

## Hake (*Merluccius merluccius*) in subareas 4, 6, and 7, and in divisions 3.a, 8.a–b, and 8.d, Northern stock (Greater North Sea, Celtic Seas, and the northern Bay of Biscay)

### ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2024 should be no more than 72 839 tonnes.

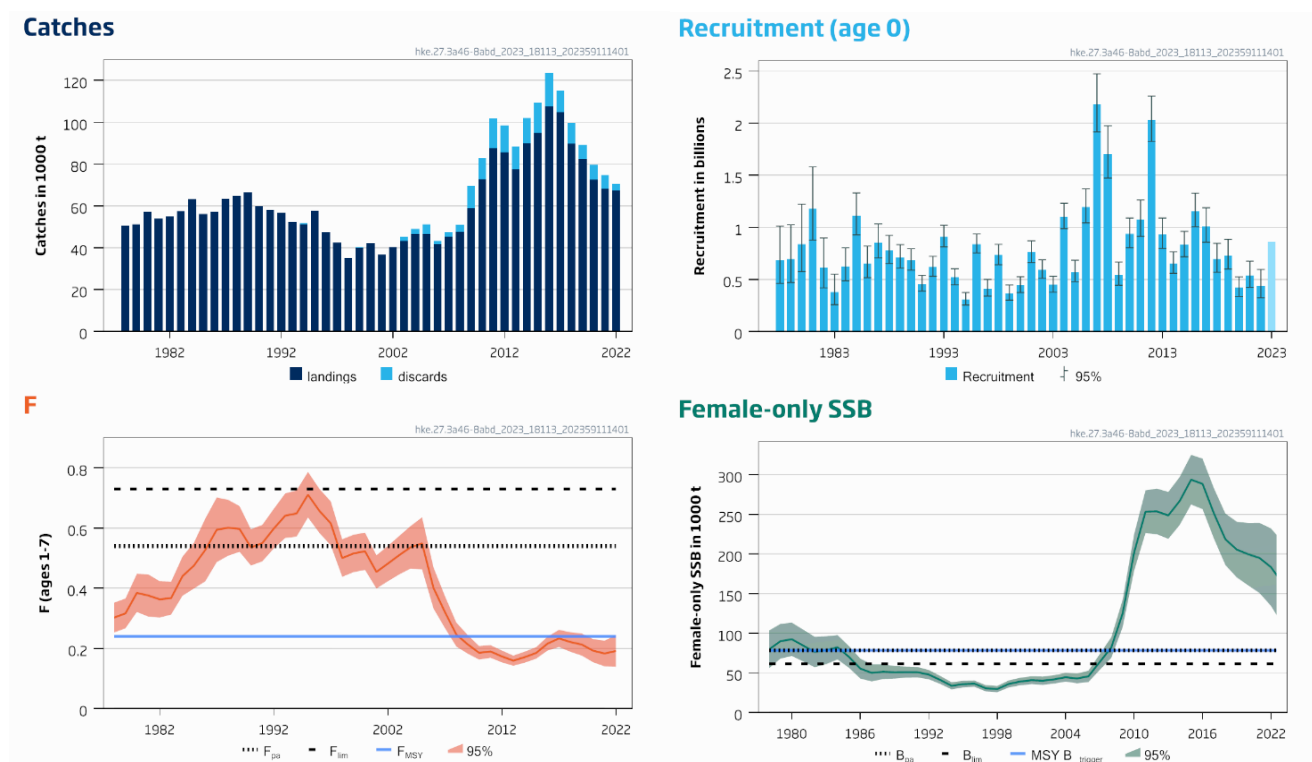
ICES notes the existence of a precautionary management plan developed and adopted by one of the relevant management authorities for this stock.

### 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 above MSY  $B_{trigger}$ ,  $B_{pa}$ , and  $B_{lim}$ .



**Figure 1** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Summary of the stock assessment. Discard estimates prior to 2003 are model estimates. The assumed recruitment value for 2023 is shaded in a lighter colour. Estimates for SSB are for females only.

