

5.3.19 Herring (*Clupea harengus*) in Divisions VIa and VIIb,c (West of Scotland, West of Ireland)

ICES stock advice

ICES advises that when the MSY approach is applied, there should be zero catch in 2016. ICES advises that a rebuilding plan be developed for this stock.

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

The information presented here represents two stocks assessed in combination. The spawning biomass (SSB) for the combined stocks has been declining since 2004 and is currently below B_{lim} . The fishing mortality (F) has been below F_{MSY} since the late 1990s. Recruitment (R) has been at the lowest in the series for the past three years.

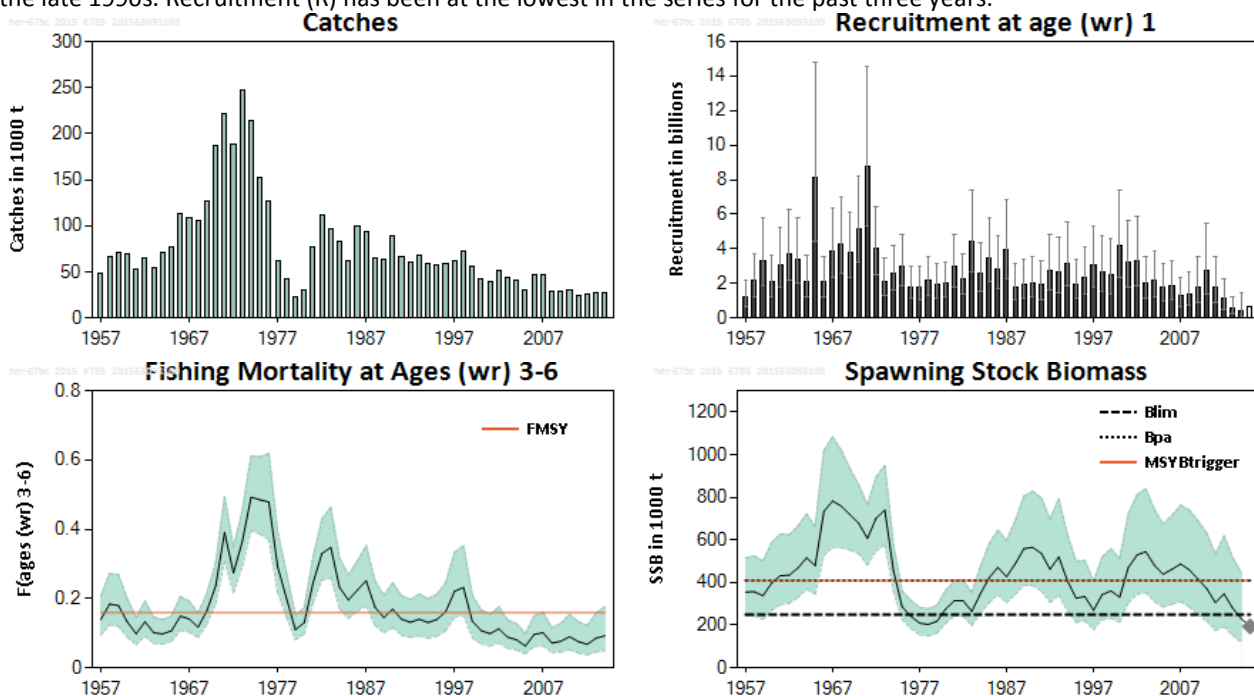


Figure 5.3.19.1 Herring in Divisions VIa and VIIb,c. ICES estimated catches, and the R, F, and SSB from the summary of stock assessment (weights in thousand tonnes). Estimated values for recruitment are unshaded and a diamond shape designates the estimated SSB.

Stock and exploitation status

Table 5.3.19.1 Herring in Divisions VIa and VIIb,c. 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	
Precautionary approach	F_{pa}	✓	✓	✓	Below possible reference points	
Management Plan	F_{MGT}	-	-	-	Not applicable	
	MSY	✗	✗	✗	Below trigger	
	$B_{trigger}$	✗	✗	✗	Reduced reproductive capacity	
	B_{pa}	○	✗	✗		
	B_{lim}					
	SSB_{MGT}	-	-	-	Not applicable	

Catch options

Table 5.3.19.2 Herring in Divisions VIa and VIIb,c. The basis for the catch options.

