 0-1}$	Catches A-fleet*	Catches B-fleet	Catches C-fleet	Catches D-fleet	SSB 2015
0.21	0.023	0.002	0.008	0.21	0.04	462 434	15 744	8 961	4 934	2 193 873

* Includes a transfer of 2953 t of the Norwegian quota and 46% of Division IIIa TAC from the C-fleet to the A-fleet.

Table 6.3.12.4 Herring in Subarea IV and Divisions IIIa and VIId (autumn spawners). Catch options for the prediction year (2016) for NSAS herring. All weights are in tonnes.

Basis	F values by fleet and total							Catches by fleet				Biomass*			
	A-fleet	B-fleet	C-fleet	D-fleet	$F_{ages(wr) 2-6}$	$F_{ages(wr) 0-1}$	A-fleet	B-fleet	C-fleet	D-fleet	SSB 2016	SSB 2017**	%SSB change ***	%TAC change A-fleet ****	
1 Management plan [§]	0.23	0.034	0.003	0.006	0.24	0.05	518 242	12 498	19 412	4 934	2 680 652	2 303 753	+22	+16	
2 F_{MSY}	0.26	0.034	0.004	0.006	0.27	0.05	589 360	12 498	19 968	4 934	2 632 220	2 167 987	+20	+32	
3 No fishing	0.00	0.000	0.000	0.000	0.00	0.00	0	0	0	0	3 039 767	3 060 322	+39	-100	
4 No change in TAC	0.19	0.034	0.003	0.006	0.20	0.05	445 329	12 498	16 570	4 934	2 731 622	2 362 605	+25	0	
5 TAC increase of 15%	0.22	0.034	0.003	0.006	0.23	0.05	512 128	12 498	19 055	4 934	2 685 034	2 269 797	+22	+15	
6 TAC reduction of 15%	0.16	0.034	0.002	0.006	0.17	0.05	378 530	12 498	14 084	4 934	2 777 841	2 457 599	+27	-15	

* For autumn-spawning stocks, the SSB is determined at spawning time and is influenced by fisheries between 1st January and spawning.

** Assuming same catch option in 2017 as in 2016.

*** SSB (2016) relative to SSB (2015).

**** Calculated catches (2016) relative to TAC 2015 for the A-fleet.

[§] For the management plan option, the A-fleet catches are calculated to achieve target F_{2-6} , and the B-fleet catches are then calculated to achieve the target F_{0-1} . The C-fleet TAC was based on 41% of the ICES MSY advice for western Baltic spring-spawning (WBSS) herring, plus 5.7% of the North Sea autumn-spawning (NSAS) herring TAC of the A-fleet. The management plan included catch and F stabilizers that influence the target F, which gives $F = 0.24$ and not the overall target $F = 0.26$.

Table 6.3.12.5 Herring in Subarea IV and Divisions IIIa and VIId (autumn spawners).and herring in Division IIIa and Subdivisions 22–24 (spring spawners): the advised catch and resulting catch options by fleet following the agreed EU–Norway management rule. With North Sea LTMP and WBSS $F = 0.28$ and $F = F_{MSY} = 0.32$, and with 0% and 50% TAC transfer flexibility. All weights are in thousand tonnes. Additional scenarios are available upon request.

	Fishing mortality			TACs and catch by fleet									
	NSAS $F_{ages(wr)2-6}$	NSAS $F_{ages(wr)0-1}$	WBSS $F_{ages(wr)3-6}$	A-fleet		B-fleet	C-fleet		D-fleet		Fleet F	Total catch	
Area	All	All	All	IV & VIId		IV & VIId	IIIa		IIIa		22–24	NSAS	WBSS
Area TAC (LTMP, $F_{MSY} = 0.32$)	0.234	0.05	0.35	518 242		12 498	51 084		6 659		26 274	555 086	52 547
Stock	NSAS $F_{ages(wr)2-6}$	NSAS $F_{ages(wr)0-1}$	WBSS $F_{ages(wr)3-6}$	NSAS	WBSS	NSAS	NSAS	WBSS	NSAS	WBSS	WBSS	NSAS	WBSS
Predicted catch 0% transfer	0.234	0.05	0.35	518 242	2 953	12 498	19 412	31 672	4 934	1 725	26 274	555 086	62 624
Predicted catch 50% transfer	0.244	0.05	0.27	543 784	2 953	12 498	9 706	15 836	4 934	1 725	26 274	570 922	46 788
Area TAC (LTMP, $F = 0.28$)	0.234	0.05	0.32	518 662		12 556	48 724		6 659		23 367	554 667	46 733
Stock	NSAS $F_{ages(wr)2-6}$	NSAS $F_{ages(wr)0-1}$	WBSS $F_{ages(wr)3-6}$	NSAS	WBSS	NSAS	NSAS	WBSS	NSAS	WBSS	WBSS	NSAS	WBSS
Predicted catch 0% transfer	0.234	0.05	0.32	518 662	2 953	12 556	18 515	30 209	4 934	1 725	23 367	554 667	58 254
Predicted catch 50% transfer	0.244	0.05	0.24	543 024	2 953	12 556	9 258	15 105	4 934	1 725	23 367	569 772	43 150

The TAC-setting procedure for the C-fleet in Division IIIa with $F = 0.28$ has been evaluated to be precautionary for WBSS herring, provided an optional quota transfer of greater than 10% (ICES, 2015b) is implemented. The same rule assuming $F_{MSY} = 0.32$ for WBSS has not been evaluated by ICES; however, the evaluations carried out do not indicate that this influences precautionary considerations for NSAS.