### Conservation status

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

## Catch scenarios

**Table 1** Hake in subareas 4, 6, and 7, and in divisions 3.a, 8.a–b, and 8.d, Northern stock. The basis of the catch scenarios.

Variable	Value	Notes
$F_{\text{ages 1-7}}$ (2023)	0.189	$F_{sq}$ = average F (2020–2022).
SSB (2024)	147052	Short-term forecast (STF); females only, in tonnes.
$R_{\text{age 0}}$ (2023)	862134	Estimated by the model based on the stock–recruitment relationship; in thousands.
$R_{\text{age 0}}$ (2024)	855364	Estimated by the model based on the stock–recruitment relationship; in thousands.
Total catch (2023)	64096	STF; in tonnes.
Projected landings (2023)	60388	STF; assuming average landings ratio by length (2020–2022); in tonnes.
Projected discards (2023)	3707	STF; assuming average discards ratio by length (2020–2022); in tonnes.

**Table 2** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Annual catch scenarios. All weights are in tonnes. Note: the % change in TAC is not presented because the stock area does not correspond to the area for the TAC.

Basis	Total catch (2024)	Projected landings (2024)	Projected discards (2024)	$F_{\text{ages 1-7}}$ total (2024)	$F_{\text{ages 1-7}}$ projected landings (2024)	$F_{\text{ages 1-7}}$ projected discards (2024)	SSB (2025)	% SSB change*	% advice change**
ICES advice basis									
MSY approach = $F_{\text{MSY}}$	72839	67637	5202	0.24	0.23	0.0174	129326	-12.1	-12.4
Other scenarios									
EU MAP <sup>^</sup> : $F_{\text{MSY}}$	72839	67637	5202	0.24	0.23	0.0174	129326	-12.1	-12.4
$F = \text{MAP}^{\wedge}: F_{\text{MSY lower}}$	46722	43486	3236	0.147	0.137	0.0102	146172	-0.60	-44
$F = \text{MAP}^{\wedge}: F_{\text{MSY upper}}$	102890	95251	7640	0.37	0.34	0.027	110272	-25	24
$F = 0$	0	0	0	0	0	0	176869	20	-100
$F = F_{\text{pa}}$	135857	125263	10594	0.54	0.5	0.042	89853	-39	63
SSB (2025) = $B_{\text{lim}}$	183455	167811	15644	0.86	0.79	0.074	61563	-58	121
SSB (2025) = $B_{\text{pa}}$	154777	142318	12460	0.65	0.6	0.052	78405	-47	86
SSB (2025) = MSY $B_{\text{trigger}}$	154777	142318	12460	0.65	0.6	0.052	78405	-47	86
SSB (2025) = SSB(2024)	45368	42230	3138	0.142	0.132	0.0098	147052	0	-45
$F = F_{2023}$	58652	54534	4118	0.189	0.176	0.0133	138447	-5.9	-29

\* SSB 2025 relative to SSB 2024 (147 052 tonnes).

\*\* Total catch advice in 2024 relative to the catch advice for 2023 (83 130 tonnes).

<sup>^</sup>The EU multiannual plan (MAP; EU, 2019).

The advice is about 12% lower to last year's because the stock size is decreasing.

