

ECOREGION Celtic Seas
STOCK Herring in Divisions VIa (South) and VIIb,c

Advice for 2014

ICES advises on the basis of precautionary considerations that there should be no catches of this stock unless a rebuilding plan is implemented. Discards are considered to be low and all catches are therefore assumed to be landed.

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

Stock status

F (Fishing Mortality)			
	2010	2011	2012
MSY (F_{MSY})	✗	✗	? Unknown
Precautionary approach (F_{pa}, F_{lim})	✗	✗	? Unknown
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ($B_{trigger}$)	?	?	? Undefined
Precautionary approach (B_{pa}, B_{lim})	✗	✗	✗ Reduced reproductive capacity

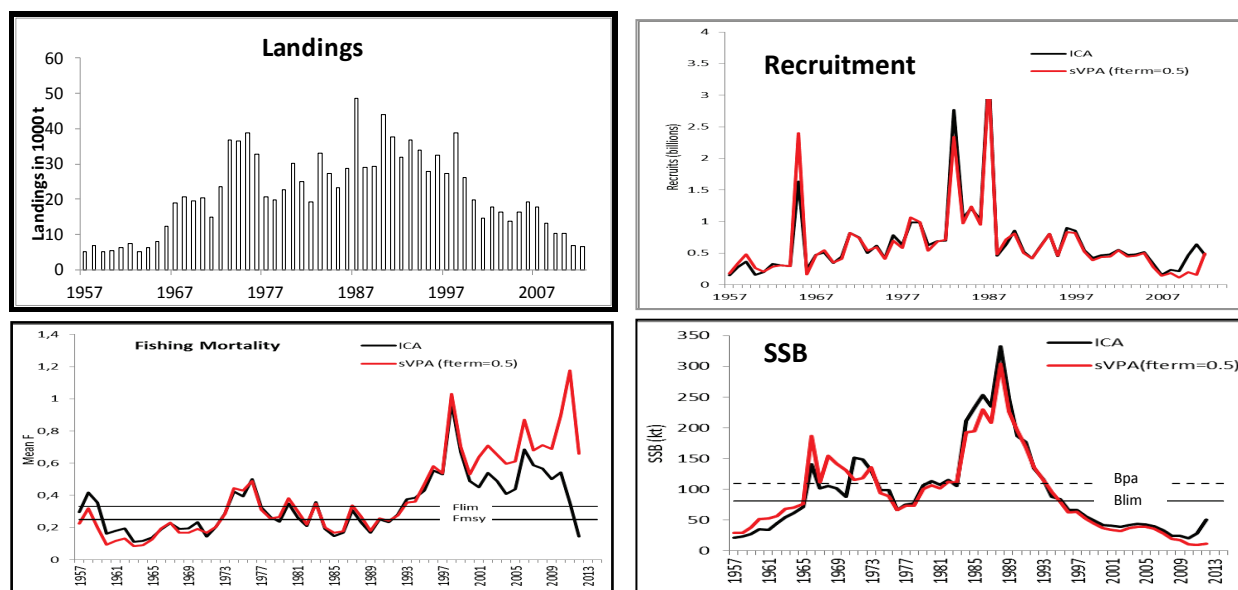


Figure 5.4.13.1 Herring in Divisions VIa (South) and VIIb,c. Results of the exploratory assessments using FLICA and sVPA.

An exploratory assessment (ICA, including survey data from the Malin shelf acoustic survey) shows that SSB is increasing but is likely to be low, whereas F has declined since the high in 1998. Although there is little information on recruitment available and it is very uncertain, it does not appear to be above average, according to this assessment. Another exploratory assessment (SVPA) shows different trends in recent years, but also estimates very low SSB. The last recruitment estimate of the SVPA assessment is uncertain and has been replaced by an average recruitment (1957-2011).

Management plans

There is no explicit management plan for this stock. A revised rebuilding plan was proposed by the Pelagic RAC in 2012. STECF evaluated this plan in 2012–2013, but further evaluation is needed. To date ICES has not been requested to evaluate this plan.

Biology

This autumn- and winter-/spring-spawning stock is considered part of the Malin Shelf stock complex. The stock identity is complex as the juveniles mix with those from the west of Scotland and the adults mix with those from the Irish Sea and Division VIaN over the shelf areas to the west of Scotland after spawning. Fish of this stock are expected to mix with VIa North herring in that area. Spawning and nursery areas are sensitive and vulnerable to anthropogenic influences. Gravel extraction or disturbance in the close vicinity of any herring spawning will disturb that spawning activity and will reduce the available area for successful spawning.