Basis of the advice

Table 6.3.12.6 Herring in Subarea IV and Divisions IIIa and VIId. The basis of the advice.

Advice basis	EU–Norway Management strategy
Management plan	Herring in this area is managed by a joint EU-Norway Management Strategy (EU–Norway, 2014).

Quality of the assessment

Input data from sampling and monitoring programmes are considered to be of good quality. Both the spawning-stock biomass and the fishing mortality are reliably estimated by the stock assessment.

Based on consistent observations in different surveys, the recruitment in 2014 is confirmed to be strong and the highest recorded since the onset of a poor recruitment period since 2003.

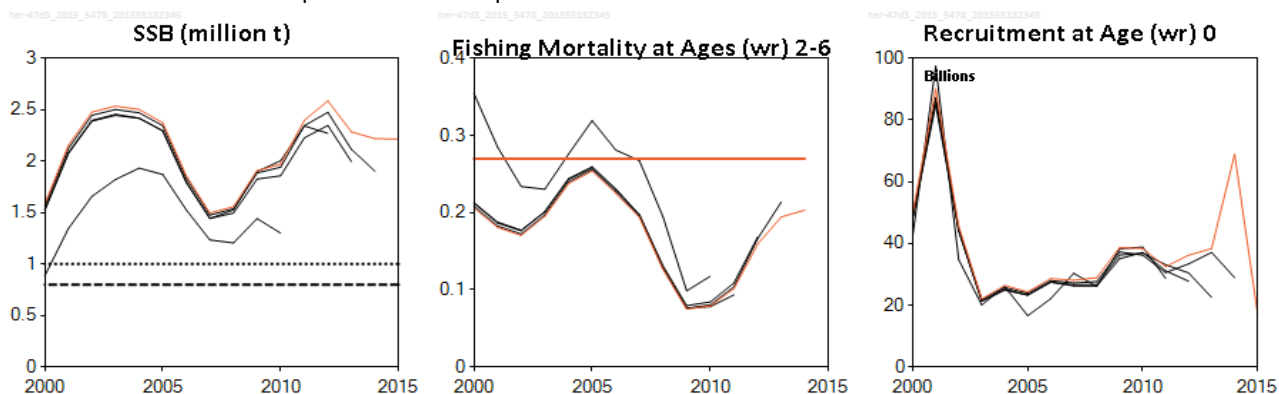


Figure 6.3.12.2 Herring in Subarea IV and Divisions IIIa and VIId. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

The advice for the B-fleet catches of NSAS herring is tightly linked to the TAC-setting procedure for herring in Division IIIa due to stock mixing.

There is a management decision to transfer a certain percentage (up to 50%) of herring TAC from Division IIIa to the North Sea, which is not fixed in the Division IIIa TAC-setting procedure. Evaluations have shown that catches can only be precautionary for WBSS herring if that transfer is at least 10%.

Under the EU landing obligation, which entered into force in 2015, up to 9% inter-species quota transfers are allowed for stocks that are considered to be within safe biological limits (see Article 15 of EU, 2013). Quota transfers were not considered in this catch advice as no information regarding these transfers was available. This should be monitored closely to ensure that catches of herring do not increase above the ICES advised catch. To achieve F_{MSY} exploitation, any transfer under this regulation should be accounted for in setting the TAC.

NSAS herring has several spawning components, including the Downs herring which spawns in Divisions IVc and VIId. These components are fished on individual spawning grounds and in a mixed-component fishery in the central and northern North Sea. Only the Downs component is caught in the southern North Sea. Sub-TACs have been set for Divisions IVc and VIId and for the remainder of the area to help protect these components; such measures should be continued to give protection to the different components. To ensure a total production of the stock, all populations within the stock must be protected under the long-term management plan.

Activities that have a negative impact on the spawning habitat of herring should not occur, unless the effects of these activities have been assessed and shown not to be detrimental (ICES, 2003, 2015c).

Reference points

Table 6.3.12.7 Herring in Subarea IV and Divisions IIIa and VIId. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	Not defined		
	F_{MSY}	0.27 [0.24–0.3]	Stochastic simulations with Beverton & Holt and Ricker stock–recruitment curve.	ICES (2012)
Precautionary approach	B_{lim}	800 000 t	< 0.8 million t; poor recruitment has been experienced.	ICES (2012)
	B_{pa}	1 000 000 t	$B_{pa} = B_{lim} \times \exp(1.645 \times \sigma)$ with $\sigma \approx 0.20$, based on the average CV from the terminal year spawning-stock biomass from the SAM assessment.	ICES (2012)
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	SSB_{MGT}	800 000 t 1 500 000 t	Informed by simulations and chosen by managers.	EU–Norway (2014)
	F_{MGT}	$F_{ages(wr)0-1} = 0.05$ $F_{ages(wr)2-6} = 0.26$	SSB is greater than the SSB_{MGT} upper trigger of 1.5 million t (based on simulations).	EU–Norway (2014)
		$F_{ages(wr)0-1} = 0.05$ $F_{ages(wr)2-6} = 0.26 - (0.16 \times (1\,500\,000 - SSB) / 700\,000)$	SSB is between the SSB_{MP} triggers of 0.8 and 1.5 million t (based on simulations).	EU–Norway (2014)
		$F_{ages(wr)0-1} = 0.04$ $F_{ages(wr)2-6} = 0.10$	SSB is less than the SSB_{MP} lower trigger of 0.8 million t (based on simulations).	