## Basis of the advice

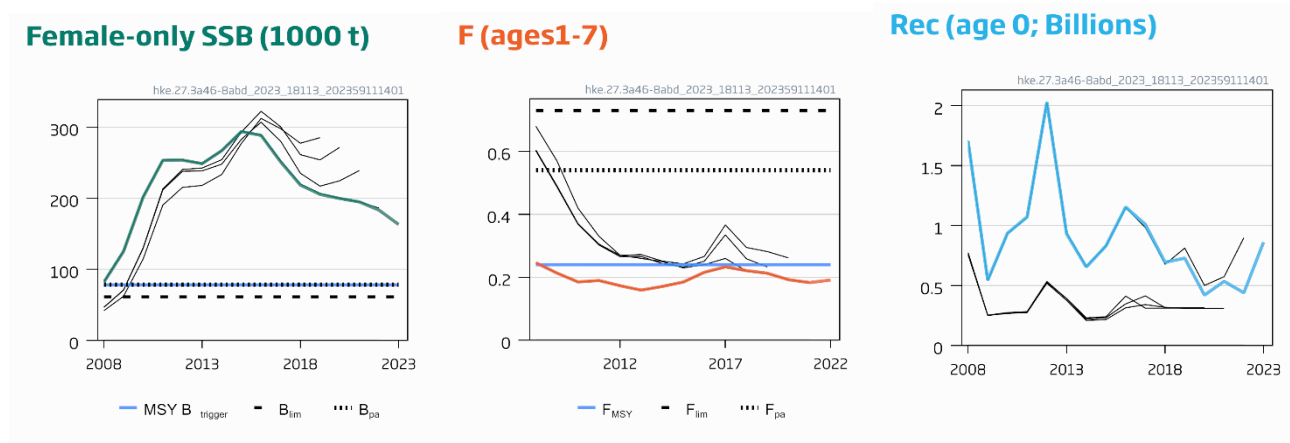
**Table 3** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. The basis for the advice.

Advice basis	MSY approach
Management plan	The EU multiannual plan (MAP) for stocks in the Western Waters and adjacent has been agreed by the EU for this stock (EU, 2019). This plan is not adopted by Norway and UK; thus, it was not used as the basis of the advice for this shared stock. ICES was requested to provide advice based on the MSY approach and to include the MAP as a catch option.

## Quality of the assessment

The stock was benchmarked in 2022, and this resulted in data revisions (ICES, 2023b).

There is no survey available that covers the entire stock distribution area. Changes in the spatial distribution of the stock may increase the uncertainties in the assessment.



**Figure 2** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Historical assessment results. The reference points and assessment results were revised following a benchmark in 2022, and only assessment results from the last 2 years should be compared to the reference points indicated. Final-year recruitment assumption included for each line.

### Issues relevant for the advice

The stock area does not correspond to the TAC areas for hake. Some catches come from outside of these TAC areas, but ICES is not able to quantify them.

### Reference points

**Table 4** Hake in subareas 4, 6, and 7, and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	78405	$B_{pa}$ ; females only, in tonnes.	ICES (2023b)
	$F_{MSY}$	0.24	Stock Synthesis simulations.	ICES (2023b)
Precautionary approach	$B_{lim}$	61563	The breakpoint of the segmented regression stock–recruitment relationship; females only, in tonnes.	ICES (2023b)
	$B_{pa}$	78405	$\exp(1.654 \times \sigma) \times B_{lim}$ , with $\sigma = 0.147$ ; females only, in tonnes.	ICES (2023b)
	$F_{lim}$	0.73	The F that provides a 50% probability for SSB to be above $B_{lim}$ .	ICES (2023b)
	$F_{pa}$	0.54	$F_{P05}$ with advice rule (AR): the F that provides a 95% probability for SSB to be above $B_{lim}$ .	ICES(2023b)
Management plan	$F_{mgt}$	Not defined		
	$SSB_{mgt}$	Not defined		
	MAP MSY $B_{trigger}$	78405	MSY $B_{trigger}$ ; females only, in tonnes.	ICES (2023b), EU (2019)
	MAP $B_{lim}$	61563	$B_{lim}$ ; females only, in tonnes.	ICES (2023b), EU (2019)
	MAP $F_{MSY}$	0.24	$F_{MSY}$	ICES (2023b), EU (2019)
	MAP range $F_{lower}$	0.147	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2023b), EU (2019)
	MAP range $F_{upper}$	0.37	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2023b), EU (2019)

