Herring (*Clupea harengus*) in subdivisions 25–29 and 32, excluding the Gulf of Riga (central Baltic Sea). Replacing advice provided in May 2023

ICES advice on fishing opportunities

Please note: The present advice replaces the advice given in May 2023 for catches in 2023

ICES advises that when the EU multiannual plan (MAP) for the Baltic Sea is applied, catches in 2024 that correspond to the F ranges in the plan are between 41 706 (corresponding to $F_{MSY\ lower} \times SSB_{2024}/MSY\ B_{trigger}$) and 52 549 * tonnes (corresponding to $F_{MSY} \times SSB_{2024}/MSY\ B_{trigger}$). The current advice applies to all catches from the stock, including those taken in Subdivision 28.1.

ICES advice on conservation aspects

ICES has not identified any conservation aspects.

Stock development over time

Fishing pressure on the stock is below F_{MSY} and spawning-stock size is below MSY $B_{trigger}$, B_{pa}, and B_{lim}.

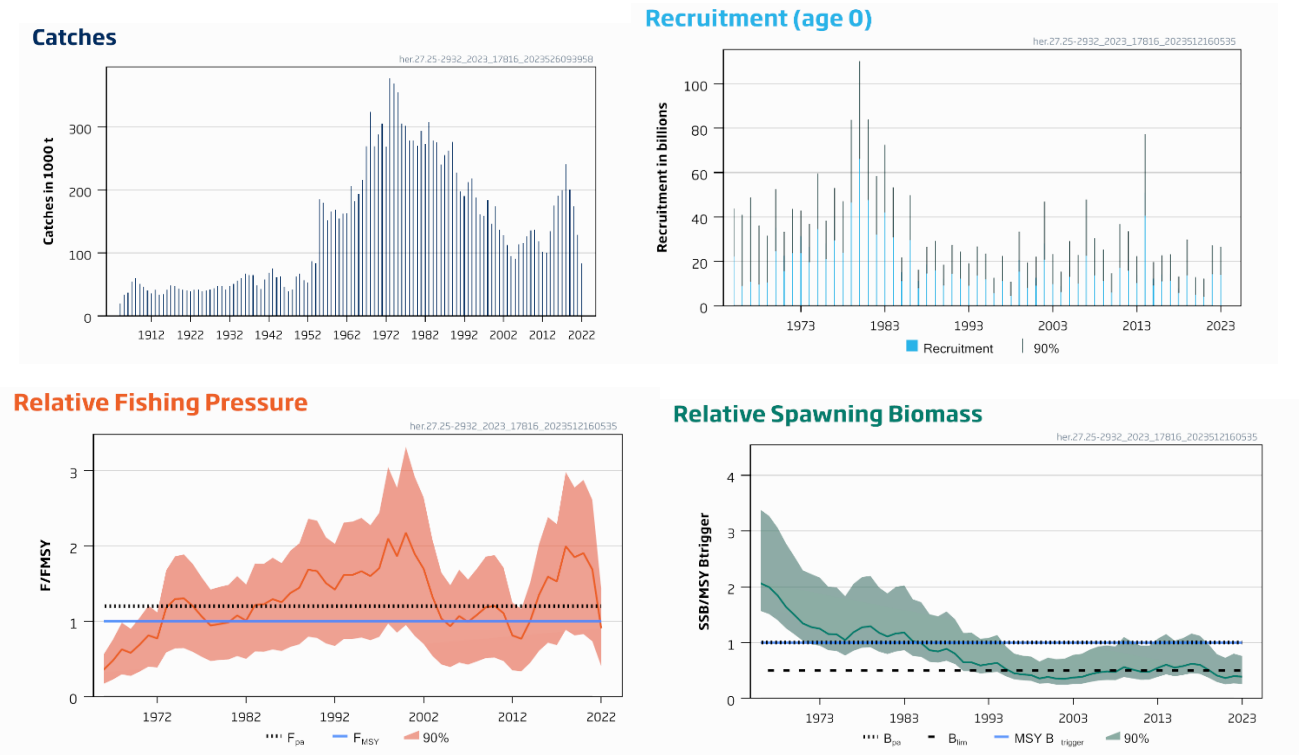

Figure 1 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Summary of the stock assessment. The full time series of Recruitment, Fishing Pressure and Spawning Stock Biomass are available in the working group report (Table 4.2.11, ICES, 2023a)

Conservation status

ICES is not aware of any information on stock/species-specific conservation status.