Basis of the assessment

Table 6.3.12.8 Herring in Subarea IV and Divisions IIIa and VIId. The basis of the assessment.

ICES stock data category	1 (ICES, 2015d)
Assessment type	Age-based analytical assessment (SAM; ICES, 2015a) that uses catches in the model and in the forecast.
Input data	Commercial catches and four survey indices (IBTS Q1 1-ringer, IBTS0, SCAI, HERAS), annual maturity data from HERAS survey, and natural mortalities from SMS North Sea multispecies model.
Discards and bycatch	Considered to be negligible.
Indicators	None.
Other information	The last benchmark for this stock occurred in 2012.
Working group	Herring Assessment Working Group for the Area South of 62°N (HAWG)

Information from stakeholders

Stakeholders contributed to the mapping of North Sea herring spawning areas (ICES, 2015c). The data compilation and mapping is ongoing.

History of advice, catch, and management

Table 6.3.12.9 Herring in Subarea IV and Divisions IIIa and VIId. History of ICES advice, the agreed TAC, and ICES estimates of landings. All weights are in thousand tonnes.

Year	ICES advice	Predicted catch corresponding to advice	Agreed TAC*	Bycatch ceiling B-fleet	ICES landings in IV, VIId #	ICES catch in IV, VIId ##	ICES catch autumn spawners IIIa, IV, VIId
1987	TAC	610	600		625	625	792
1988	TAC	515	530		710	710	888
1989	TAC	514	514		669	717	787
1990	TAC	403	415		523	578	646
1991	TAC	423	420		537	588	657
1992	TAC	406	430		518	572	716
1993	No increase in yield at $F > 0.3$	340	430		495	540	671
1994	No increase in yield at $F > 0.3$	346	440		463	498	571
1995	Long-term gains expected at lower F	429	440		510	516	579
1996	50% reduction of agreed TAC**	156	156***	44	207	233	275
1997	$F = 0.2$	159	159	24	175	238	264
1998	$F(\text{adult}) = 0.2, F(\text{juv}) < 0.1$	254	254	22	268	338	392
1999	$F(\text{adult}) = 0.2, F(\text{juv}) < 0.1$	265	265	30	290	333	363
2000	$F(\text{adult}) = 0.2, F(\text{juv}) < 0.1$	265	265	36	284	346	388
2001	$F(\text{adult}) = 0.2, F(\text{juv}) < 0.1$	See scenarios	265	36	296	323	363
2002	$F(\text{adult}) = 0.2, F(\text{juv}) < 0.1$	See scenarios	265	36	304	353	372
2003	$F(\text{adult}) = 0.25, F(\text{juv}) = 0.12$	See scenarios	400	52	414	450	480
2004	$F(\text{adult}) = 0.25, F(\text{juv}) = 0.1$	See scenarios	460	38	484	550	567
2005	$F(\text{adult}) = 0.25, F(\text{juv}) = 0.1$	See scenarios	535	50	568	639	664
2006	$F(\text{adult}) = 0.25, F(\text{juv}) = 0.12$	See scenarios	455	43	490	511	515
2007	Bring SSB above B_{pa} by 2008	See scenarios	341	32	361	388	407
2008	$F(\text{adult}) = 0.17, F(\text{juv}) = 0.08$ (MP)	See scenarios	201	19	228	245	258
2009	Adopt one of the new proposed HCRs	See scenarios	171	16	167	166	168
2010	$F(\text{adult}) = 0.15, F(\text{juv}) = 0.05$ (MP)	See scenarios	164	14	175	175	188
2011	See scenarios	See scenarios	200	16	218	218	226
2012	2008 Management plan	See scenarios	405	18	425	425	435
2013	2008 Management plan	See scenarios	478	14	498	498	511
2014	2008 Management plan	See scenarios	470	13	504	508	517
2015	2008 Management plan	See scenarios	445	16			
2016	2014 Management strategy	555.086					

* Catch in directed fishery in Subarea IV and Division VIId.

** Revision of advice given in 1995.

*** Revised in June 1996, down from 263.

Landings are provided by the working group and do not in all cases correspond to official statistics.

ICES catch includes unallocated and misreported landings, discards, and slipping.

History of catch and landings

Table 6.3.12.10 Herring in Subarea IV and Divisions IIIa and VIId. Catch distribution by fleet and area in 2014 as estimated by ICES.

Area where NSAS are caught	Fleet	Fishery	NSAS 2014 catches
North Sea fisheries	A	Directed herring fisheries	490 kt
	B	Bycatches of herring	14 kt
Division IIIa	C	Directed herring fisheries	10 kt
	D	Bycatches of herring	3 kt

Table 6.3.12.11 Herring in Subarea IV and Divisions IIIa and VIId. Total catch distribution in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings		Commercial discards
517 kt	97% directed fishery	3% bycatch	0.6 kt
	517 kt		

Table 6.3.12.12 Herring in Subarea IV and Divisions IIIa and VIId. History of commercial catch and landings of all stocks of herring caught in the North Sea. Catch in tonnes by country, 2005–2014. These figures do not in all cases correspond to the official statistics and cannot be used for legal purposes.