Variable	Value	Source	Notes
F ages (wr) 3-6 (2015)	0.11	ICES (2015a; 2015b)	Catch constraint, TAC VIaN
Total catch (2015)	22690 t	ICES (2015a; 2015b)	TAC, VIaN = 22,690 t; TAC VIaS = 0 t
Wanted catch (2015)*	22690 t	ICES (2015a; 2015b)	TAC, VIaN = 22,690 t; TAC VIaS = 0 t
Unwanted catch (2015)*	-	ICES (2015a; 2015b)	Considered to be negligible
R age (wr) 1 (2015-2016)	623435	ICES (2015a; 2015b)	Geometric mean 2012-2014
SSB (2015)	194194 t	ICES (2015a; 2015b)	SSB in advice year for an autumn spawning stock

* The term “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.

Table 5.3.19.3 Herring in Divisions VIa and VIIb,c. The catch options. All weights are in tonnes.

Rationale	Catch (2016)	Basis	F (2016)	SSB (2016) *	% SSB change **	% TAC change ***
MSY approach	0	Zero catch	0	166670	-14%	-100%
Other options	12762	$F_{MSY} \times SSB_{2015} / MSY B_{trigger}$	0.08	159452	-18%	-44%
	17797	F_{2015}	0.11	156570	-19%	-22%
	22690	TAC 2015	0.14	153750	-21%	0%
	26049	F_{MSY}	0.16	151803	-22%	15%
	17018	$TAC_{2015} - 25\%$	0.10	157017	-19%	-25%
	8509	$F = 0.05$	0.05	161870	-17%	-62%

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

** SSB 2016 relative to SSB 2015.

*** Catch 2016 relative to TAC 2015.

Basis of the advice

Table 5.3.19.4 Herring in Divisions VIa and VIIb,c. The basis of the advice.

Advice basis	MSY approach
Management plan	There is no agreed management plan for the combined stocks. There was a management plan for herring in VIa North; this plan is not appropriate for the combined stocks.

Quality of the assessment

A combined assessment of VIaN and of VIaS/VIIbc herring was benchmarked in 2015 (ICES, 2015a). The stocks are combined because it is not possible to segregate them in commercial catches or surveys. ICES still considers that separate stocks exist.

The assessment estimates an average F for the combined stocks. The estimated F is not indicative of F on either stock, and the smaller component stock may suffer a much higher F than the larger stock. The estimations of SSB and R reflect the combined stocks.

Historic assessment results are not presented because this is the first time that advice is presented for the combined stocks in recent past.

Issues relevant for the advice

This is the first time since 1981 that combined advice has been given for these two stocks.

Considering the low SSB and low recruitment in recent years, it is not possible to identify any non-zero catch that would be compatible with the MSY and precautionary approach. There is no catch option for 2016 that is consistent with the combined stocks recovering to above B_{lim} .

Fishing should not proceed unless accompanied by a rebuilding plan. Such a plan should include rebuilding targets and time lines as well as protections for each stock.

Reference points

Table 5.3.19.5 Herring in Divisions VIa and VIIb,c. Reference points, values and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	410000 t	B_{pa}	ICES (2015a)
	F_{MSY}	0.16	Stochastic simulations from segmented regression stock–recruitment relationship.	ICES (2015a)
Precautionary approach	B_{lim}	250000 t	Breakpoint in segmented regression stock-recruitment relationship	ICES (2015a)
	B_{pa}	410000 t	B_{lim} raised by assessment uncertainty	ICES (2015a)
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	SSB_{MGT}	Not applicable		
	F_{MGT}	Not applicable		

Basis of the assessment

Table 5.3.19.6 Herring in Divisions VIa and VIIb,c. The basis of the assessment.

ICES stock data category	1 (ICES, 2015c)
Assessment type	Age-based analytical assessment (SAM; ICES, 2015b) that uses catches in the model and in the forecast.
Input data	Commercial catches, (weights, ages and length frequencies from catch sampling); Malin Shelf Herring Acoustic Survey data (MSHAS), west of Scotland herring acoustic survey (MSHAS_N), Scottish west coast IBTS surveys (quarters 1 and 4).
Discards and by-catch	Not included, considered negligible.
Indicators	None
Other information	Benchmarked in WKWEST (ICES, 2015a), updated with corrected natural mortalities by ICES (2015a). This is an autumn/winter spawning stock. Age is given in winter rings, so for example: a 2-year-old fish is termed “1-winter ring”.
Working group	Herring Assessment Working Group for the Area South of 62°N (HAWG)

Information from stakeholders

Information from stakeholders (Scottish Pelagic Fishermen’s Association and the Pelagic Freezer Trawler Association) indicate that fishing patterns have been stable in Division VIa north for the last eight years, since the implementation of the West of Scotland herring management plan. Over the last three years (2012-2014), Scottish pelagic skippers reported observations of herring marks/shoals over a wide area of the northern part of Division VIa north, and fishable aggregations were easily located.