The fisheries

Herring fisheries in this area are only for human consumption. The fisheries take place using pelagic trawls in quarters 1 and 4. The low TAC has led to a much shorter fishing season that now consists of only a few days, compared to the five-month fishery prior to 2003. In 2012 the fishery only took place in quarter 4. Discarding does occur, but is thought to be low.

Catch distribution Total landings (2012) = 6571 t (100% pelagic trawls).

Effects of the fisheries on the ecosystem

The fisheries are considered relatively clean, with little bycatch of other fish and cetaceans.

Quality considerations

The exploratory assessments are the ones considered most reliable for historical trends. The exploratory assessment using separable VPA displays the most consistency and least retrospective bias and hence was chosen from among several separable VPA runs.

The FLICA exploratory assessment uses a survey for tuning (Malin Shelf acoustic survey, MSHAS 2008–2012) that is known to contain herring from a mixture of stocks, and therefore is not an optimal tuning index for this stock. However, if it is possible to disaggregate the index according to stock component, then it could provide a basis for an assessment.

Both assessment approaches, however, give the same signals of the status of the stock being below biological reference points.

Scientific basis

Assessment type	Trends-based exploratory assessments (FLICA, Separable VPA).
Stock data category	Category 2.1.3.
Input data	Commercial catches, (weights, ages and length frequencies from catch sampling); Malin Shelf Acoustic Survey data (MSHAS), annual weights in the stock, fixed maturity ogive, natural mortality assumed to be constant.
Discards and bycatch	Discards are not included in the assessment and are considered to be low.
Indicators	None.
Other information	A benchmark is planned for 2015.
Working group report	HAWG (ICES, 2013).

ECOREGION Celtic Seas
STOCK Herring in Divisions VIa (South) and VIIb,c

Reference points

	Type	Value	Technical basis
MSY Approach	MSY $B_{trigger}$	Undefined.	Under development.
	F_{MSY}	0.25	Stochastic simulations on segmented regression stock–recruitment relationship, under different productivity regimes.
Precautionary approach	B_{lim}	81 000 t.	Lowest reliable estimate.
	B_{pa}	110 000 t.	1.4 B_{lim}
	F_{lim}	0.33	F_{loss}
	F_{pa}	Undefined.	

(unchanged since 2011)

Outlook for 2014

Two exploratory assessments are indicative of stock trends, but they were not used to provide a forecast. The main cause of this is the lack of a split survey data series that accounts for stock mixing with other herring stocks. Particularly F is highly uncertain. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The stock trend is uncertain for recent years, and the stock is considered well below biomass reference points.

There should be no catches of this stock unless a rebuilding plan is implemented.

Additional considerations

Gravel substrate is an important fish habitat for herring spawning. Herring spawning and nursery areas are sensitive and vulnerable to anthropogenic influences. Activities that have an impact on the spawning habitat of herring, such as extraction of marine aggregates (e.g. gravel and sand) and construction in the marine environment, can impact spawning. Herring regularly abandon and repopulate spawning grounds and absence of spawning in any particular year does not mean that the spawning ground is not required to maintain a resilient herring population. Scientific information (Groot, 1979, 1996) supports the advice that no gravel extraction should occur in areas with spawning grounds.

Information from the fishing industry

The pelagic RAC questions ICES interpretation of the poor status of this stock and has put forward a revised rebuilding plan in 2012 for evaluation. The industry is concerned that problems still exist with the assessment, particularly the mixing issue. The Irish authorities, the industry, and the scientists are working together to resolve the problem with the assessment and surveys. Quota restrictions result in only one or two principal grounds off Glen Head and off Tory Island being exploited at present for a very limited period of time. The traditional grounds in Division VIIb, for instance, have not been fished very much in recent years. Fleets fishing in this fishery have reported large and increasing quantities of herring on the grounds, particularly in the northern part of the area in the last four years. This was especially the case during 2011 and 2012, and in spring 2013.

Ecosystem changes

Grey seal abundance is significant to the west of Scotland and they are known to feed on herring, among other species. The latest estimates of grey seal abundance over time show the population in the area to have remained stable since the mid-1990s (Thomas, 2011). The contribution of seal predation to total herring mortality may be significant, but data are limited. Because the consumption of herring by seals is estimated with great uncertainty, the impact on the stock cannot be estimated accurately.