* A typo was corrected. Advised catches corresponding to $F_{MSY} \times SSB_{2024}/MSY\ B_{trigger}$ were updated from 52 459 to 52 549 tonnes.

Catch scenarios

Table 1 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Values in the forecast and for the interim year.

Variable	Value	Notes
F_{2023}/F_{MSY}	1.13	Relative value. Based on a catch of 100 239 for 2023*
SSB_{2024}/MSY $B_{trigger}$	0.46	Relative value; short-term forecast
$R_{age\ 0}$ (2023–2025)	18.5	Beverton and Holt stock–recruitment function with autocorrelation; billions
Total catch (2023)	100 239	Catch constraint in 2023: EU share (70 822 tonnes) + Russian Federation quota (27 000 tonnes) + central Baltic herring stock caught in Gulf of Riga (3 211 tonnes [mean 2017–2021]) − Gulf of Riga herring stock caught in central Baltic Sea (794 tonnes [mean 2017–2021]); tonnes

Table 2 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2024)	Fishing mortality F_{2024}/F_{MSY}	SSB_{2025}/MSY $B_{trigger}$	% probability of SSB(2025) < B_{lim}^	Probability of SSB (2025) < MSY $B_{trigger}$(%)^	% SSB change*	% advice change **
ICES advice basis							
EU MAP^^: F = F_{MSY} × SSB_{2024}/MSY $B_{trigger}$	52 549	0.46	0.60	31	92	29	−45
EU MAP^^: F = MAP range F_{lower} × SSB_{2024}/MSY $B_{trigger}$	41 706	0.36	0.61	29	91	31	−41
Other scenarios							
F = 0	0	0.00	0.64	22	88	39	−100
F_{MSY}	108 434	1.0	0.55	40	95	19	13
F_{lower}	82 577	0.75	0.57	35	94	24	18
F_{upper}	126 785	1.21	0.54	43	96	15	33
EU MAP^^: F = MAP range F_{upper} × SSB_{2024}/MSY $B_{trigger}$	62 558	0.56	0.59	33	93	27	−35
F = F_{pa} × SSB_{2024}/MSY $B_{trigger}$	62 558	0.56	0.59	33	93	27	−35
SSB (2025) = B_{lim}	166 822	1.66	0.50	49	98	−0.54	74
SSB (2025) = B_{pa}##							
SSB (2025) = MSY $B_{trigger}$ ##							
SSB (2025) = SSB (2024)	208 527	2.20	0.47	56	99	−1.6#	118
F = F_{2023}	116 775	1.103	0.55	40	96	15	22

* SSB 2025 relative to SSB 2024.

** Advice values for 2024 relative to the corresponding 2023 values (EU MAP advice of 95 643 [F_{MSY}], 95 643 [F_{upper}] and 70 130 [F_{lower}] tonnes, respectively; other values are relative to 95 643 tonnes).

^ The probability of SSB being below SSB reference points in 2025. This probability relates to the short-term probability of SSB < B_{lim} and MSY $B_{trigger}$ and is not comparable to the long-term probability of SSB < B_{lim} and MSY $B_{trigger}$ tested in simulations when estimating fishing mortality reference points.

^^ MAP multiannual plan (EU, 2016, 2019, 2020).

Based on stochastic forecasts, using the F with two decimals to get close to the biomass target.

The B_{pa} and MSY $B_{trigger}$ options were left blank because B_{pa} and MSY $B_{trigger}$ cannot be achieved in 2025, even with zero catch in 2024.

The decreased catch advice is mainly due to the use of the new reference points derived in the benchmark. Both the F and SSB reference points have increased, while current relative levels of fishing mortality and SSB have remained similar. In particular, the increase in MSY $B_{trigger}$ results in a large reduction in advised fishing mortality when F_{MSY} is multiplied with the $SSB/MSY_{Btrigger}$ ratio.

Basis of the advice

Table 3 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. The basis of the advice.

Advice basis	EU Baltic MAP
Management plan	This stock is shared between the EU and Russian Federation. An EU MAP in place for stocks in the Baltic Sea includes herring (EU, 2016, 2019, 2020). The advice, based on the F_{MSY} ranges used in the management plan, is considered precautionary. Russian Federation does not have a management plan for this stock.