## Basis of the assessment

**Table 5** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2023a).
Assessment type	Length-based and sex-disaggregated model (Stock Synthesis; ICES, 2023c) that uses landings and discards in the assessment and forecast.
Input data	Commercial catches; five survey indices including the French Southern Atlantic Bottom trawl survey (EVHOE-WIBTS-Q4 [G9527]), the Spanish Porcupine Bottom Trawl Survey (SpPGFS-WIBTS-Q3 [G5768]), the Irish Groundfish Survey (IGFS-WIBTS-Q4 [G7212]), the Irish Anglerfish and Megrin Survey (IE-IAMS [G3098]), and French surveys in the Bay of Biscay (FR-RESSGACQ [G2537]); constant maturity, and sex- and age-dependent natural mortality.
Discards and bycatch	Discard estimates from most fleets are available and included in the assessment.
Indicators	None.
Other information	Last benchmarked in 2022 (ICES, 2023b).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE).

## History of the advice, catch, and management

**Table 6** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. ICES advice and catch. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC*	ICES landings	ICES discards	ICES catch
1987	Precautionary TAC; juvenile protection			63500	63369		
1988	Precautionary TAC; juvenile protection		54000	66200	64823	**	
1989	Precautionary TAC; juvenile protection		54000	59700	66473	**	
1990	Precautionary TAC; juvenile protection		59000	65100	59954		
1991	Precautionary TAC; juvenile protection		59000	67000	58129		
1992	If required, precautionary TAC		61500	69000	56617		
1993	Enforce juvenile protection legislation		-	71500	52144		
1994	F significantly reduced		-	60000	51259	**	
1995	30% reduction in F		31000	55100	57621		
1996	30% reduction in F		39000	51100	47210		
1997	20% reduction in F		54000	60100	42465		
1998	20% reduction in F		45000	59100	35060		
1999	Reduce F below $F_{pa}$		-	55100	39814	**	
2000	50% reduction in F		-	42100	42026	**	
2001	Lowest possible catch, recovery plan		-	22600	36675		
2002	Lowest possible catch/recovery plan		-	27000	40105		
2003	Lowest possible catch/recovery plan		-	30000	43162	1393	44555
2004	70% reduction in F or recovery plan		-	39100	46416	2614	49029
2005	$F = 0.19$		33000	42600	46550	4583	51133
2006	$F = 0.25$		44000	43900	41469	1222	42691
2007	Recovery plan limits		50500	52700	45093	2165	47258
2008	Recovery plan limits		54000	54000	47822	3368	51190
2009	$F = 0.25 = F_{pa}$		51500	51500	58781	11033	69814
2010	$F = 0.25 = F_{pa}$		55200	55105	72760	12118	84878
2011	See scenarios		50600	55105	87540	13903	101443

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC*	ICES landings	ICES discards	ICES catch
2012	MSY transition		51900	55105	85677	14870	100547
2013	MSY transition		45400	69440	86148	15450	101598
2014	MSY approach		81846	81846	89940	9832	99772
2015	MSY approach		78457	90849	95041	10921	105962
2016	MSY approach	≤109592	≤96651	108764	107546	11115	118662
2017	MSY approach	≤123777		119765	104671	7100	111771
2018	MSY approach	≤115335		111785	89695	7038	96733
2019	MSY approach	≤142240		141160	82291	4940	87238
2020	MSY approach	≤104763		112903	72579	3955	76534
2021	MSY approach (value revised in June 2021)	≤102888		98658	68058	3085	71142
2022	MSY approach	≤75052		78926	67432	1951	69382
2023	MSY approach	≤83130		83130			
2024	MSY approach	≤72839					

\* Sum of area TACs, corresponding to Northern stock (subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d), Division 2.a (EU zone; from 2021 onwards, only the UK is considered) and divisions 3.b–d (except for 2019 onwards). There is no agreed TAC for Norwegian waters of Subarea 4.

\*\* Partial discard estimates are available and used in the assessment. For the remaining years where values are not presented, there are no valid discard estimates available for the assessment.

### History of the catch and landings

**Table 7** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Catch distribution by fleet in 2022 as estimated by ICES. All weights are in tonnes.

Catch	Landings				Discards
	9.5% unspecified gear	29% longline	32% gillnet	30% trawl	
69382	67432				1951

**Table 8** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. History of commercial catch and landings; ICES estimated values (i.e. landings by area and total landings minus unallocated) are presented by area for each country participating in the fishery. All weights are in tonnes.