Country	2005	2006	2007	2008	2009
Belgium	6	3	1	-	-
Denmark *	128 380	102 322	84 697	62 864	46 238
Faroe Islands	738	1 785	2 891	2 014	1 803
France	38 829	49 475	24 909	30 347	18 114
Germany	46 555	40 414	14 893	8 095	5 368
Netherlands	81 531	76 315	66 393	23 122	24 552
Norway	156 802	135 361	100 050	59 321	50 445
Poland	458	-	-	-	-
Sweden	13 464	10 529	15 448	13 840	5 299
USSR/Russia	99	-	-	-	-
UK (England)	25 311	22 198	15 993	11 717	652
UK (Scotland)	73 227	48 428	35 115	16 021	14 006
UK (N. Ireland)	2 912	3 531	638	331	-
Unallocated landings	57 788	18 764	26 641	17 151	-726
Total landings	626 101	509 125	387 669	244 823	165 751
Discards	12 824	1 492	93	224	91
Total catch	638 925	510 617	387 762	245 047	165 842
Parts of the catches which have been allocated to spring-spawning stocks.					
WBSS	7 039	10 954	1 070	124	3 941
Thames estuary **	74	65	2	7	48
Norw. spring spawners ***	417	626	685	2 721	44 560
Country	2010	2011	2012	2013	2014
Belgium	-	4	3	14	27
Denmark *	45 869	58 726	105 707	117 367	124 423
Faroe Islands	3 014	-	-	-	118
France	17 745	16 693	23 819	30 122	29 679
Germany	7 670	9 427	24 515	46 922	36 767
Netherlands	23 872	34 708	72 344	80 462	74 647
Norway	46 816	60 705	119 253	143 718	142 002
Lithuania	90	-	-	-	9 830
Sweden	4 395	8 086	14 092	15 615	15 583
Ireland	-	-	-	221	68
UK (England)	10 770	11 468	25 346	19 079	19 287
UK (Scotland)	14 373	18 564	34 414	39 243	45 119
UK (N. Ireland)	-	17	4 794	5 738	6 612
Unallocated landings	-	-	321	-	3 292
Total landings	174 614	218 398	424 608	498 501	507 454
Discards	13	-	-	-	31
Total catch	174 627	218 398	424 608	498 501	507 485
Parts of the catches which have been allocated to spring-spawning stocks.					
WBSS	774	308	2 095	452	2 953
Thames estuary **	85	2	63	20	10
Norw. spring spawners ***	56 900	12 178	9 619	3 150	2 307

* Including any bycatches in the industrial fishery.

** Landings from the Thames estuary are included in the North Sea catch figure for UK (England).

*** These catches (including some local fjord-type spring spawners) are taken by Norway under a separate quota south of 62°N and are not included in the Norwegian North Sea catch figure for this area.

Table 6.3.12.13 Herring in Subarea IV and Divisions IIIa and VIId. History of commercial catch and landings of all stocks of herring caught in Division IVa West. Catch in tonnes by country, 2005–2014. These figures do not in all cases correspond to the official statistics and cannot be used for legal purposes.

Country	2005	2006	2007	2008	2009
Denmark *	80 990	60 462	45 948	28 426	16 550
Faroe Islands		580	1 118	2	288
France	13 474	18 453	8 570	13 068	7 067
Germany	22 278	18 605	4 985	498	-
Netherlands	36 619	39 209	42 622	11 634	11 017
Norway	66 232	38 363	40 279	40 304	25 926
Poland	458	-	-	-	-
Sweden	8 261	4 957	7 658	7 025	1 435
Russia	99	-	-	-	-
UK (England)	15 523	12 031	11 833	8 355	578
UK (Scotland)	71 941	47 368	35 115	14 727	10 249
UK (N. Ireland)	2 912	3 531	638	331	-
Unallocated landings **	39 324	10 981	22 215	14 952	-977
Total landings	358 111	253 048	220 981	139 322	72 133
Discards	10 861	1 492	93	194	91
Total catch	368 972	254 540	221 074	139 516	72 224
Country	2010	2011	2012	2013	2014
Denmark *	25 092	26 523	42 867	80 874	74 719
Faroe Islands	1 110	-	-	-	118
France	6 412	7 885	11 131	9 750	12 620
Germany	505	2 642	13 060	19 323	23 245
Netherlands	13 593	15 202	46 654	18 418	37 380
Norway	38 897	45 200	72 581	49 517	89 974
Lithuania	90	-	-	-	8 129
Sweden	2 310	5 121	6 065	12 280	7 760
Ireland	-	-	-	221	68
UK (England)	7 384	4 555	18 289	10 874	10 085
UK (Scotland)	13 567	17 909	33 352	37 889	41 844
UK (N. Ireland)	-	17	4 794	5 738	6 021
Unallocated landings **	0	0	-3 416	0	3 292
Total landings	108 960	125 054	245 377	244 884	315 255
Discards	13	-	-	-	31
Total catch	108 973	125 054	245 377	244 884	315 286

* Including any bycatches in the industrial fishery.

** May include misreported catch from Division VIaN and discards. Negative unallocated catches due to misreporting into other areas.

Table 6.3.12.14 Herring in Subarea IV and Divisions IIIa and VIId. History of commercial catch and landings of all stocks of herring caught in Division IVa East. Catch in tonnes by country, 2005–2014. These figures do not in all cases correspond to the official statistics and cannot be used for legal purposes.