Quality of the assessment

The stock was benchmarked in 2023, which resulted in a new assessment model and updated maturity and natural mortality estimates. In order to account for uncertainty in natural mortality, an ensemble of three models was developed. The stock development is similar to the previous assessment. The new model includes uncertainty estimates for F, SSB, and recruitment.

In ensemble models, fractions of B_{MSY} or B_0 are usually used to define B_{lim} to ensure consistency across all ensemble elements. In this case, B_0, defined as the unexploited SSB at current conditions, was used, since it has the advantage of being independent of selectivity. For the selection of the percentage, several factors were considered: previously-used value (ICES, 2022); allee-effects (i.e depensation), estimated to occur at 10% of B_0; and values used in other regions (40% and 50% B_{MSY} in Canada and US, corresponding to 78% and 98% B_0 in this case).

Species misreporting of herring and sprat has occurred in the past, and there is evidence that this is an ongoing problem. These effects have been neither quantified nor included in the assessment due to lack of access to representative data. Considerable effort was made before the benchmark to estimate levels of misreporting, resulting in minor revisions to the catch time-series; but the work was not finalized and is still ongoing. Misreporting undermines the data quality used in the assessment and introduces a level of uncertainty in the assessment and advice that cannot be quantified.

No information on Russian Federation catches for 2022 was officially reported to ICES. Therefore, the Russian Federation catch amount for 2022 included in the assessment was based on publically available information. No biological information on composition of these catches was available to ICES. The age composition from other countries was used to estimate Russian Federation data. The age compositions in previous years among countries were similar, but not identical; and using composition data from other years was considered unacceptable. Therefore, because strong year classes propagate into other age groups changing age distribution, using composition data from other countries was considered the best solution. Russian Federation catches account for around 25% of the total catches, and the impact on the quality of the assessment cannot be quantified.

Issues relevant for the advice

The fishing mortality and biomass reference points were updated at the benchmark. These are now presented as relative rather than absolute values. This has resulted in a change in the perception of stock status, with SSB currently estimated to be below B_{lim}.

The EU MAP states, “Fishing opportunities shall in any event be fixed in such a way as to ensure that there is less than a 5% probability of the spawning stock biomass falling below B_{lim}”. Even a zero catch in 2024 will not bring the stock above B_{lim} in 2025 with 95% probability.

A mixture of central Baltic herring (subdivisions 25–27, 28.2, 29, and 32) and Gulf of Riga herring (Subdivision 28.1) is caught in the central Baltic Sea. In the assessment and the advice, the central Baltic herring stock is considered to be caught both in and outside of the central Baltic Sea. The TAC (sum of the EU and Russian Federation autonomous quotas) is set for herring caught in the central Baltic management area; it includes a small amount of Gulf of Riga herring caught in the central Baltic Sea but excludes central Baltic herring caught outside of the central Baltic Sea.

An example of how TAC setting could address the stock mixing issues is presented based on the ICES MSY approach advice catch for the central Baltic herring stock (52 549 tonnes), plus the assumed catch of Gulf of Riga herring taken in the central

Baltic, minus the assumed catch of central Baltic herring taken in the Gulf of Riga. The values of the two latter figures are given by the average over the last five years.

- Central Baltic herring assumed to be taken in the Gulf of Riga in 2024 (Subdivision 28.1) is 2 959 tonnes (average 2018–2022).
- Gulf of Riga herring assumed to be taken in Subdivision 28.2 in 2024 is 902 tonnes (average 2018–2022).

As an example, following ICES MSY approach (here identical to the MAP F_{MSY}), catches from the central Baltic herring stock in 2024 should be no more than 52 549 tonnes. The corresponding TAC in the central Baltic management area for 2024 would be calculated as: 52 549 tonnes + 902 tonnes − 2 959 tonnes = 50 492 tonnes. This would result in an TAC decrease of 52%.

The Central Baltic herring stock consists of several different spawning components that have been shown to be genetically distinct. Differences in genetics and migration routes between spawning components, and spatial differences in growth and maturity, make the Central Baltic herring stock complex vulnerable to loss in both genetic diversity and overall productivity. The current advice does not account for differences in the productivity of the various stock components.

