

Sprat (*Sprattus sprattus*) in subdivisions 22–32 (Baltic Sea)

ICES advice on fishing opportunities

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 191 075 tonnes and 247 704 tonnes. According to the MAP, catches higher than those corresponding to F_{MSY} (241 604 tonnes) can only be taken under conditions specified in the plan, whilst the entire range is considered precautionary when applying ICES advice rule.

ICES advice on conservation aspects

ICES has not identified any conservation aspects.

Stock development over time

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

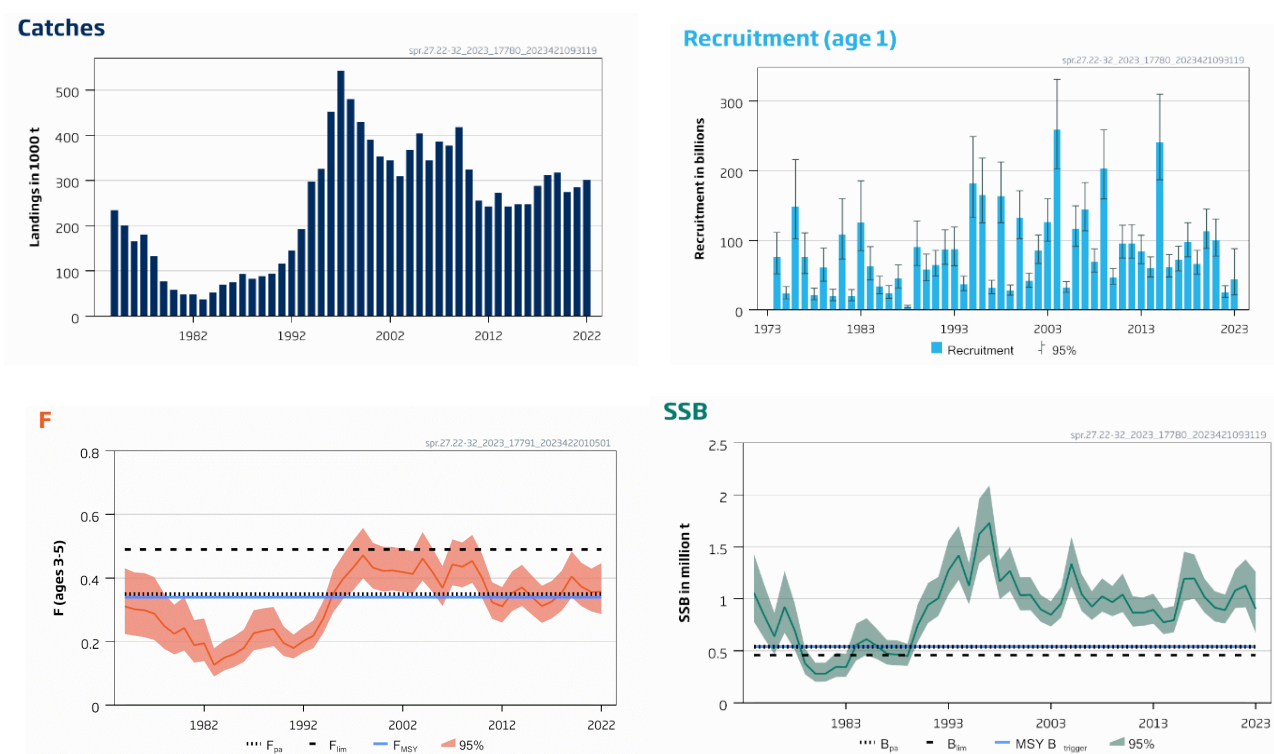


Figure 1 Sprat in subdivisions 22–32. Summary of the stock assessment. SSB at spawning time is predicted for 2023.

Conservation status

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

Catch scenarios

Table 1 Sprat in subdivisions 22–32. Values in the forecast and for the interim year.