Year	ICES estimated landings*							ICES estimated discards						Total catches**	
	Subarea 3	Subarea 4	Subarea 6	Subarea 7	Divisions 8.a–b & 8.d	Unallocated	Total	Subarea 3	Subarea 4	Subarea 6	Subarea 7	Divisions 8.a,b,d	Total		
1961			-	-	-	95600	95600							-	95600
1962			-	-	-	86300	86300							-	86300
1963			-	-	-	86200	86200							-	86200
1964			-	-	-	76800	76800							-	76800
1965			-	-	-	64700	64700							-	64700
1966			-	-	-	60900	60900							-	60900
1967			-	-	-	62100	62100							-	62100
1968			-	-	-	62000	62000							-	62000
1969			-	-	-	54900	54900							-	54900
1970			-	-	-	64900	64900							-	64900
1971			8500	19400	23400	0	51300							-	51300
1972			9400	14900	41200	0	65500							-	65500
1973			9500	31200	37600	0	78300							-	78300
1974			9700	28900	34500	0	73100							-	73100
1975			11000	29200	32500	0	72700							-	72700
1976			12900	26700	28500	0	68100							-	68100
1977			8500	21000	24700	0	54200							-	54200
1978			8000	20300	24500	-2249	50551							-	50551
1979			8700	17600	27200	-2404	51096							-	51096
1980			9700	22000	28400	-2835	57265							-	57265
1981			8800	25600	22300	-2782	53918							-	53918
1982			5900	25200	26200	-2306	54994							-	54994
1983			6200	26300	27100	-2093	57507							-	57507
1984			9500	33000	22900	-2114	63286							-	63286
1985			9224	27459	21044	-1628	56099							-	56099
1986			7320	27408	23903	-1539	57092							-	57092
1987			7800	32900	24700	-2031	63369							-	63369
1988			8800	30900	26600	-1477	64823							-	64823
1989			7375	26938	31957	203	66473							-	66473
1990			6680	23011	34424	-4161	59954							-	59954
1991			8328	21546	31635	-3380	58129							-	58129
1992			8561	22475	23465	2116	56617							-	56617
1993			8484	20465	19849	3346	52144							-	52144

Year	ICES estimated landings*							ICES estimated discards						Total catches **	
	Subarea 3	Subarea 4	Subarea 6	Subarea 7	Divisions 8.a-b & 8.d	Unallocated	Total	Subarea 3	Subarea 4	Subarea 6	Subarea 7	Divisions 8.a,b,d	Total		
1994			5421	21080	24727	31	51259							+	51259
1995			5335	24056	28144	86	57621							-	57621
1996			4445	24738	18036	-9	47210							-	47210
1997			3312	18949	20339	-135	42465							-	42465
1998			3208	18705	13147	0	35060							-	35060
1999			4256	23955	11604	-1	39814							+	39814
2000			4033	25991	11998	4	42026							+	42026
2001			4367	23065	9244	0	36675							-	36675
2002			2944	21226	15935	0	40105							-	40105
2003			3284	25438	14440	0	43162						1393		44555
2004			4438	27483	14494	0	46416						2614		49029
2005			5461	26623	14467	0	46550						4583		51133
2006			6127	24709	10633	0	41469						1222		42691
2007			7017	27456	10620	0	45093						2165		47258
2008			10654	22834	14334	0	47822						3368		51190
2009			13057	25300	20424	0	58781						11033		69814
2010			14187	33500	25073	0	72760						12118		84878
2011			18789	18574	16604	32000^	87540						13903		101443
2012			22415	22166	16716	19300^	85677						14870		100547
2013	292	10684	5232	50054	19885	0	86148	314	2945	1545	6584	4061	15450		101598
2014	350	12082	11415	40538	25554	0 ^	89940	288	3104	952	4026	1462	9832		99772
2015	450	14615	7079^^	44400	28498	0 ^	95041	93	3444	72	4212	3100	10921		105962
2016	698	19591	11379^^	49388	26490	0	107546	144	4187	348^^	2285	4151	11115		118662
2017	775	19690	9615^^	45737	28854	0	104671	149	1777	314	1168	3692	7100		111771
2018	698	18915	7281^^	36906	25894	0	89695	287	1256	266	2124	3105	7038		96733
2019	1522	15569	6835^^	36873	21492	8	82291	235	926	297	1423	2059	4940		87238
2020	605	13080	4113^^	35100	19674	7	72579	280	336	296	1063	1979	3955		76534
2021	791	9300	3823^^	33393	20750	0	68058	110	340	619	926	1090	3085		71142
2022	1086	11087	3850^^	27668	23741	0	67431	81	160	135	329	1246	1951		69382