Country	2005	2006	2007	2008	2009
Denmark *	5 761	8 614	2 646	1 587	499
Faroe Islands	738	975	577	400	700
France	-	-	-	-	-
Germany	-	34	-	-	-
Netherlands	-	-	263	-	-
Norway	89 925	90 065	54 424	17 474	6 981
UK (Scotland)	-	83	-	-	-
Sweden	3 510	2 857	640	-	1 735
Unallocated landings **	0	0	-96	0	0
Total landings	99 934	102 628	58 454	19 461	9 915
Discards	-	-	-	-	-
Total catch	99 934	102 628	58 454	19 461	9 915
Norw. spring spawners ***	417	626	685	2 721	44 560
Country	2010	2011	2012	2013	2014
Denmark *	-	1 590	1 822	1 162	-
Faroe Islands	719	-	-	-	-
France	-	-	-	-	30
Germany	-	-	-	15	-
Netherlands	-	-	-	-	-
Norway	7 362	12 922	32 714	76 894	44 060
UK (Scotland)	-	167	-	-	124
Sweden	1 505	150	815	865	940
Unallocated landings	0	0	0	0	0
Total landings	9 586	14 829	35 351	78 936	45 154
Discards	-	-	-	-	-
Total catch	9 586	14 829	35 351	78 936	45 154
Norw. spring spawners ***	56 900	12 178	9 619	3 150	2 307

* Including any bycatches in the industrial fishery.

** Negative unallocated catches due to misreporting into other areas.

*** These catches (including some fjord-type spring spawners) are taken by Norway under a separate quota south of 62°N and are not included in the Norwegian North Sea catch figure for this area.

Table 6.3.12.15 Herring in Subarea IV and Divisions IIIa and VIId. History of commercial catch and landings of all stocks of herring caught in Division IVb. Catch in tonnes by country, 2005–2014. These figures do not in all cases correspond to the official statistics and cannot be used for legal purposes.

Country	2005	2006	2007	2008	2009
Denmark*	41 423	32 277	35 990	32 230	29 164
Faroe Islands	-	200	1 196	1 612	815
France	10 205	17 385	8 421	9 687	4 316
Germany	14 381	14 222	2 205	2 415	1 061
Netherlands	10 038	13 363	8 550	904	3 164
Norway	645	6 933	5 347	1 543	17 538
Sweden	1 694	2 715	7 150	6 815	2 129
UK (England)	3 869	4 924	577	833	2
UK (Scotland)	1 286	977	-	1 293	3 757
Unallocated landings**	10 233	2 364	-203	-904	-166
Total landings	93 774	95 360	69 233	56 428	61 780
Discards	1 963	-	-	30	-
Total catch	95 737	95 360	69 233	56 458	61 780
Country	2010	2011	2012	2013	2014
Denmark*	19 671	30 498	60 503	34 707	49 118
Faroe Islands	1 185	-	-	-	-
France	2 349	1 687	3 898	8 728	7 839
Germany	1 994	1 778	4 187	17 701	4 424
Lithuania	-	-	-	-	1 701
Netherlands	830	7 314	9 202	43 339	22 628
UK (N. Ireland)	-	-	-	-	591
Norway	557	2 537	13 958	17 307	7 968
Sweden	580	2 815	7 212	2 470	6 883
UK (England)	1 577	4 748	3 045	4 391	4 498
UK (Scotland)	805	488	1 062	1 312	3 151
Unallocated landings**	0	0	411	42	0
Total landings	29 548	51 865	103 478	129 955	108 801
Discards	-	-	-	-	-
Total catch	29 548	51 865	103 478	129 997	108 801

* Including any bycatches in the industrial fishery.

** Negative unallocated catches due to misreporting into other areas.

Table 6.3.12.16 Herring in Subarea IV and Divisions IIIa and VIId. History of commercial catch and landings of all stocks of herring caught in Divisions IVc and VIId. Catch in tonnes by country, 2005–2014. These figures do not in all cases correspond to the official statistics and cannot be used for legal purposes.

Country	2005	2006	2007	2008	2009
Belgium	6	3	1	-	-
Denmark*	206	969	113	621	25
Faroe Islands	-	30	-	-	-
France	15 150	13 637	7 918	7 592	6 731
Germany	9 896	7 553	7 703	5 182	4 307
Netherlands	34 874	23 743	14 958	10 584	10 371
UK (England)	5 919	5 243	3 583	2 529	72
UK (Scotland)	-	-	-	1	-
Unallocated landings	8 231	5 419	4 725	3 103	417
Total landings	74 282	56 597	39 001	29 612	21 923
Discards	-	-	-	-	-
Total catch	74 282	56 597	39 001	29 612	21 923
**Coastal spring spawners included above	74	65	2	7	48
Country	2010	2011	2012	2013	2014
Belgium	-	4	3	14	27
Denmark*	1 106	115	515	624	586
France	8 984	7 121	8 790	11 644	9 190
Germany	5 171	5 007	7 268	9 883	9 098
Netherlands	9 449	12 192	16 488	18 705	14 639
Norway	-	46	-	-	-
UK (England)	1 809	2 165	4 012	3 814	4 704
UK (Scotland)	1	-	-	42	-
***Unallocated landings	0	0	3 326	-42	0
Total landings	26 520	26 650	40 402	44 684	38 244
Discards	-	-	-	-	-
Total catch	26 520	26 650	40 402	44 684	38 244
**Coastal spring spawners included above	85	2	63	20	10

* Including any bycatches in the industrial fishery.