History of advice, catch and management

Table 5.3.19.7 Herring in Divisions VIa and VIIb,c. History of ICES advice, the agreed TAC, and ICES estimates of catch. Weights are in thousand tonnes.

Year	ICES Advice	Predicted catch corresponding to advice	Sum of agreed TACs	Discards / Slippage	ICES estimated catches
2015*	Prior to the advice for 2016, ICES advised separately for herring in Division VIa North and herring in Division VIa South and VIIb,c. See ICES 2014a and 2014b for the history of ICES advice on these individual stocks	-	-	-	-
2016	MSY approach	0			

* See Table 5.3.12.1 [Herring in Division VIa \(North\)](#) and Table 5.3.13.1 in [Herring in Divisions VIaS and VIIb,c](#) for the full histories of ICES advice, management, landings, and catches.

History of catch and landings

Table 5.3.19.10 Herring in Divisions VIa and VIIb,c. Catch distribution by fleet in 2014 as estimated by ICES.

Catch (2014)	Landings		Discards
26 kt	99% pelagic trawl	Ringnets negligible	Negligible
	26 kt		

Table 5.3.19.11a Herring in Divisions VIa and VIIb,c. History of commercial catch and landings, both official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Faroe Islands	0	0	274	0	0	0	0	0	0	0	800	400
France	119	818	5087	3672	2297	3093	1903	463	870	760	1855	1 370
Germany	5890	4693	7938	3744	7836	8873	8253	6752	4615	3944	3810	2 935
Ireland	33985	35836	30493	28998	33521	26275	36399	24240	15005	15589	17311	16 502
Netherlands	8900	8632	10683	9015	11196	13273	10983	9112	5881	6622	4978	3 609
Lithuania	0	0	0	0	0	0	0	0	0	0	0	0
Norway	2389	7447	30676	4840	6223	4962	5317	2695	0	0	0	0
UK	32730	32802	4237	42685	46639	44273	42302	36446	22816	21862	20604	16 947
Total landings	84013	90228	80914	92954	107712	100749	105157	79708	49187	48777	49358	41 763
Discards*	300	250	700	0	0	112	90	0	0	0	0	0
Total catch	84313	90478	81614	92954	107712	100861	105247	79708	49187	48777	49358	41 763
Corrected for VIaS/VIIbc unallocated/ area misreported	88913	96728	87864	94054	114612	101561	116447	87624	57635	50167	53231	45 344
Corrected for VIaN unallocated	83428	92975	88564	89513	96859	93546	104699	79469	57635	50444	59475	48 164
Corrected for VIaN area misreported	60835	68578	58330	57367	58605	63780	72253	55846	43008	40007	50740	44 583
ICES estimate	60835	68578	58330	57367	58605	63780	72253	55846	43008	40007	50740	44 583
Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Faroe Islands	228	1810	570	484	927	1544	70	0	0	0	360	
France	625	613	701	703	564	1049	511	504	244	586	589	
Germany	1046	2691	3152	1749	2526	27	3583	3518	1829	4025	3354	
Ireland	12844	16231	19192	17791	13340	10468	10241	8203	7178	4584	5565	
Netherlands	8296	5132	7361	8065	4133	5675	3600	1684	3523	1815	1641	
Lithuania	0	0	0	0	0	0	0	0	0	0	770	
Norway	0	0	0	0	0	0	0	0	0	0	0	
UK	17706	17494	18290	17618	13963	11076	12018	11696	12249	15906	16769	
Total landings	40745	43971	49266	46410	35453	29839	30023	25605	25023	26916	29048	
Discards*	123	772	163	0	0	0	95	0	0	30	0	
Total catch	40868	44743	49429	46410	35453	29839	30118	25605	25023	26946	29048	
Corrected for unallocated/area misreported	43681	47623	54135	51552	38556	31774	32846	28277	27803	29414	31211	
Corrected for VIaN unallocated	47171	47623	54135	51552	38556	31774	32846	28277	27803	29414	31211	
Corrected for VIaN area misreported	27123	40286	30360	47251	47433	29394	28976	30118	24678	25023	26946	
ICES estimate	27123	40286	30360	47251	47433	29394	28976	30118	24678	25023	26946	