Uncertainty in the assessment

Two exploratory assessments are indicative of stock trends, but they were not used to provide a forecast. The main uncertainty relates to the lack of a tuning series specific for this stock.

Fishery catch data for this specific population may be affected by mixing with neighbouring stocks. The effect of mixing in the acoustic surveys in this area contributes to uncertainty in the assessment. The current assessment includes an acoustic tuning series that is not specific to this stock alone.

The stock identity of herring west of the British Isles was reviewed by the EU-funded project WESTHER. This identified Division VIa (North) as an area where acoustic survey catches consist of a mixture of fish from Divisions VIa (North), VIa (South), VIIb,c, and VIIa (North). The extent of stock mixing in Division VIa (North) catches is unknown. In 2008 ICES began to evaluate the management for Divisions VIa (South), VIIb,c, and VIIa (North). ICES is working to produce an assessment that takes mixing into account. Efforts to split the Malin Shelf acoustic survey according to stock component are underway and should continue.

Comparison with previous assessment and advice

The basis of the advice is the same as last year, precautionary considerations for data-limited stocks.

Sources

- Groot, S. J. de. 1979. The potential environmental impact of marine gravel extraction in the North Sea. *Ocean Management*, 5: 233–249.
- Groot, S. J. de. 1996. The physical impact of marine aggregate extraction in the North Sea. *ICES Journal of Marine Science*, 53: 1051–1053.
- ICES. 2013. Report of the Herring Assessment Working Group for the Area South of 62°N, 13–22 March 2013. ICES CM 2013/ACOM:06.
- Thomas, L. 2011. Estimating the size of the UK grey seal population between 1984 and 2010. SCOS Briefing Paper 11/02.

Table 5.4.13.1 Herring in Divisions VIaS and VIIb,c. ICES advice, management, landings, and catches.

Year	ICES Advice / Single-stock exploitation boundaries	Predicted catch corresp. to advice	Agreed TAC	Official landings	Disc. slip.	ICES catch
1987	TAC	18	17	17	-	49
1988	TAC depending on whether 1987 TAC is taken	11–18	14	15	-	29
1989	TAC	15	20	21	1.0	29
1990	TAC depending on whether 1989 TAC is taken	25–27	27.5	28	2.5	44
1991	TAC	< 26	27.5	23	3.4	38
1992	TAC (including discards)	29	28	27	0.1	32
1993	Precautionary TAC (including discards)	29	28	30	0.3	37
1994	Precautionary TAC	28	28	27	0.7	34
1995	Precautionary TAC (including discards)	36	28	27	-	28
1996	If required, precautionary TAC	34	28	25	-	33
1997	Catches below 25	< 25	28	28	0.1	27
1998	Catches below 25	< 25	28	28	-	39
1999	F 70% of F(97)	19	21	18	-	26
2000	F 40% of F(98) = Proposed F_{pa}	14	14	10	-	20
2001	F 40% of F(99) F = 0.2	14	14	13	-	15
2002	No increase in catches	14	14	14	-	18
2003	No increase in catches	14	14	14	-	17
2004	No increase in catches	14	14	11	-	14
2005	No increase in catches	14	14	13	-	16
2006	No increase in catches	14	15.4	15.2	-	19
2007	No fishing without a rebuilding plan*	-	13.8	12.6	-	18
2008	No fishing without a rebuilding plan*	-	11.6	10.2	-	13
2009	Same advice as last year	-	9.3	8.5	-	10
2010	Same advice as last year	-	7.4	7.5	-	10
2011	See scenarios	-	4.4	4.2	-	6.9
2012	Reduce catch	-	4.2	3.7	-	6.5
2013	No catches without a rebuilding plan	0				
2014	No catches without a rebuilding plan	0				

Weights in thousand tonnes.

* 2007 advice revised to be consistent with the single-stock exploitation boundaries.

Table 5.4.13.2

Herring in Divisions VIaS and VIIb,c. Official landings and ICES estimated catch (in tonnes).