Reference points

Table 4 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	$B_{30\%}$	Relative value. Set at 30% of B_0*. Determined through management strategy evaluation with the objective to achieve high sustainable yields without exceeding a 5% probability of SSB falling below B_{lim} in any single year.	ICES (2023a)
	F_{MSY}	$F_{B30\%}$	Relative value. Set as the F which will achieve 30% of B_0. Determined through management strategy evaluation with the objective to achieve high sustainable yields without exceeding a 5% probability of SSB falling below B_{lim} in any single year.	ICES (2023a)
Precautionary approach	B_{lim}	0.15 x B_0	Relative value. Set at 15% of B_0.	ICES (2023b)
	B_{pa}=MSY $B_{trigger}$	$B_{30\%}$	Relative value. Set at 30% of B_0.Determined through management strategy evaluation with the objective to achieve high sustainable yields without exceeding a 5% probability of SSB falling below B_{lim} in any single year.	ICES (2023a)
	F_{pa}	$F_{B25\%}$**= F_{MSY}*1.21	F_{P05}. Relative value. Determined through management strategy evaluation. The F that leads to SSB ≥ B_{lim} with 95% probability.	ICES (2023a)
Management plan	MAP MSY $B_{trigger}$	$B_{30\%}$	MSY $B_{trigger}$	ICES (2023a)
	MAP B_{lim}	0.15 x B_0	B_{lim}	ICES (2023a)
	MAP F_{MSY}	$F_{B30\%}$	F_{MSY}	ICES (2023a)
	MAP target range F_{lower}	$F_{B40\%}$ = F_{MSY}*0.75	Relative value. Determined through management strategy evaluation, consistent with the ranges that result in no more than a 5% reduction in long-term yield compared to MSY.	ICES (2023a)
	MAP target range F_{upper}	$F_{B25\%}$**= F_{MSY}*1.21	Relative value. Determined through management strategy evaluation, consistent with the ranges that result in no more than a 5% reduction in long-term yield compared to MSY. Capped to F_{P05}.	ICES (2023a)

* B_0 is the estimated unexploited spawning biomass at current conditions (average biological parameters for the last 10 years).
** Determined from the management strategy evaluation. To be precautionary, this reference point can only be used with the MSY $B_{trigger}$.

Basis of the assessment

Table 5 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2023c)
Assessment type	Age-based analytical assessment SS (ICES, 2023a) that uses catches in the model and in the forecast. An ensemble of three models is used where each model differs based on the assumed level of natural mortality.
Input data	Commercial catches (international landings, age distributions from catch sampling); one survey acoustic index (BIAS A1588); natural mortalities from multispecies model (SMS) until 2021, 2022 = 2021. Catches for Russian Federation since 2022 are taken from AtlantNIRO (2023a).
Discards and bycatch	Discarding is considered negligible
Indicators	None
Other information	Benchmark in 2023 (ICES, 2023b). Information on Russian Federation TAC for 2023 is taken from AtlantNIRO (2023b).
Working group	Baltic Fisheries Assessment Working Group (WGBFAS)

History of the advice, catch, and management

Table 6 Herring in subdivisions (SDs) 25–29 and 32, excluding the Gulf of Riga. ICES advice, TACs, and catches. All weights are in tonnes.

Year	ICES advice	Catch corresponding to the advice	Agreed TAC	ICES catch SDs 25–29 and 32	ICES catch
1988*		204 000	399 000**	286 000	
1989*		176 000	399 000**	290 000	
1990*		112 000	399 000**	244 000	
1991*	TAC for the entire area	293 000	402 000**	213 000	
1992*	F near present level	343 000	402 000**	210 000	
1993*	Increase in yield at higher F	371 000	560 000**	231 000	
1994*	Increase in yield at higher F	317 000–463 000	560 000**	242 000	
1995*	TAC	394 000	560 000**	221 000	
1996*	TAC	394 000	560 000**	195 000	
1997*	No advice	-	560 000**	208 000	
1998*	No advice	-	560 000**	212 000	
1999*	Proposed F_{pa} = (0.17)	117 000	476 000**	178 000	
2000*	Proposed F_{pa} = (0.17)	95 000	405 000**	208 000	
2001*	Proposed F_{pa} = (0.17)	60 000	300 000**	188 000	
2002*	$F < F_{pa}$	< 73 000	Not agreed**	168 000	
2003*	$F < F_{pa}$	< 72 000	143 000**	154 000	
2004	$F < F_{pa}$	< 80 000	171 000**		95 151
2005	$F < F_{pa}$ (single-stock exploitation boundaries)	< 130 000	130 000***		91 069
2006	$F < F_{pa}$ (single-stock exploitation boundaries)	< 120 000	128 000***		113 401
2007	$F < F_{pa}$ (single-stock exploitation boundaries)	< 164 000	133 000^		115 790
2008	$F < F_{pa}$ (single-stock exploitation boundaries)	< 194 000	153 000^		126 363
2009	$F < F_{pa}$ (single-stock exploitation boundaries)	< 147 000	143 609^		135 647