\* Data for Subarea 8 for 1973–1978 include those for divisions 8.a and 8.b only. Divisions 3.a and 4.b–c are included in columns 3, 4, and 6 only after 1976. There are some unallocated landings.

\*\* The working group used total catches from 1978.

^ Unallocated landings for the years 2011–2014 were revised in 2015.

^^ Landings and discards data from Subarea 5 are included.

**Table 9** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. History of commercial catches by country as estimated by ICES. All weights are in tonnes.

Year	Belgium	Denmark	France	Germany	Ireland	Netherlands	Norway	Spain	Sweden	UK (England)	UK (Northern Ireland)	UK (Scotland)
2014	218	3407	41290	835	4919	221	3031	30747	106	2310	29	12659
2015	144	4242	46034	786	3873	693	4181	33471	103	3148	134	9154
2016	155	4617	49103	845	4168	883	5781	34503	94	2722	116	15675
2017	451	5125	47557	737	3477	188	3974	33317	90	2329	222	14303
2018	212	4529	41804	1212	4440	519	3960	26078	119	2689	130	11039
2019	362	3427	35341	760	4700	503	4144	25538	148	2763	127	9425
2020	190	4225	31635	409	4399	318	2968	23540	94	1879	96	6737
2021	141	3598	29208	696	4721	305	1995	23171	100	1779	155	5273
2022	181	3762	29664	394	3542	380	2011	20859	140	1974	174	6301

### Summary of the assessment

**Table 10** Hake in subareas 4, 6, and 7 and in divisions 3.a, 8.a–b, and 8.d, Northern stock. Assessment summary. ‘High’ and ‘Low’ refer to 95% confidence intervals. The SSB is for females only.

Year	Recruitment age 0			Stock size				Landings	Discards **	Fishing pressure (ages 1–7)		
	Low	R	High	Low	SSB	High	TSB <sup>^</sup>			Low	F	High
	Thousands			tonnes				tonnes				
1978	461537	683384	1011867	55856	79678	103501	165738	50551	923	0.25	0.3	0.35
1979	470222	694062	1024457	68028	90001	111973	171170	51096	918	0.27	0.32	0.37
1980	574998	838409	1222491	71321	92412	113503	166483	57265	1130	0.32	0.38	0.45
1981	878216	1178220	1580707	64272	84415	104558	152523	53918	1197	0.31	0.38	0.45
1982	418659	613194	898122	57113	76401	95689	154552	54994	1436	0.30	0.36	0.42
1983	257622	376535	550337	60933	78605	96276	162446	57507	1007	0.31	0.37	0.42
1984	487080	625493	803238	66920	82363	97806	155039	63286	785	0.38	0.44	0.51
1985	926770	1110400	1330415	56458	70232	84006	128744	56099	1499	0.40	0.48	0.55
1986	516263	650651	820022	42861	55495	68129	119970	57092	1746	0.42	0.53	0.63
1987	706618	854130	1032436	39157	50024	60890	124285	63369	1417	0.49	0.59	0.70
1988	651567	775284	922493	42272	51496	60719	127134	64823	1704	0.51	0.60	0.69
1989	608519	712232	833621	42826	50794	58762	129229	66473	1637	0.52	0.60	0.67
1990	588296	683428	793943	44027	51031	58035	123210	59954	1373	0.48	0.54	0.60
1991	387220	456869	539045	44312	50914	57516	118656	58129	1114	0.49	0.55	0.61
1992	529918	618270	721352	41916	47844	53773	108215	56617	959	0.53	0.60	0.66
1993	812335	910533	1020601	36052	41172	46292	93303	52144	1219	0.57	0.64	0.72
1994	447502	519549	603195	29148	33741	38335	93170	51259	1262	0.57	0.65	0.73