Country	1989	1990	1991	1992	1993	1994	1995	1996
France	-	+	-	-	-	-	-	-
Germany, Fed.Rep.	-	-	-	250	-	-	11	-
Ireland	18 200	25 000	22 500	26 000	27 600	24 400	25 450	23 800
Netherlands	2 900	2 533	600	900	2 500	2 500	1 207	1 800
UK (N.Ireland)	-	80	-	-	-	-	-	-
UK (England + Wales)	-	-	-	-	-	50	24	-
UK Scotland	+	-	+	-	200	-	-	-
Total landings	21 100	27 613	23 100	27 150	30 300	26 950	26 692	25 600
Unallocated/ area misreported	7 100	13 826	11 200	4 600	6 250	6 250	1 100	6 900
Discards	1 000	2 530	3 400	100	250	700	-	-
ICES catch	29 200	43 969	37 700	31 850	36 800	33 900	27 792	32 500

Country	1997	1998	1999	2000	2001	2002	2003	2004
France	-	-	-	-	-	515	-	-
Germany, Fed.Rep.	-	-	-	-	-	-	-	-
Ireland	24 400	25 200	16 325	10 164	11 278	13 072	12 921	10 950
Netherlands	3 400	2 500	1 868	1 234	2 088	366	-	64
UK (N.Ireland)	-	-	-	-	-	-	-	-
UK (England + Wales)	-	-	-	-	-	-	-	-
UK Scotland	-	-	-	-	-	-	-	-
Total landings	27 800	27 700	18 193	11 398	13 366	13 953	12 921	11 014
Area misreported	-700	11 200	7 916	8 448	1 390	3 873	3 581	2 813
Unallocated								
Discards	50		-	-	-	-	-	-
ICES catch	27 150	38 900	26 109	19 846	14 756	17 826	16 502	13 827

Country	2005	2006	2007	2008	2009	2010	2011	2012
France	-	-	-	-	-	-	-	-
Germany, Fed.Rep.	-	-	-	-	-	-	-	-
Ireland	13 351	14 840	12 662	10 237	8 533	7 513	4 247	3 791
Netherlands	-	353	13	-	-	-	-	-
UK (N.Ireland)	-	-	-	-	-	-	-	-
UK (England + Wales)	-	-	-	-	-	-	-	-
UK Scotland	-	6	-	-	-	-	-	-
Total landings	13 351	15 199	12 675	10 237	8 533	7 513	4 247	3 791
Area misreported	2 880	4 353	5 129	3 103	1 935	2 728	2 672	2 780
Unallocated		-353	-13	-	-	-	-	-
Discards	-	-	-	-	-	-	-	-
ICES catch	16 231	19 193	17 791	13 340	10 468	10 241	6 919	6 571

Table 5.4.13.3

Herring in Divisions VIaS and VIIb,c. Summary of the exploratory assessment (ICA, including survey data from the Malin shelf acoustic survey).

Year	Recruitment	TSB	SSB	Fbar	Landings tonnes	Landings SOP
1957	149976	47132	21978	0.2945	5070	10 000
1958	280587	66075	23597	0.4187	6825	0.9996
1959	363725	79717	27248	0.3545	5226	10 002
1960	157083	64503	35478	0.1632	5401	0.9999
1961	201981	67403	34443	0.1783	6182	10 000
1962	330113	95449	44642	0.1939	7399	0.9995
1963	308011	102917	55090	0.1126	5059	10 005
1964	296615	109417	61422	0.1166	6169	0.9998
1965	1636705	282416	71667	0.1378	8016	0.9993
1966	233894	201674	140360	0.1878	12215	10 002
1967	474429	184590	101930	0.228	18881	10 003
1968	510336	197280	106054	0.1911	20731	0.9999
1969	346469	171715	101335	0.1945	19607	0.9999
1970	444323	173065	88483	0.2345	20306	11 150
1971	818663	278807	151341	0.1443	15044	11 491
1972	745054	277791	148753	0.202	23474	11 146
1973	499296	236556	131017	0.2877	36719	0.9834
1974	616217	216485	98894	0.4249	36589	10 243
1975	412893	190157	98716	0.3938	38764	0.8900
1976	782419	194629	66881	0.502	32767	0.9547
1977	635472	179740	75549	0.326	20567	0.9275
1978	987171	221707	76821	0.2649	19715	0.9842
1979	986530	258820	107014	0.2363	22608	0.9379
1980	622241	229870	113824	0.3506	30124	10 379
1981	686907	223043	107468	0.2642	24922	0.9698
1982	697142	229291	115502	0.2082	19209	0.9710
1983	2770018	478551	105254	0.3592	32988	0.9957
1984	1057929	397010	211256	0.1929	27450	10 320
1985	1210194	405464	232538	0.148	23343	10 154
1986	1020234	409686	253418	0.1662	28785	10 168
1987	3372908	642272	235164	0.3088	48600	10 538
1988	461544	461558	332418	0.2289	29100	10 008
1989	642258	391640	248469	0.1669	29210	0.9988
1990	853240	338571	187241	0.2499	43969	0.9991
1991	524697	282428	177468	0.2324	37700	10 031
1992	413360	217124	133623	0.2795	31856	10 052
1993	623830	234789	116112	0.3759	36763	0.9939
1994	806286	206897	88239	0.3837	33908	10 020
1995	448764	158766	83953	0.4294	27792	0.9501
1996	896472	179027	66009	0.5552	32534	10 045
1997	859204	178775	66286	0.5297	27225	0.9985
1998	544263	148271	56196	0.974	38895	10 013
1999	423410	121646	48730	0.6693	26109	0.9982
2000	469847	110852	42333	0.4898	19846	0.9989
2001	479829	102546	41313	0.4496	14756	10 013
2002	550071	109779	39148	0.5383	17826	10 008
2003	472256	106161	42223	0.4886	16502	0.9979
2004	480194	100689	44471	0.4099	13727	0.9994
2005	518674	111476	43196	0.4383	16231	10 013
2006	331451	92191	40425	0.6859	19193	0.9989
2007	157861	69024	32897	0.5869	17791	10 000
2008	234132	60845	24400	0.5673	13340	10 001
2009	217811	51398	24177	0.5011	10468	10 014
2010	463138	73984	20734	0.5423	10241	0.9992
2011	640329	90674	27994	0.3554	6919	10 003
2012	473928	1814346	50924	0.1437	6571	10 004