* Unraised discards

Table 5.3.19.11b Herring in Divisions VIa and VIIb c. The Division VIaN component of the stock. History of commercial catch and landings, both official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Faroe Islands			274								800	400
France	119	818	5087	3672	2297	3093	1903	463	870	760	1340	1370
Germany	5640	4693	7938	3733	7836	8873	8253	6752	4615	3944	3810	2935
Ireland	7985	8236	6093	3548	9721	1875	11199	7915	4841	4311	4239	3581
Netherlands	8000	6132	8183	7808	9396	9873	8483	7244	4647	4534	4612	3609
Lithuania												
Norway	2389	7447	30676	4840	6223	4962	5317	2695				
UK	32730	32602	-4287	42661	46639	44273	42302	36446	22816	21862	20604	16947
Unallocated	-5485	-3753	700	-4541	-17753	-8015	-11748	-8155		277	6244	2820
Discards*	200					62	90					
Total	51578	56175	54664	61271	64359	64995	65799	61514	37789	35688	41649	31622
Area misreported	-22593	-24397	-30234	-32146	-38254	-29766	-32446	-23623	-14627	-10437	-8735	-3581
ICES estimate	28985	31778	24430	29575	26105	35233	33353	29736	23162	25251	32914	28081
Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Faroes Islands	228	1810	570	484	927	1544	70				360	
France	625	613	701	703	564	1049	511	504	244	586	589	
Germany	1046	2691	3152	1749	2526	27	3583	3518	1829	4025	3354	
Ireland	1894	2880	4352	5129	3103	1935	2728	3956	3451	3124	2632	
Netherlands	8232	5132	7008	8052	4133	5675	3600	1684	3523	1775	1641	
Lithuania											770	
Norway												
UK	17706	17494	18284	17618	13963	11076	12018	11696	12249	15906	16769	
Unallocated	3490											
Discards*	123	772	163				95			30		
Total	33344	31392	34230	33735	25216	21306	22510	21358	21296	25446	26115	
Area misreported	-6885	-17263	-6884	-4119	-9162	-2798	-2728	-3599	-2780	-2468	-4088	
ICES estimate	26459	14129	27346	29616	16054	18508	19877	17759	18516	22978	22027	

* Unraised discards

Table 5.3.19.11c Herring in Divisions VIa and VIIb c. The Divisions VIaS/VIIbc component of the stock. History of commercial catch and landings, both official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
France											515			
Germany	250			11										
Ireland	26000	27600	24400	25450	23800	24400	25200	16325	10164	11278	13072	12921	10950	13351
Netherlands	900	2500	2500	1207	1800	3400	2500	1868	1234	2088	366		64	
UK (N.Ireland)														
UK (England + Wales)			50	24										
UK Scotland		200												
Total landings	27150	30300	26950	26692	25600	27800	27700	18193	11398	13366	13953	12921	11014	13351
Unallocated/ area	4600	6250	6250	1100	6900	700	11200	7916	8448	1390	3873	3581	2813	2880
Discards	100	250	700			50								
ICES estimated catch	31850	36800	33900	27792	32500	28550	38900	26109	19846	14756	17826	16502	13827	16231
Country	2006	2007	2008	2009	2010	2011	2012	2013	2014					
France														
Germany														
Ireland	14840	12662	10237	8533	7513	4247	3727	1460	2933					
Netherlands	353	13						40						
UK (N.Ireland)														
UK (England + Wales)														
UK Scotland	6													
Total landings	15199	12675	10237	8533	7513	4247	3791	1500	2933					
Unallocated/ area misreported	4706	5142	3103	1935	2728	2672	2780	2468	2163					
Discards*														
ICES estimate	19193	17791	13340	10468	10241	6919	6571	3968	5096					

* Unraised discards

Summary of the assessment

Table 5.3.19.14 Herring in Divisions VIa and VIIb c. Assessment summary with weights (in tonnes).