Year	Recruitment age 0			Stock size				Landings	Discards **	Fishing pressure (ages 1–7)		
	Low	R	High	Low	SSB	High	TSB <sup>^</sup>			Low	F	High
	Thousands			tonnes				tonnes				
1995	253595	308226	374626	31634	35832	40030	97494	57621	1103	0.64	0.71	0.79
1996	754438	840607	936618	32442	36444	40445	84850	47210	687	0.58	0.66	0.73
1997	339539	412236	500497	26591	30619	34647	78932	42465	1114	0.54	0.62	0.69
1998	641487	732870	837271	25606	29600	33595	80941	35060	1583	0.44	0.5	0.56
1999	301529	366861	446348	31497	36011	40524	90687	39814	2697	0.45	0.52	0.58
2000	373748	443510	526293	34290	39077	43864	95478	42026	2105	0.46	0.52	0.59
2001	661184	758858	870961	35780	40777	45773	91748	36675	2105	0.40	0.45	0.51
2002	510258	592672	688396	34900	40143	45386	97105	40107	3714	0.42	0.48	0.54
2003	376350	446780	530391	36571	41882	47193	102157	43162	3751	0.45	0.51	0.57
2004	987931	1103400	1232365	38978	44512	50045	103335	46417	3165	0.47	0.54	0.61
2005	478468	572275	684474	36865	42954	49044	107635	46550	4161	0.46	0.55	0.64
2006	1042620	1194990	1369628	38432	45709	52985	125772	41467	2628	0.33	0.4	0.47
2007	1916402	2177390	2473921	53921	63972	74023	155753	45028	2964	0.27	0.32	0.37
2008	1473412	1705790	1974818	68885	82017	95150	215564	47739	4442	0.21	0.25	0.29
2009	444338	544279	666698	107771	125263	142755	331546	58818	7727	0.182	0.21	0.24
2010	804189	936255	1090010	178601	201808	225015	422679	72799	8870	0.163	0.185	0.21
2011	913212	1073530	1261992	226339	253369	280399	457676	87540	11097	0.169	0.19	0.21
2012	1824434	2030650	2260174	224911	253728	282545	453682	85677	9534	0.153	0.173	0.193
2013	797062	931884	1089511	219084	248746	278408	470317	77343	9613	0.142	0.159	0.176
2014	558757	654020	765525	236694	267045	297396	510863	89940	10952	0.153	0.171	0.189
2015	718168	830926	961387	262456	293823	325190	517217	95043	11622	0.166	0.185	0.20
2016	1005240	1155580	1328404	256561	288515	320469	482595	107547	12065	0.193	0.22	0.24
2017	857889	1009600	1188139	219225	251115	283005	430998	104670	10639	0.20	0.23	0.26
2018	569175	693924	846015	186085	218651	251217	393243	89695	9764	0.189	0.22	0.25
2019	599359	728183	884696	170433	205621	240809	374384	82298	8108	0.176	0.21	0.25
2020	336337	419888	524194	160391	199765	239139	358379	72579	6043	0.154	0.192	0.23
2021	423537	534789	675264	150651	194941	239231	337996	68061	4686	0.140	0.183	0.23
2022	323769	439104	595525	134437	183432	232427	310282	67433	4179	0.139	0.191	0.24
2023		862134*		110777	163204	215631	280323					

\* Recruitment estimated by the model for the short-term forecast.

\*\* Model estimates.

<sup>^</sup> Total stock size, both sexes, including immature fish.

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