Variable	Value	Notes
$F_{\text{ages 3–5}}$ (2023)	0.35	Based on catch of 269 200 tonnes
SSB (2023)	903 773	Predicted SSB at spawning time; tonnes
$R_{\text{age 1}}$ (2023)	43 773	From the assessment; millions
$R_{\text{age 1}}$ (2024–2025)	86 918	Median recruitment, resampled from the years 1991–2022; millions
Total catch (2023)	269 200	Catch constraint (269 200 t = EU quota of 224 100 t + Russian Federation quota of 45 100 t); tonnes

Table 2 Sprat in subdivisions 22–32. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2024)	F_{total} (2024)	SSB (2024)	SSB (2025)	% SSB change *	% TAC change **	% advice change ***
ICES advice basis							
EU MAP ^{^^} : F_{MSY}	241 604	0.34	808 959	941 534	16.4	–10.3	–3.1
EU MAP ^{^^} : range F_{lower}	191 075	0.26	831 149	1 010 476	22	–29	4.0 [^]
EU MAP ^{^^} : range F_{upper}	247 704	0.35	806 225	934 567	15.9	–8.0	–22 [^]
Other scenarios							
$F = 0$	0	0	908 746	1 262 057	39	–100	–100
$F = F_{\text{pa}}$	247 704	0.35	806 225	934 567	15.9	–8.0	–0.62
$F = F_{\text{lim}}$	374 838	0.58	751 215	789 146	5.0	39	50
SSB (2025) = B_{lim}	708 018	1.48	564 307	459 000	–18.6	163	184
SSB (2025) = B_{pa}	618 919	1.18	619 136	541 000	–12.8	130	148
SSB (2025) = $\text{MSY } B_{\text{trigger}}$	618 919	1.18	619 136	541 000	–12.8	130	148
SSB (2025) = SSB (2024)	439 772	0.715	720 349	720 454	0	63	76
$F = F_{2023}$	250 130	0.35	805 115	931 804	15.7	–7.1	0.36

* SSB_{2025} relative to SSB_{2024} .

** Catch in 2024 relative to the sum of autonomous quotas in 2023 (269 200 tonnes = EU quota of 224 100 tonnes + Russian Federation quota of 45 100 tonnes).

*** Advice value this year relative to the advice value last year (249 237 tonnes).

[^] Advice value this year relative to the advice value last year for the MAP range F_{lower} (183 749 tonnes) and MAP range F_{upper} (317 905 tonnes)

^{^^} MAP (EU, 2016, 2019, 2020).

The advised catches for 2024 are similar to those for 2023. Although the new F_{msy} reference point derived in the benchmark is higher, the catch advice decreased slightly mainly due to a large decline in the stock size.

Basis of the advice

Table 3 Sprat in subdivisions 22–32. 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 sprat (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, resulting in a change in the assessment model. Natural mortality estimates and reference points were also updated.

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 into the assessment and advice a level of uncertainty 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. These account for around 14% of the total catches, and the impact on the quality of the assessment cannot be quantified.

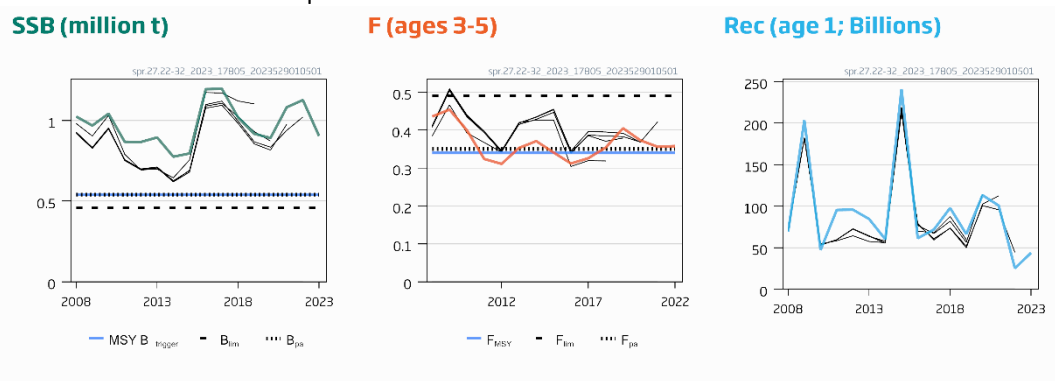


Figure 2 Sprat in subdivisions 22–32. Historical assessment results (final-year recruitment estimates up to 2022 were predicted from the survey; recruitment in 2023 is estimated within SAM model). The stock was benchmarked in 2023, and the fishing mortality and biomass reference points were updated. Only assessment results from the last year should be compared to the reference points indicated.

Issues relevant to the advice

The two most recent recruitment estimates are among the lowest in the time series. If such poor recruitment continues, the declining trend in SSB will continue.