Year	ICES advice	Catch corresponding to the advice	Agreed TAC	ICES catch SDs 25–29 and 32	ICES catch
2010	$F < F_{pa}$ (single-stock exploitation boundaries)	< 103 000	139 776^^		137 189
2011	MSY framework (F = 0.19)	< 95 000	120 020^^		118 563
2012	MSY transition ($F = F_{pa} = 0.19$)	< 92 000	93 317^^		101 546
2013	MSY transition ($F = F_{pa} = 0.19$)	< 117 000	101 480^^		100 484
2014	MSY approach	< 164 000	132 225^^		134 482
2015	MSY approach ($F_{MSY} = 0.26$)	< 193 000	186 351^^		174 946
2016	MSY approach ($F_{MSY} = 0.22$)	≤ 201 000	206 605^^		190 641
2017	MSY approach ($F_{MSY} = 0.22$)	≤ 216 000	220 629^^		199 428
2018	MAP target F ranges: F_{lower} to F_{upper} (0.16–0.28), but F higher than $F_{MSY} = 0.22$ only under conditions specified in MAP	200 236–331 510 but catch higher than 267 745 only under conditions specified in MAP	258 855^^		240 739
2019	MAP target F ranges: F_{lower} to F_{upper} (0.16–0.28), but F higher than $F_{MSY} = 0.22$ only under conditions specified in MAP	115 591–192 787 but catch higher than 155 333 only under conditions specified in MAP	200 260^^		200 957
2020	MAP target F ranges: F_{lower} to F_{upper} (0.16–0.28), but F higher than $F_{MSY} = 0.22$ only under conditions specified in MAP	130 546–214 553 but catch higher than 173975 only under conditions specified in MAP	182 484^^		174 520
2021	Management Plan	111 852 (range 83 971–138 183)	126 051^^		128 961
2022	Management Plan	71 939 (range 52 443–87 581)	80 753^^		83 411^^^
2023	Management Plan	95 643 (range 70 130–95 643)	97 822^^		
2024	Management Plan	52 549 (range 41 706–52 549)			

* 1987–2003 including Gulf of Riga herring.
** TAC for subdivisions 22–29Sand 32.
*** TAC for subdivisions 25–28.2, 29, and 32.
^ EU TAC for subdivisions 25–28.2, 29, and 32.
^^ TAC is calculated as EU (subdivisions 25–28.2, 29, and 32) + Russian Federation autonomous quotas.
^^^ Russian Federation landings were not officially reported to ICES, but an estimate is included.

History of the catch and landings

Table 7 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Catch distribution by fleet as estimated by ICES.

Total herring catch in the central Baltic management area (2022)	Total catch of stock (2022)	Landings	Discards
80 775 tonnes	83 411 tonnes	Mainly pelagic trawls. Minor part taken by trapnets, gillnets, and purse-seines 83 400 tonnes	Negligible (0.01 %)

Table 8 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. History of commercial catch and landings; official catches are presented for each country participating in the fishery. All weights are in tonnes.