** Landings from the Thames estuary area are included in the North Sea catch figure for UK (England).

*** Negative unallocated catches due to misreporting into other areas.

Table 6.3.12.17 Herring in Subarea IV and Divisions IIIa and VIId. "The Wonderful Table", which shows herring caught in the North Sea. Catch in thousand tonnes in Subarea IV, Division VIId, and Division IIIa.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Subarea IV and Division VIId: TAC (IV and VIId)												
Agreed Divisions IVa,b	393.9	460.7	404.7	303.5	174.6	147.4	149.0	173.5	360.4	427.7	418.3	396.3
Agreed Divisions IVc, VIId	66.1	74.3	50.0	37.5	26.7	23.6	15.3	26.5	44.6	50.3	51.7	49.0
Bycatch ceiling in the small-mesh fishery *	38.0	50.0	42.5	31.9	18.8	16.0	13.6	16.5	17.9	14.4	13.1	15.7
CATCH (IV and VIId)												
National catch Divisions IVa,b **	427.7	502.3	439.2	326.8	201.2	145.0	148.1	191.7	387.2	453.8	465.9	
Unallocated catch Divisions IVa,b	36.9	49.6	13.3	21.9	14.0	-1.1	0.0	0.0	-3.0	0.0	3.3	
Discard/slipping Divisions IVa,b ***	17.1	12.8	1.5	0.1	0.2	0.1	0.0	-	-	-	0.0	
Total catch Divisions IVa,b #	481.6	564.6	454.0	348.8	215.4	143.9	148.1	191.7	384.2	453.9	469.2	
National catch Divisions IVc, VIId **	56.5	66.1	51.2	34.3	26.5	21.5	26.5	26.7	37.1	44.7	38.2	
Unallocated catch Divisions IVc, VIId	12.0	8.2	5.4	4.7	3.1	0.4	0.0	0.0	3.3	0.0	0.0	
Discard/slipping Divisions IVc, VIId ***	-	-	-	-	-	-	-	-	-	-	-	
Total catch Divisions IVc, VIId	68.5	74.3	56.6	39.0	29.6	21.9	26.5	26.7	40.4	44.7	38.2	
Total catch IV and VIId as used by ICES #	550.1	638.9	510.6	387.8	245.0	165.8	174.6	218.4	424.6	498.5	507.5	
CATCH BY FLEET/STOCK (IV and VIId) ###												
North Sea autumn spawners directed fisheries (A-fleet)	529.5	610.0	487.1	379.6	236.3	152.1	164.8	209.2	411.8	489.9	490.5	
North Sea autumn spawners industrial (B-fleet)	13.6	21.8	11.9	7.1	8.6	9.8	9.1	8.9	10.6	8.1	14.0	
North Sea autumn spawners in IV and VIId total	543.0	631.9	499.0	386.7	244.9	161.9	173.9	218.1	422.5	498.1	504.5	
Baltic-IIIa-type spring spawners in IV	7.1	7.0	11.0	1.1	0.1	3.9	0.8	0.3	2.1	0.5	3.0	
Coastal-type spring spawners	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	
Norw. spring spawners caught under a separate quota in IV ####	0.5	0.4	0.6	0.7	2.7	44.6	56.9	12.2	9.6	3.2	2.3	
Division IIIa: TAC (IIIa)												
Agreed herring TAC	70.0	96.0	81.6	69.4	51.7	37.7	33.9	30.0	45.0	55.0	46.8	43.6
Bycatch ceiling in the small-mesh fishery	21.0	24.2	20.5	15.4	11.5	8.4	7.5	6.7	6.7	6.7	6.7	6.7
CATCH (IIIa)												
National catch	61.1	90.8	88.9	47.3	38.2	38.8	37.3	20.0	27.7	31.2	28.9	
Catch as used by ICES	52.7	69.6	51.2	47.4	38.2	38.8	37.3	20.0	27.7	31.2	28.9	
CATCH BY FLEET/STOCK (IIIa) ###												
Autumn spawners human consumption (C-fleet)	13.4	22.9	11.6	16.4	9.2	5.1	12.0	6.6	7.8	11.8	9.5	
Autumn spawners mixed clupeoid (D-fleet)	10.8	9.0	3.4	3.4	3.7	1.5	1.8	1.8	4.4	1.6	3.3	
Autumn spawners in IIIa total	24.2	31.9	15.0	19.8	12.9	6.5	13.8	8.4	12.2	13.4	12.8	
Spring spawners human consumption (C-fleet)	16.8	32.5	30.2	25.3	23.0	29.4	23.0	10.8	14.5	16.6	15.4	
Spring spawners mixed clupeoid (D-fleet)	11.2	5.1	5.9	2.3	2.2	2.9	0.5	0.8	1.0	1.3	0.6	
Spring spawners in IIIa total	28.0	37.6	36.1	27.6	25.2	32.3	23.5	11.6	15.5	17.9	16.1	
North Sea autumn spawners: Total as used by ICES	567.2	663.8	514.6	406.5	257.9	168.4	187.6	226.5	434.6	511.4	517.3	

* Divisions IVa, b and EC zone of Division IIa.

** ICES estimates.

*** Incomplete, only some countries providing discard information.

Includes spring spawners not included in assessment.

Based on sum-of-products (number × mean weight-at-age).

These catches (including local fjord-type spring spawners) are taken by Norway under a separate quota south of 62°N and are not included in the Norwegian North Sea catch figure.

Summary of the assessment

Table 6.3.12.18 Herring in Subarea IV and Divisions IIIa and VIId. Assessment summary with weights (in tonnes).