Reference points

Table 4 Sprat in subdivisions 22–32. Reference points, values, and their technical basis. Weights in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	541 000	B_{pa}	ICES (2023a)
	F_{MSY}	0.34	Stochastic simulations with Beverton–Holt and segmented regression stock-recruitment model	ICES (2023a)
Precautionary approach	B_{lim}	459 000	Biomass that produces half of the maximal recruitment in the Beverton–Holt stock-recruitment relationship	ICES (2023a)
	B_{pa}	541 000	$B_{lim} \times \exp(1.645 \times \sigma)$, where $\sigma = 0.1$	ICES (2023a)
	F_{lim}	0.58	Consistent with B_{lim}	ICES (2023a)
	F_{pa}	0.35	F_{p05} ; the F that leads to $SSB \geq B_{lim}$ with 95% probability	ICES (2023a)
Management plan	MAP MSY $B_{trigger}$	541 000	MSY $B_{trigger}$	ICES (2023a)
	MAP B_{lim}	459 000	B_{lim}	ICES (2023a)
	MAP F_{MSY}	0.34	F_{MSY}	ICES (2023a)
	MAP target range F_{lower}	0.26–0.34	Consistent with the ranges that result in a $\leq 5\%$ reduction in long-term yield compared with MSY	ICES (2023a)
	MAP target range F_{upper}	0.34–0.35	Consistent with the ranges that result in a $\leq 5\%$ reduction in long-term yield compared with MSY, constrained by F_{p05}	ICES (2023a)

Basis of the assessment

Table 5 Sprat in subdivisions 22–32. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2023b)
Assessment type	Age-based analytical assessment, SAM (ICES, 2023c) that uses catches in the model and in the forecast
Input data	Commercial catches; two acoustic surveys (BASS [A7041], BIAS [A1588]); natural mortalities from multispecies model (SMS) until 2021, M in 2022 = M in 2021, fixed maturity ogive. Catches for Russian Federation since 2022 are taken from AtlantNIRO (2023a).
Discards and bycatch	Not included, considered negligible
Indicators	None
Other information	Benchmark in 2023 (ICES, 2023a). 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 Sprat in subdivisions 22–32. ICES advice, the agreed TAC, and ICES estimates of catch. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Agreed TAC	ICES catch
1987	Catch could be increased in subdivisions 22, 24, and 25. <i>Status quo</i> F for subdivisions 27 and 29–32.		117 200	93 400
1988	Catch could be increased in subdivisions 22–25	-	117 200	82 700
1989	Catch could be increased for subdivisions 26 and 28. <i>Status quo</i> F for subdivisions 27 and 29–32.	72 000	142 000	88 800
1990		72 000	150 000	94 900
1991	TAC	150 000	163 000	116 500
1992	<i>Status quo</i> F	143 000	290 000	145 700
1993	Increase in yield by increasing F	-	415 000	192 600
1994	Increase in yield by increasing F	-	700 000	297 600