Year	Recruitment at Age (wr) 1	High	Low	SSB [#]	High	Low	Fishing Mortality at Ages (wr) 3-6	High	Low	Model catch	High	Low
	(thousands)			(tonnes)						(tonnes)		
1957	1206218	2159685	673691	356112	515519	245996	0.14	0.207	0.094	37086.192	43114.398	31900.843
1958	2152198	3739070	1238798	357182	524499	243239	0.184	0.272	0.125	51021.378	59856.347	43490.476
1959	3318422	5820705	1891854	338405	501723	228250	0.18	0.269	0.12	49861.279	58779.928	42295.851
1960	2092772	3653187	1198870	398714	587464	270609	0.133	0.199	0.088	41731.019	48572.166	35853.414
1961	3029778	5199934	1765322	432354	629076	297150	0.099	0.146	0.067	33456.454	38924.404	28756.621
1962	3671093	6284573	2144446	434087	623760	302089	0.133	0.193	0.092	49069.846	57008.054	42237.011
1963	3405833	5797084	2000954	467895	664689	329366	0.101	0.146	0.07	39458.312	45661.116	34098.124
1964	2099060	3637259	1211366	515555	722061	368109	0.098	0.139	0.069	41439.922	47790.5	35933.232
1965	8113176	14798465	4448004	479261	663368	346249	0.107	0.15	0.077	46258.476	54836.125	39022.572
1966	2067809	3583809	1193097	733806	1019646	528096	0.149	0.206	0.108	88521.435	105538.553	74248.169
1967	3828563	6330420	2315469	782305	1083506	564834	0.141	0.192	0.103	81797.34	98129.838	68183.184
1968	4278016	7008442	2611340	758426	1019960	563953	0.118	0.158	0.088	72838.504	87428.273	60683.433
1969	3782894	6124737	2336474	718557	933302	553223	0.165	0.216	0.126	98125.25	115584.372	83303.343
1970	5131969	8230683	3199869	678066	858334	535658	0.238	0.304	0.186	136080.241	159355.01	116204.894
1971	8788899	14560708	5305013	606828	764432	481717	0.391	0.495	0.309	227294.088	276834.74	186618.928
1972	4024857	6439926	2515475	701517	895851	549339	0.274	0.347	0.216	158895.177	188573.521	133887.712
1973	2126526	3437648	1315467	739700	948694	576747	0.365	0.455	0.292	240626.207	287825.226	201167.119
1974	2618206	4182011	1639164	454521	575404	359034	0.493	0.612	0.397	219037.888	260212.686	184378.391
1975	2966816	4797905	1834550	285501	360038	226394	0.485	0.609	0.386	147266.625	175056.518	123888.326
1976	1810294	2973390	1102165	241832	316820	184594	0.479	0.619	0.37	119372.006	140612.601	101339.964
1977	1792282	2975127	1079710	210029	283031	155856	0.292	0.392	0.218	58279.169	67990.191	49955.17
1978	2141463	3556848	1289306	203822	276817	150075	0.2	0.273	0.147	38599.708	44966.376	33134.48
1979	1912649	3153413	1160085	218600	293412	162863	0.111	0.151	0.081	22833.865	26620.285	19586.018
1980	1984743	3238332	1216430	276233	363180	210101	0.131	0.174	0.098	32663.058	37956.006	28108.209
1981	2952019	4811174	1811287	314897	408485	242751	0.245	0.319	0.189	69563.828	81141.209	59638.33
1982	2222182	3664749	1347457	315527	411797	241763	0.33	0.43	0.253	108336.781	125880.58	93238.037
1983	4417127	7426292	2627288	264871	352818	198847	0.348	0.463	0.261	99111.425	115613.61	84964.69
1984	2610363	4355594	1564424	348363	475485	255227	0.232	0.316	0.17	81389.374	96106.659	68925.819
1985	3460764	5778517	2072658	422523	582273	306602	0.196	0.268	0.143	62692.682	74445.998	52794.945
1986	2824947	4755028	1678291	470711	646915	342501	0.224	0.308	0.163	97733.533	114604.928	83345.835
1987	3909813	6799549	2248184	427624	596765	306423	0.252	0.353	0.179	96278.47	111893.477	82842.575
1988	1808485	3126081	1046236	487966	690990	344593	0.175	0.251	0.123	65972.944	76203.891	57115.579
1989	1976820	3404358	1147887	559053	805570	387975	0.145	0.209	0.101	64344.066	75150.767	55091.372
1990	2045187	3539258	1181827	565237	827854	385929	0.169	0.246	0.117	81961.098	95762.641	70148.667
1991	1899308	3332933	1082341	536596	797669	360970	0.14	0.209	0.094	66836.191	77386.136	57724.506
1992	2763476	4833542	1579960	462314	696086	307052	0.132	0.197	0.088	58279.169	67179.902	50557.703
1993	2628700	4637448	1490057	520216	793543	341034	0.14	0.213	0.092	64215.507	73726.044	55931.813
1994	3175577	5527948	1824238	407991	622560	267374	0.131	0.2	0.086	54176.364	62526.428	46941.405
1995	1949337	3402938	1116657	326766	499038	213964	0.14	0.212	0.092	55326.097	63991.56	47834.074
1996	2378546	4091211	1382838	334703	503849	222341	0.163	0.246	0.107	56840.251	66058.678	48908.247
1997	3081725	5327688	1782579	270763	406702	180261	0.221	0.334	0.147	66436.375	76731.368	57522.653