Year	Recruitment at age (wr) 0 (thousands)	SSB *		Fishing mortality at ages (wr) 2–6		Catches (tonnes)						
		High	Low	High	Low	High	Low					
1947	74 551 446	124 563 228	44 619 253	3 767 793	4 827 892	2 940 469	0.173	0.237	0.126	845 768	682 272	1048 442
1948	67 727 306	107 990 995	42 475 653	3 181 935	4 060 132	2 493 690	0.17	0.227	0.128	687 626	571 364	827 544
1949	58 410 136	92 699 534	36 804 328	3 103 373	3 928 116	2 451 792	0.184	0.245	0.138	715 688	593 862	862 506
1950	82 145 285	127 330 318	52 994 824	3 029 778	3 787 752	2 423 484	0.193	0.252	0.148	656 711	567 732	759 636
1951	74 402 492	113 745 858	48 667 538	2 841 947	3 530 854	2 287 453	0.235	0.3	0.183	766 048	668 790	877 450
1952	74 328 127	112 277 271	49 205 600	2 791 250	3 473 514	2 242 995	0.246	0.315	0.192	830 680	733 428	940 827
1953	80 438 220	118 880 340	54 427 059	2 618 206	3 272 958	2 094 437	0.261	0.334	0.204	843 234	746 523	952 474
1954	74 925 137	109 056 778	51 475 720	2 436 322	3 066 253	1 935 804	0.293	0.378	0.227	918 043	813 173	1 036 438
1955	66 519 121	96 340 640	45 928 629	2 412 080	3 027 602	1 921 695	0.289	0.372	0.225	865 446	768 234	974 959
1956	48 158 105	69 831 545	33 211 395	2 226 630	2 799 654	1 770 891	0.292	0.371	0.229	850 007	753 333	959 088
1957	136 113 547	200 509 944	92 398 897	2 043 143	2 569 148	1 624 832	0.307	0.39	0.241	784 655	698 066	881 986
1958	49 032 799	70 688 595	34 011 362	1 698 065	2 148 201	1 342 251	0.316	0.4	0.249	790 958	702 784	890 195
1959	58 002 693	84 870 065	39 640 743	2 633 963	3 320 067	2 089 644	0.329	0.42	0.259	1 139 386	961 866	1 349 668
1960	22 009 836	32 758 217	14 788 133	2 253 511	2 830 566	1 794 098	0.283	0.358	0.224	838 190	730 337	961 970
1961	113 011 484	167 014 100	76 470 163	2 141 463	2 654 734	1 727 429	0.32	0.397	0.258	759 944	657 418	878 459
1962	52 483 007	76 319 452	36 091 271	1 530 339	1 921 835	1 218 595	0.347	0.437	0.276	672 663	585 623	772 640
1963	79 717 524	112 891 665	56 291 877	2 488 026	3 080 133	2 009 742	0.237	0.296	0.189	654 744	551 609	777 163
1964	83 553 692	118 424 004	58 951 050	2 400 050	2 878 710	2 000 979	0.319	0.384	0.266	930 986	810 487	1 069 401
1965	38 034 340	54 150 101	26 714 835	1 947 389	2 285 534	1 659 272	0.505	0.603	0.423	1 228 126	1 061 625	1 420 740
1966	34 622 004	48 728 995	24 598 972	1 581 683	1 851 113	1 351 468	0.508	0.596	0.433	974 812	859 909	1 105 069
1967	43 055 477	60 251 739	30 767 146	1 026 843	1 195 516	881 969	0.653	0.763	0.558	834 844	736 826	945 901
1968	41 243 332	57 907 322	29 374 738	564 107	655 138	485 726	0.959	1.12	0.821	814 231	698 801	948 729
1969	19 249 584	27 458 634	13 494 717	511 959	621 283	421 872	0.86	1.008	0.735	555 154	478 544	644 028
1970	36 910 256	51 075 281	26 673 705	489 921	596 376	402 469	0.902	1.045	0.779	533 919	458 694	621 481
1971	27 017 625	37 097 109	19 676 791	348 015	418 579	289 346	1.216	1.421	1.04	542 531	469 063	627 506
1972	17 716 377	24 227 342	12 955 197	350 109	422 196	290 330	0.633	0.751	0.534	471 182	403 953	549 600
1973	8 806 494	12 196 193	6 358 898	302 247	359 962	253 786	0.833	0.962	0.72	445 076	384 933	514 615
1974	16 902 972	23 488 127	12 164 037	203 008	240 813	171 138	0.85	0.992	0.729	273 758	239 735	312 610
1975	3 764 027	5 596 791	2 531 433	117 830	143 588	96 693	0.99	1.219	0.804	268 069	225 803	318 247
1976	4 876 801	7 432 556	3 199 866	165 711	218 157	125 873	0.741	0.982	0.559	149 492	120 497	185 465
1977	5 509 586	8 547 905	3 551 225	124 368	168 093	92 017	0.334	0.457	0.244	845 768	682 272	1 048 442