Year	ICES advice	Catch corresponding to advice	Agreed TAC	ICES catch
1995	TAC	205 000	500 000	326 000
1996	Little gain in long-term yield at higher F	279 000	550 000	452 300
1997	No advice	-	550 000	543 200
1998	<i>Status quo</i> F	343 000	550 000	480 400
1999	Proposed F_{pa}	304 000	467 005	429 800
2000	Proposed F_{pa}	192 000	400 000	389 600
2001	Proposed F_{pa}	314 000	355 000	353 400
2002	Proposed F_{pa}	369 000	380 000	344 600
2003	Below proposed F_{pa} (TAC should be set on central Baltic herring considerations)	300 000	310 000	309 500
2004	Below proposed F_{pa} (TAC should be set on central Baltic herring considerations)	474 000	420 000	367 300
2005	TAC should be set on central Baltic herring considerations	< 614 000	550 000	404 500
2006	Agreed management plan	439 000	468 000	344 500
2007	< F_{pa}	< 477 000	454 000*	386 900
2008	< F_{pa}	< 432 000	454 000*	376 600
2009	< F_{pa}	< 291 000	399 000*	404 400
2010	< F_{pa}	< 306 000	380 000*	340 900
2011	< F_{pa}	< 242 000	322 700**	267 600
2012	MSY transition scheme	< 242 000	255 100**	243 000
2013	$F < F_{MSY}$	< 278 000	278 000**	273 100
2014	MSY approach	< 247 000	267 900**	242 100
2015	MSY approach	< 222 000	240 200**	247 300
2016	MSY approach ($F = 0.26$)	$\leq 205 000$	243 000**	247 200
2017	MSY approach ($F = 0.26$)	$\leq 314 000$	303 593**	288 500
2018	MAP target F ranges: F_{lower} to F_{upper} (0.19–0.27), but F higher than $F_{MSY} = 0.26$ only under conditions specified in MAP	219 152–301 722, but catch higher than 291 715 only under conditions specified in MAP	304 900**	312 188
2019	MAP target F ranges: F_{lower} to F_{upper} (0.19–0.27), but F higher than $F_{MSY} = 0.26$ only under conditions specified in MAP	225 752–311 523, but catch higher than 301 125 only under conditions specified in MAP	313 100**	317 650
2020	MAP target F ranges: F_{lower} to F_{upper} (0.19–0.27), but F higher than $F_{MSY} = 0.26$ only under conditions specified in MAP	169 965–233 704, but catch higher than 225 786 only under conditions specified in MAP	256 700**	274 060
2021	Management plan	247 952 (range 181 567–316 833)	268 458**	284 890
2022	Management plan	291 745 (range 214 000–373 210)	295 300**	301 409^
2023	Management plan	249 237 (range 183 749–317 905)	269 200**	

Year	ICES advice	Catch corresponding to advice	Agreed TAC	ICES catch
2024	Management plan	241 604 (range 191 075–247 704)		

* EU autonomous quota and does not include Russian Federation catches.

** TAC is calculated as EU + Russian Federation autonomous quotas.

^ Russia Federation landings were not officially reported to ICES, but an estimate is included.

History of the catch and landings

Table 7 Sprat in subdivisions 22–32. Catch distribution by fleet in 2022 as estimated by ICES.

Catch (2022)	Landings	Discards
301 409 tonnes	Most of the catch is taken by pelagic trawlers	Negligible
	301 409 tonnes	

Table 8 Sprat in subdivisions 22–32. History of ICES catches presented for each country participating in the fishery. All weights are in tonnes.

Year	Denmark	Estonia	Finland	German Dem. Rep.	German Fed. Rep.	Latvia	Lithuania	Poland	Russian Federation	Sweden	USSR	Total
1977	7 200		6 700	17 200	800			38 800		400	109 700	180 800
1978	10 800		6 100	13 700	800			24 700		800	75 500	132 400
1979	5 500		7 100	4 000	700			12 400		2 200	45 100	77 000
1980	4 700		6 200	100	500			12 700		2 800	31 400	58 400
1981	8 400		6 000	100	600			8 900		1 600	23 900	49 500
1982	6 700		4 500	1 000	600			14 200		2 800	18 900	48 700
1983	6 200		3 400	2 700	600			7 100		3 600	13 700	37 300
1984	3 200		2 400	2 800	700			9 300		8 400	25 900	52 700
1985	4 100		3 000	2 000	900			18 500		7 100	34 000	69 600
1986	6 000		3 200	2 500	500			23 700		3 500	36 500	75 900
1987	7 800		2 800	1 300	1 100			32 000		3 500	44 900	93 400
1988	4 500		3 000	1 200	300			22 200		7 300	44 200	82 700
1989	8 100		2 800	1 200	600			18 600		3 500	54 000	88 800
1990	10 100		2 700	500	800			13 300		7 500	60 000	94 900
1991	23 300		1 600		700			22 500		8 700	597 00*	116 500
1992	27 900	4 100	1 800		600	17 400	3 300	28 300	8 100	54 200		145 700
1993	32 900	5 800	1 700		600	12 600	3 300	31 800	11 200	92 700		192 600
1994	69 400	9 600	1 900		300	20 100	2 300	41 200	17 600	135 200		297 600
1995	77 500	13 100	5 200		200	24 400	2 900	44 200	14 800	143 700		326 000
1996	120 400	21 100	17 400		200	34 200	10 200	72 400	18 200	158 200		452 300
1997	151 200	38 900	24 400		400	49 300	4 800	99 900	22 400	151 900		543 200
1998	101 300	32 300	25 700		4 600	44 900	4 500	55 100	20 900	191 100		480 400
1999	97 300	33 200	18 900		200	42 800	2 300	66 300	31 500	137 300		429 800
2000	51 900	39 400	20 200		0	46 200	1 700	79 200	30 400	120 600		389 600
2001	50 700	37 500	15 400		800	42 800	3 000	85 800	32 000	85 400		353 400
2002	43 400	41 300	17 200		1 000	47 500	2 800	81 200	32 900	77 300		344 600
2003	33 200	29 200	9 000		18 000	41 700	2 200	84 100	28 700	63 400		309 500
2004	37 900	30 200	16 600		28 500	52 400	1 600	96 700	25 100	78 300		367 300
2005	45 600	49 800	17 900		29 000	64 700	8 600	71 400	29 700	87 800		404 500
2006	34 600	46 800	19 000		30 800	54 600	7 500	54 300	28 200	68 700		344 500
2007	35 500	51 000	24 600		30 800	60 500	20 300	58 700	24 800	80 700		386 900
2008	42 000	48 600	24 300		30 400	57 200	18 700	53 300	21 000	81 100		376 600