Year	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Russia	Sweden	USSR	Total
1977	11 900		33 700				57 200		48 700	112 814	264 314
1978	13 900		38 300	100			61 300		55 400	113 872	282 872
1979	19 400		40 400				70 400		71 300	100 958	302 458
1980	10 600		44 000				58 300		72 500	103 002	288 402
1981	14 100		42 500	1 000			51 200		72 900	93 431	275 131
1982	15 300		47 500	1 300			63 000		83 800	86 423	297 323
1983	10 500		59 100	1 000			67 100		78 600	69 059	285 359
1984	6 500		54 100				65 800		56 900	89 757	273 057
1985	7 600		54 200				72 800		42 500	95 225	272 325
1986	3 900		49 400				67 800		29 700	98 773	249 573
1987	11 003		50 400				55 500		25 400	100 916	243 219
1988	17 618		58 100				57 200		33 400	106 009	272 327
1989	7 878		50 000				51 800		55 400	105 017	270 095
1990	3 641		26 900				52 300		44 200	101 269	228 310
1991	6 723	27 036	18 100		20 709	6 500	47 100	31 900	36 500		194 568
1992	8 568	22 264	30 000		12 533	4 600	39 200	29 500	43 000		189 665
1993	11 858	25 420	32 300		9 576	3 000	41 100	21 600	66 400		211 254
1994	11 106	26 345	38 200	3 700	9 797	4 900	46 100	16 700	61 600		218 447
1995	10 651	30 681	31 400		9 328	3 600	38 700	17 000	47 200		188 560
1996	10 718	35 943	31 502		11 569	4 243	30 712	14 626	25 909		165 222
1997	8 451	42 585	23 749		10 140	3 324	26 229	12 526	44 078		171 082
1998	12 236	34 005	24 777		9 972	2 368	19 344	10 520	70 997		184 220
1999	5 980	35 437	17 850		8 292	1 312	18 121	12 676	48 866		148 534
2000	14 441	30 135	23 330		6 718	1 070	23 066	14 814	60 161		173 735
2001	4 462	27 425	26 103		5 217	1 639	28 358	15 797	29 832		138 832
2002	3 679	21 010	25 724	291	3 917	1 537	28 510	14 168	29 423		128 260
2003	3 873	13 300	14 698	3 860	3 132	2 060	26 311	13 363	31 785		112 381
2004	2 320	10 912	14 468	4 323	2 655	1 778	22 834	6 526	29 336		95 151
2005	2 555	10 783	6 410	3 713	1 951	748	18 476	7 007	39 426		91 069
2006	3 301	13 400	9 600	3 200	3 000	1 200	16 800	7 600	55 300		113 401
2007	1 112	13 979	13 890	1 672	3 212	3 474	19 802	8 772	49 879		115 790
2008	1 458	21 581	19 134	3 358	3 520	1 749	13 331	8 551	53 681		126 363
2009	2 995	19 937	23 329	1 252	4 108	3 576	18 441	11 800	50 208		135 647
2010	5 851	17 915	21 602	2 235	3 903	1 492	25 028	9 126	50 037		137 189
2011	3 627	14 924	19 229	2 730	3 432	1 997	27 998	8 471	36 156		118 563
2012	2 049	11 380	18 049	896	2 637	1 847	25 472	13 044	26 153		101 546
2013	2 949	12 601	18 175	1 415	3 548	1 724	20 568	10 046	29 458		100 484
2014	4 505	15 334	27 905	1 731	4 853	2 096	27 316	15 854	34 888		134 482
2015	844	18 782	31 571	2 917	5 657	4 694	39 024	20 889	50 568		174 946
2016	2 626	20 097	28 852	4 340	8 362	5 184	40 990	24 179	56 011		190 641
2017	6 253	23 320	40 692	3 594	7 912	4 037	40 102	22 327	51 191		199 428
2018	7 741	24 269	45 363	3 951	11 187	6 564	49 280	25 437	66 946		240 739
2019	5 371	21 485	37 037	1 752	7 620	6 085	40 271	25 759	55 577		200 957
2020	6 717	17 074	31 890	833	5 241	5 558	35 879	26 039	45 289		174 520
2021	6 625	1 2521	1 9822	631	3 828	4 338	26 695	23 744	30 757		128 961
2022*	2 056	7 675	10 276	250	4 180	1 753	17 754	24 909**	14 559		83411

* Preliminary.

** Russian Federation landings were not officially reported to ICES.

Table 9 Herring in subdivisions 25–29 and 32 (excluding Gulf of Riga herring). Catches (in tonnes) from the central Baltic management area and of the central Baltic stock.