Year	Recruitment at age (wr) 0 (thousands)	High		Low		SSB * (tonnes)	High		Low		Fishing mortality at ages (wr) 2–6	High		Low		Catches (tonnes)	High		Low	
		High	Low	High	Low		High	Low	High	Low		High	Low							
1978	5 694 435	8 961 129	3 618 583	154 662	203 679	117 442	0.245	0.342	0.175	687 626	571 364	827 544								
1979	11 184 059	16 942 300	7 382 892	190 042	241 890	149 307	0.203	0.28	0.148	715 688	593 862	862 506								
1980	16 919 883	23 864 945	11 995 940	210 871	261 223	170 224	0.181	0.228	0.144	656 711	567 732	759 636								
1981	37 655 892	51 862 534	27 340 859	309 279	381 938	250 443	0.201	0.251	0.162	766 048	668 790	877 450								
1982	60 188 990	81 345 234	44 535 055	430 628	526 970	351 899	0.183	0.226	0.148	830 680	733 428	940 827								
1983	56 797 337	75 971 133	42 462 674	646 288	788 279	529 873	0.23	0.282	0.188	843 234	746 523	952 474								
1984	53 704 105	72 391 974	39 840 478	1 031 990	1 258 573	846 200	0.305	0.371	0.252	918 043	813 173	1 036 438								
1985	68 544 930	93 958 523	50 005 122	1 095 805	1 315 381	912 883	0.392	0.478	0.322	865 446	768 234	974 959								
1986	81 327 925	111 778 478	59 172 674	1 126 921	1 340 806	947 155	0.378	0.457	0.312	850 007	753 333	959 088								
1987	83 136 966	112 148 136	61 630 584	1 310 606	1 561 062	1 100 332	0.37	0.445	0.308	784 655	698 066	881 986								
1988	43 098 554	58 411 048	31 800 240	1 679 489	1 996 843	1 412 571	0.359	0.43	0.299	790 958	702 784	890 195								
1989	36 324 391	49 139 473	26 851 354	1 749 779	2 034 585	1 504 841	0.344	0.411	0.288	1 139 386	961 866	1 349 668								
1990	30 371 038	41 571 824	22 188 103	1 785 127	2 068 473	1 540 594	0.293	0.351	0.245	838 190	730 337	961 970								
1991	31 832 553	43 103 467	23 508 815	1 544 174	1 787 768	1 333 772	0.321	0.383	0.27	759 944	657 418	878 459								
1992	60 249 209	79 510 433	45 653 973	1 177 613	1 374 479	1 008 944	0.363	0.434	0.303	672 663	585 623	772 640								
1993	52 064 818	68 799 842	39 400 458	834 009	986 197	705 307	0.417	0.501	0.347	654 744	551 609	777 163								
1994	36 984 150	49 443 185	27 664 628	903 472	1 061 095	769 263	0.429	0.516	0.356	930 986	810 487	1 069 401								
1995	48 158 105	65 030 698	35 663 203	952 647	1 128 705	804 052	0.372	0.456	0.303	1 228 126	1 061 625	1 420 740								
1996	45 901 117	62 705 116	33 600 328	1 090 340	1 290 890	920 947	0.219	0.275	0.174	974 812	859 909	1 105 069								
1997	31 139 884	43 215 596	22 438 482	1 251 683	1 480 226	1 058 427	0.194	0.24	0.157	834 844	736 826	945 901								
1998	22 908 074	31 583 519	16 615 624	1 516 628	1 771 918	1 298 119	0.216	0.266	0.175	814 231	698 801	948 729								
1999	74 850 249	103 200 597	54 288 056	1 592 794	1 863 631	1 361 317	0.204	0.249	0.167	555 154	478 544	644 028								
2000	49 624 737	68 372 387	36 017 677	1 583 265	1 848 790	1 355 876	0.206	0.251	0.169	533 919	458 694	621 481								
2001	90 061 200	124 228 852	65 290 950	2 154 351	2 522 370	1 840 027	0.181	0.222	0.148	542 531	469 063	627 506								
2002	45 672 184	63 063 657	33 076 870	2 478 093	2 890 597	2 124 456	0.17	0.208	0.139	471 182	403 953	549 600								
2003	22 009 836	30 276 791	16 000 140	2 535 750	2 937 526	2 188 926	0.195	0.238	0.16	445 076	384 933	514 615								
2004	26 376 921	36 200 345	19 219 209	2 502 999	2 902 759	2 158 292	0.238	0.293	0.192	273 758	239 735	312 610								
2005	24 324 631	33 332 078	17 751 298	2 373 794	2 770 385	2 033 976	0.254	0.313	0.206	268 069	225 803	318 247								
2006	28 602 366	39 221 530	20 858 323	1 857 979	2 173 346	1 588 374	0.225	0.277	0.183	149 492	120 497	185 465								
2007	28 092 129	39 477 301	19 990 418	1 497 039	1 755 905	1 276 337	0.194	0.24	0.157	60 355	49 582	73 468								
2008	28 889 825	40 974 005	20 369 548	1 558 135	1 822 389	1 332 198	0.127	0.155	0.103	51 483	37 101	71 439								
2009	38 647 784	53 448 183	27 945 781	1 908 828	2 235 839	1 629 646	0.075	0.094	0.06	64 602	46 302	90 135								
2010	38 378 194	53 270 241	27 649 317	1 970 898	2 323 331	1 671 927	0.079	0.098	0.064	80 419	68 833	93 954								
2011	32 508 105	44 914 121	23 528 834	2 397 651	2 782 892	2 065 740	0.101	0.125	0.082	160 813	131 756	196 279								

Year	Recruitment at age (wr) 0 (thousands)	SSB *		SSB * (tonnes)	Fishing mortality at ages (wr) 2– 6		Catches (tonnes)					
		High	Low		High	Low	High	Low	High	Low		
2012	36 215 581	50 636 317	25 901 732	2 586 976	3 009 990	2 223 410	0.159	0.196	0.129	272 120	224 638	329 640
2013	38 339 835	57 490 599	25 568 406	2 285 282	2 677 514	1 950 508	0.194	0.243	0.156	483 110	426 081	547 772
2014	68 888 513	109 874 834	43 191 212	2 219 961	2 660 581	1 852 312	0.203	0.263	0.157	506 358	446 989	573 613
2015	17 175 594	38 982 867	7 567 454	**2 215 525								
Avg.	46 320 042	66 421 072	32 436 237	1 594 818	1 917 548	1 312 914	0.35	0.428	0.287	565 387	492 317	649 712

* At spawning time

** Predicted

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