Year	Denmark	Estonia	Finland	German Dem. Rep.	German Fed. Rep.	Latvia	Lithuania	Poland	Russian Federation	Sweden	USSR	Total
2009	57 000	47 300	23 100		26 300	49 500	18 800	81 900	25 200	75 300		404 400
2010	43 000	47 900	24 400		17 800	45 900	9 200	56 700	25 600	70 400		340 900
2011	31 100	35 000	15 800		11 400	33 400	9 900	55 300	19 500	56 200		267 600
2012	19 400	27 700	9 000		11 300	30 700	11 300	62 100	25 000	46 500		243 000
2013	26 100	29 800	11 100		10 300	33 300	10 400	79 700	22 600	49 700		273 100
2014	25 000	28 500	11 700		10 200	30 800	9 600	56 900	23 400	46 000		242 100
2015	22 500	24 000	12 000		10 300	30 500	11 000	62 200	30 700	44 100		247 300
2016	19 700	23 700	16 900		10 900	28 100	11 600	59 300	34 600	42 400		247 200
2017	29 900	25 300	16 100		13 600	35 700	12 500	68 400	38 700	48 300		288 500
2018	27 951	29 341	16 430		15 213	37 099	16 250	79 395	41 374	49 135		312 188
2019	34 396	29 178	16 136		14 644	38 914	16 228	82 398	40 694	45 062		317 650
2020	28 980	24 270	12 498		8 929	28 893	11 164	72 539***	45 716	41 071		274 060
2021	24 753	25 582	14 773		11 959	29 091	11 369	79 198***	43 360	44 805		284 890
2022**	26 184	27 286	13 486		14 870	31 353	11 885	79 752***	42 793^	53 800		301 409

* Sum of landings by Estonia, Latvia, Lithuania, and Russian Federation.

** Preliminary.

*** Possible misreporting of sprat, as flounder from subdivisions 24 and 25 of about 1–3 kt are not included.

^ Landings of Russian Federation were not officially reported to ICES.

Summary of the assessment

Table 9 Sprat in subdivisions 22–32. Assessment summary. Weights in tonnes. Numbers in thousands.