Year	Recruitment at Age (wr) 1	High	Low	SSB#	High	Low	Fishing Mortality at Ages (wr) 3-6	High	Low	Model catch	High	Low
	(thousands)			(tonnes)						(tonnes)		
1998	2681803	4762671	1510091	343520	519906	226975	0.232	0.353	0.152	72330.415	83989.417	62289.859
1999	2530684	4570782	1401152	361132	558364	233569	0.135	0.21	0.087	49861.279	58425.811	42552.205
2000	4151582	7359887	2341834	331705	513387	214318	0.108	0.168	0.069	39894.749	46299.82	34375.75
2001	3197884	5663739	1805603	470711	722785	306549	0.099	0.154	0.063	40174.992	46617.38	34622.924
2002	3295274	5844124	1858077	529136	811892	344854	0.113	0.176	0.072	48922.858	57206.101	41838.998
2003	1982759	3552558	1106621	545250	840003	353925	0.088	0.138	0.056	43782.961	50745.499	37775.718
2004	2169484	3875706	1214401	480701	742696	311128	0.081	0.128	0.052	41439.922	48021.954	35760.043
2005	1762070	3135867	990122	438888	673815	285869	0.063	0.099	0.041	28825.048	33256.174	24984.334
2006	1835817	3308675	1018602	461852	714694	298460	0.096	0.15	0.062	44622.79	51161.037	38920.115
2007	1257958	2352259	672739	486991	762928	310855	0.101	0.16	0.064	44756.86	51263.884	39075.785
2008	1412681	2680590	744488	460469	740532	286323	0.072	0.116	0.044	29732.619	34106.094	25919.961
2009	1806677	3509243	930139	416233	690472	250915	0.077	0.128	0.046	30607.489	35220.619	26598.578
2010	2746945	5483385	1376104	372503	632785	219282	0.09	0.155	0.052	29085.644	33488.367	25261.748
2011	1741052	3513733	862690	305896	532390	175759	0.076	0.133	0.043	24809.948	28683.779	21459.291
2012	1102400	2298044	528835	346972	618628	194608	0.068	0.122	0.038	24612.261	28935.924	20934.647
2013	538208	1217345	237950	280127	516562	151911	0.086	0.158	0.047	26502.65	31173.488	22531.66
2014	408399	1491401	111834	229808	444697	118759	0.093	0.177	0.049	25925.958	30616.136	21954.283
2015	623435*			194194**								
Avg.	2706678	4743408	1592800	431890	630681	303848	0.177	0.249	0.127	69430.966	81566.252	59114.787

* Geometric mean 2012-2014.

** Output from short-term forecast.

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

Sources and references

- ICES. 2014a. Herring in Division VIa (North). *In* Report of the ICES Advisory Committee 2015. ICES Advice 2015 Book 5 Section 5.3.12. <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/her-vian.pdf>
- ICES. 2014b. Herring in Divisions VIa (South) and VIIb,c. *In* Report of the ICES Advisory Committee 2015. ICES Advice 2015 Book 5 Section 5.3.13. <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/her-irlw.pdf>
- ICES. 2015a. Report of the Benchmark Workshop on West of Scotland Herring (WKWEST), 2-6 February, Dublin, Ireland. ICES CM 2015\ACOM:34. 299 pp.
- ICES. 2015b. Report of the Herring Assessment Working Group for the Area South of 62°N 10–19 March 2015. ICES CM 2015/ACOM:06.
- ICES. 2015c. Advice basis. *In* Report of the ICES Advisory Committee 2015. ICES Advice 2015 Book 1. In preparation.