Year	Catches of herring from the central Baltic area			Central Baltic herring stock catches	
	Central Baltic herring stock	Gulf of Riga herring stock	Total	Central Baltic herring caught in the Gulf of Riga	Total catch of central Baltic herring stock
1977	261 900	-	261 900	2 400	264 300
1978	276 600	-	276 600	6 300	282 900
1979	297 800	-	297 800	4 700	302 500
1980	282 700	-	282 700	5 700	288 400
1981	269 200	-	269 200	5 900	275 100
1982	292 600	-	292 600	4 700	297 300
1983	280 600	-	280 600	4 800	285 400
1984	269 300	-	269 300	3 800	273 100
1985	267 700	-	267 700	4 600	272 300
1986	248 300	-	248 300	1 300	249 600
1987	238 419	-	238 419	4 800	243 219
1988	269 327	-	269 327	3 000	272 327
1989	264 195	-	264 195	5 900	270 095
1990	222 310	-	222 310	6 000	228 310
1991	188 468	-	188 468	6 100	194 568
1992	186 165	1 300	187 465	3 500	189 665
1993	206 954	1 200	208 154	4 300	211 254
1994	213 447	2 100	215 547	5 000	218 447
1995	182 460	2 400	184 860	6 100	188 560
1996	160 822	4 300	165 122	4 400	165 222
1997	166 782	2 900	169 682	4 300	171 082
1998	180 120	2 800	182 920	4 100	184 220
1999	144 234	1 900	146 134	4 300	148 534
2000	169 135	1 900	171 035	4 600	173 735
2001	135 962	1 153	137 115	2 870	138 832
2002	124 792	400	125 192	3 468	128 260
2003	108 131	359	108 490	4 250	112 381
2004	91 817	193	92 010	3 334	95 151
2005	88 815	510	89 325	2 254	91 069
2006	110 247	398	110 644	3 154	113 401
2007	114 304	125	114 429	1 486	115 790
2008	120 260	144	120 403	6 103	126 363
2009	130 782	112	130 894	4 865	135 647
2010	131 983	432	132 415	5 206	137 189
2011	113 092	85	113 177	5 472	118 563
2012	97 762	166	97 928	3 784	101 546
2013	96 381	254	96 635	4 103	100 484
2014	129 947	162	130 109	4 535	134 482
2015	169 978	316	170 294	4 968	174 946
2016	186 326	289	186 615	4 315	190 641
2017	195 532	234	195 766	3 896	199 428
2018	236 531	530	237 061	4 208	240 739
2019	197 397	1 200	198 597	3 560	200 957
2020	173 256	1 229	174 485	1 264	174 520
2021	125 835	775	126 610	3 126	128 961
2022*	80 775	777	81 552	2 636	83 411**

* Preliminary.

**Russian Federation landings were not officially reported to ICES.

Summary of the assessment

Table 10 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Assessment summary. Weights are in tonnes. Recruitment in thousands. The full time series (since 1904) of catches, Recruitment, SSB and Fishing pressure are available in the working group report (Table 4.2.11, ICES, 2023a)

Year	Recruitment			SSB relative to MSY $B_{trigger}$*			Total	Fishing pressure relative to F_{MSY}		
	Age 0	5%	95%	SSB	5%	95%	Catch	Ages 3–6	5%	95%
	thousands						tonnes			
1966	18625725	9074727	40770609	2.06	1.57	3.38	216123	0.36	0.17	0.57
1967	22325971	11048324	48609640	1.99	1.51	3.27	269141	0.48	0.22	0.76
1968	18286801	9719920	35966928	1.85	1.40	3.06	323765	0.63	0.29	0.98
1969	18154277	10647828	31429605	1.64	1.25	2.78	269536	0.58	0.27	0.90
1970	35184510	24750208	52371798	1.49	1.15	2.54	288626	0.69	0.33	1.05
1971	22477928	15738804	33182866	1.34	1.03	2.30	305211	0.81	0.40	1.21
1972	31375767	23849288	43481920	1.28	0.97	2.23	268832	0.77	0.38	1.12
1973	31288810	23853819	42757115	1.25	0.94	2.17	376787	1.18	0.58	1.68
1974	26423215	19775790	36706072	1.15	0.86	2.00	368652	1.30	0.64	1.86
1975	44219717	34671530	59374288	1.15	0.85	1.99	354851	1.30	0.64	1.89
1976	27907780	21155029	38201703	1.05	0.77	1.83	305420	1.20	0.59	1.76
1977	40149580	29600688	52889347	1.19	0.85	2.06	301952	1.06	0.53	1.58
1978	34263135	24013104	46911041	1.27	0.91	2.18	278966	0.94	0.47	1.42
1979	64016248	46685631	83580233	1.29	0.92	2.20	278182	0.96	0.49	1.46
1980	88476138	66316277	110012786	1.18	0.84	1.99	270282	0.98	0.49	1.48
1981	64533241	47834448	83668921	1.11	0.79	1.88	293615	1.08	0.54	1.60
1982	43460852	32247152	58260263	1.16	0.84	2.00	273134	1.01	0.50	1.49
1983	54945098	42199644	72330587	1.18	0.86	2.03	307601	1.22	0.60	1.77
1984	39468751	30959722	53144474	1.02	0.76	1.78	277926	1.23	0.59	1.76
1985	15185333	11217469	21659336	0.99	0.74	1.73	275760	1.29	0.62	1.85
1986	37055976	29726061	49698835	0.86	0.65	1.51	240516	1.25	0.60	1.77
1987	11099407	8035085	16072517	0.84	0.64	1.47	255498	1.38	0.66	1.94
1988	18574883	14626325	26385983	0.89	0.67	1.56	262558	1.45	0.69	2.04
1989	19954671	16048058	29087479	0.80	0.62	1.42	276066	1.69	0.79	2.36
1990	12166855	9304249	18317242	0.65	0.49	1.17	227617	1.67	0.78	2.34
1991	18289199	14540344	27210024	0.64	0.49	1.18	197610	1.51	0.70	2.12
1992	16260620	12348600	24218123	0.59	0.45	1.07	190258	1.42	0.67	2.03
1993	12554010	9186150	18937906	0.61	0.46	1.09	212101	1.61	0.76	2.31
1994	17748613	13803611	26529386	0.64	0.48	1.14	218116	1.62	0.76	2.33
1995	15421515	12119648	23281828	0.53	0.40	0.94	187409	1.67	0.78	2.37
1996	7926350	5891571	12410528	0.45	0.34	0.80	161148	1.60	0.75	2.28
1997	14228926	11304039	22234740	0.43	0.32	0.77	159056	1.71	0.79	2.44
1998	6388314	4584772	10660377	0.42	0.31	0.75	184140	2.10	0.97	3.05
1999	20475594	15532198	33230264	0.36	0.26	0.66	145717	1.86	0.85	2.78
2000	11226759	8174589	19358619	0.39	0.27	0.73	174301	2.18	0.95	3.32