Year	Recruitment (Age 1)			SSB*			Catches	F (Ages 3–5)		
		97.5%	2.5%		97.5%	2.5%			97.5%	2.5%
1974	76036000	111504000	51850000	1058866	1435981	780789	234100	0.31	0.43	0.22
1975	23172000	33712000	15927000	842638	1143557	620904	200700	0.30	0.42	0.22
1976	148600000	216318000	102082000	639077	868391	470318	165300	0.30	0.42	0.21
1977	76165000	110941000	52290000	924505	1269702	673158	180800	0.29	0.40	0.21
1978	21470000	31436000	14663000	695260	954717	506314	132400	0.25	0.35	0.177
1979	60686000	89022000	41369000	379087	524002	274248	77000	0.23	0.32	0.160
1980	19907000	29710000	13339000	281603	389356	203671	58400	0.24	0.34	0.172
1981	108320000	160291000	73200000	282460	388571	205326	49500	0.189	0.27	0.134
1982	19802000	29373000	13350000	346178	482561	248340	48700	0.195	0.27	0.139
1983	125861000	185773000	85271000	345553	474834	251470	37300	0.127	0.179	0.090
1984	62754000	91118000	43219000	558549	763396	408670	52700	0.149	0.20	0.109
1985	33762000	48571000	23468000	613036	815689	460731	69600	0.161	0.22	0.120
1986	24377000	35164000	16900000	548550	713809	421552	75900	0.180	0.24	0.136
1987	45367000	64759000	31781000	472561	605772	368643	93400	0.23	0.30	0.173
1988	4627000	6610000	3239000	466539	601893	361624	82700	0.23	0.31	0.179
1989	90499000	127988000	63991000	449517	568293	355567	88800	0.24	0.31	0.186
1990	58045000	80380000	41916000	747099	950853	587007	94900	0.196	0.25	0.155
1991	64498000	85806000	48481000	941255	1153602	767996	116500	0.180	0.22	0.147
1992	86918000	115293000	65526000	1005998	1211418	835410	145700	0.20	0.25	0.166
1993	87111000	119375000	63567000	1274757	1562033	1040313	192600	0.22	0.27	0.179
1994	36621000	48420000	27697000	1419210	1702582	1183002	297600	0.27	0.33	0.23
1995	182003000	249446000	132794000	1127016	1342152	946365	326000	0.35	0.43	0.29
1996	165178000	218306000	124979000	1622978	1964028	1341151	452300	0.40	0.47	0.33
1997	31626000	42722000	23413000	1731148	2093691	1431383	543200	0.43	0.52	0.36
1998	163343000	212784000	125390000	1169072	1373876	994799	480400	0.47	0.56	0.40
1999	27691000	35947000	21331000	1269998	1500098	1075192	429800	0.43	0.51	0.37

Year	Recruitment (Age 1)			SSB*			Catches	F (Ages 3–5)		
		97.5%	2.5%		97.5%	2.5%			97.5%	2.5%
2000	132494000	171457000	102385000	1036823	1208751	889350	389600	0.42	0.50	0.36
2001	41597000	53034000	32626000	1039610	1211978	891756	353400	0.42	0.50	0.36
2002	84985000	107938000	66912000	900779	1039709	780414	344600	0.42	0.49	0.36
2003	125933000	160265000	98956000	847891	978379	734807	309500	0.41	0.49	0.35
2004	259245000	331576000	202693000	957173	1116728	820415	367300	0.46	0.55	0.39
2005	32149000	40853000	25299000	1337981	1600615	1118441	404500	0.42	0.49	0.36
2006	116972000	149746000	91371000	1046256	1239363	883237	344500	0.37	0.44	0.31
2007	144407000	183135000	113869000	926017	1074704	797901	386900	0.44	0.52	0.38
2008	69170000	87748000	54525000	1025209	1197936	877388	376600	0.44	0.51	0.37
2009	203407000	259235000	159601000	968966	1125322	834334	404400	0.45	0.54	0.39
2010	47020000	59705000	37031000	1042774	1245259	873214	340900	0.40	0.48	0.34
2011	95396000	121838000	74693000	867977	1026511	733927	267600	0.32	0.39	0.27
2012	95726000	122753000	74650000	867086	1014746	740913	243000	0.31	0.37	0.26
2013	84482000	107383000	66465000	895339	1051788	762161	273100	0.35	0.42	0.30
2014	60061000	76349000	47248000	775753	911002	660584	242100	0.37	0.44	0.31
2015	241043000	310297000	187246000	795903	932644	679211	247300	0.34	0.41	0.28
2016	61370000	79711000	47248000	1194339	1455163	980265	247200	0.31	0.38	0.26
2017	71818000	91792000	56190000	1197166	1429400	1002663	288500	0.33	0.39	0.27
2018	97829000	125289000	76388000	1018449	1195422	867674	312188	0.35	0.42	0.30
2019	66306000	85762000	51263000	917639	1074990	783321	317650	0.41	0.48	0.34
2020	113258000	145060000	88428000	892322	1043141	763308	274060	0.37	0.45	0.31
2021	100704000	130926000	77458000	1082149	1285355	911068	284890	0.36	0.43	0.30
2022	25210000	34956000	18181000	1127237	1380565	920393	301409	0.36	0.45	0.29
2023	43773000**	88067000**	21757000**	903773***	1261572***	669735***				

* SSB at spawning time.

** Recruitment in 2023 is estimated in SAM from survey data.

*** Predicted at spawning time.

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