Table 5.4.13.4

Herring in Divisions VIaS and VIIb,c. Summary of the exploratory assessment (SVPA).

Year	Recruitment	SSB	Landings	FBar
1957	175035	29604	5070	0.2237
1958	334545	29246	6825	0.3183
1959	483127	38618	5226	0.2011
1960	262908	51660	5401	0.0943
1961	207384	52632	6182	0.1181
1962	286854	56939	7399	0.1323
1963	311539	68642	5059	0.0838
1964	295696	70265	6169	0.0894
1965	2398901	76202	8016	0.1252
1966	165998	186353	12215	0.1954
1967	467097	111919	18881	0.2289
1968	544310	154698	20731	0.1685
1969	350895	142235	19607	0.1685
1970	406447	131405	20306	0.1917
1971	821830	115527	15044	0.1678
1972	739502	118711	23474	0.2031
1973	538189	136269	36719	0.2835
1974	593233	93965	36589	0.4443
1975	412251	88800	38764	0.4299
1976	695167	66526	32767	0.4882
1977	583445	73229	20567	0.3101
1978	1068757	73157	19715	0.2565
1979	994125	100768	22608	0.2651
1980	541049	107024	30124	0.3812
1981	683312	101506	24922	0.3022
1982	711052	112140	19209	0.2184
1983	2341228	110910	32988	0.3506
1984	970610	193053	27450	0.1992
1985	1238781	194278	23343	0.1672
1986	951309	229871	28785	0.1774
1987	3238964	208289	48600	0.337
1988	481007	304341	29100	0.2655
1989	716019	226952	29210	0.1794
1990	809513	196016	43969	0.2571
1991	502888	169160	37700	0.2419
1992	415472	135537	31856	0.2737
1993	616187	114926	36763	0.3543
1994	802983	96314	33908	0.362
1995	457753	79903	27792	0.4676
1996	831805	62879	32534	0.5825
1997	820655	63944	27225	0.5358
1998	526653	52302	38895	1.031
1999	386516	44466	26109	0.7026
2000	436156	37018	19846	0.5305
2001	444252	34287	14756	0.638
2002	543141	32738	17826	0.7089
2003	445267	37385	16502	0.6525
2004	460864	39159	13727	0.5957
2005	503977	38816	16231	0.6097
2006	279962	36402	19193	0.8687
2007	141074	28294	17791	0.6784
2008	182609	19600	13340	0.7129
2009	116490	17600	10468	0.6875
2010	196498	10964	10241	0.897
2011	159239	9461	6919	1.1766
2012	498780*	11588	6571	0.6583
Mean	498780	93295	21558	0.3927

* Geometric mean recruitment 1957-2011.