Year	Recruitment			SSB relative to MSY $B_{trigger}$*			Total	Fishing pressure relative to F_{MSY}		
	Age 0	5%	95%	SSB	5%	95%	Catch	Ages 3–6	5%	95%
	thousands						tonnes			
2001	12599455	9208477	21960613	0.36	0.25	0.70	137080	1.89	0.80	2.92
2002	27869672	20894866	46766395	0.35	0.24	0.71	128344	1.70	0.70	2.65
2003	13518238	9913351	23133243	0.37	0.26	0.78	112118	1.32	0.54	2.08
2004	8801829	6311547	15236998	0.38	0.26	0.80	95151	1.04	0.42	1.65
2005	17777588	13180450	28974099	0.43	0.29	0.88	91094	0.93	0.39	1.48
2006	13788774	10115298	22732986	0.47	0.32	0.93	113536	1.07	0.45	1.69
2007	30396758	22696418	47668762	0.48	0.33	0.95	115790	0.99	0.42	1.56
2008	18967581	13879880	30248509	0.47	0.33	0.93	126363	1.08	0.47	1.70
2009	15542150	11340902	25085740	0.56	0.38	1.10	135659	1.19	0.51	1.86
2010	8567558	6091638	14426745	0.52	0.36	1.01	137189	1.20	0.52	1.88
2011	22906474	17284978	36671337	0.48	0.33	0.95	118563	1.11	0.47	1.71
2012	20988774	15930346	33405842	0.48	0.34	0.94	101526	0.81	0.35	1.25
2013	13879268	10385539	22206107	0.55	0.39	1.07	100484	0.77	0.33	1.16
2014	50982828	40696516	77162569	0.60	0.43	1.15	134482	1.00	0.45	1.51
2015	12101986	9291211	19549898	0.55	0.40	1.04	174945	1.35	0.61	2.03
2016	14026097	11099004	22594426	0.58	0.42	1.08	190641	1.59	0.71	2.39
2017	14188278	11384676	23055729	0.62	0.45	1.16	199428	1.53	0.68	2.29
2018	7751012	5927039	12998488	0.60	0.44	1.12	240738	2.00	0.88	2.99
2019	17735135	13821757	29667794	0.51	0.37	0.98	200956	1.85	0.81	2.78
2020	7263307	5093283	12717947	0.41	0.29	0.80	174521	1.91	0.83	2.88
2021	6653760	4186745	12014436	0.37	0.25	0.73	128961	1.69	0.73	2.61
2022	18711032	14370833	27005779	0.40	0.27	0.80	83411**	0.91	0.40	1.44
2023	18544632	14101051	26420268	0.39	0.26	0.76				

* 1 January.
** Russian Federation landings were not officially reported to ICES.

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