

4.3.3 Haddock (*Melanogrammus aeglefinus*) in Division Vb (Faroes grounds)

ICES stock advice

ICES advises that when the precautionary approach is applied, there should be no directed fishery on haddock in 2016 and bycatch should be minimized. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery.

Stock development over time

The spawning-stock biomass (SSB) has decreased since 2003 and is estimated to have been below B_{lim} since 2010. The fishing mortality (F) has decreased in recent years and is now slightly above F_{MSY} . Recruitment from 2003 onwards has been well below the long-term average.

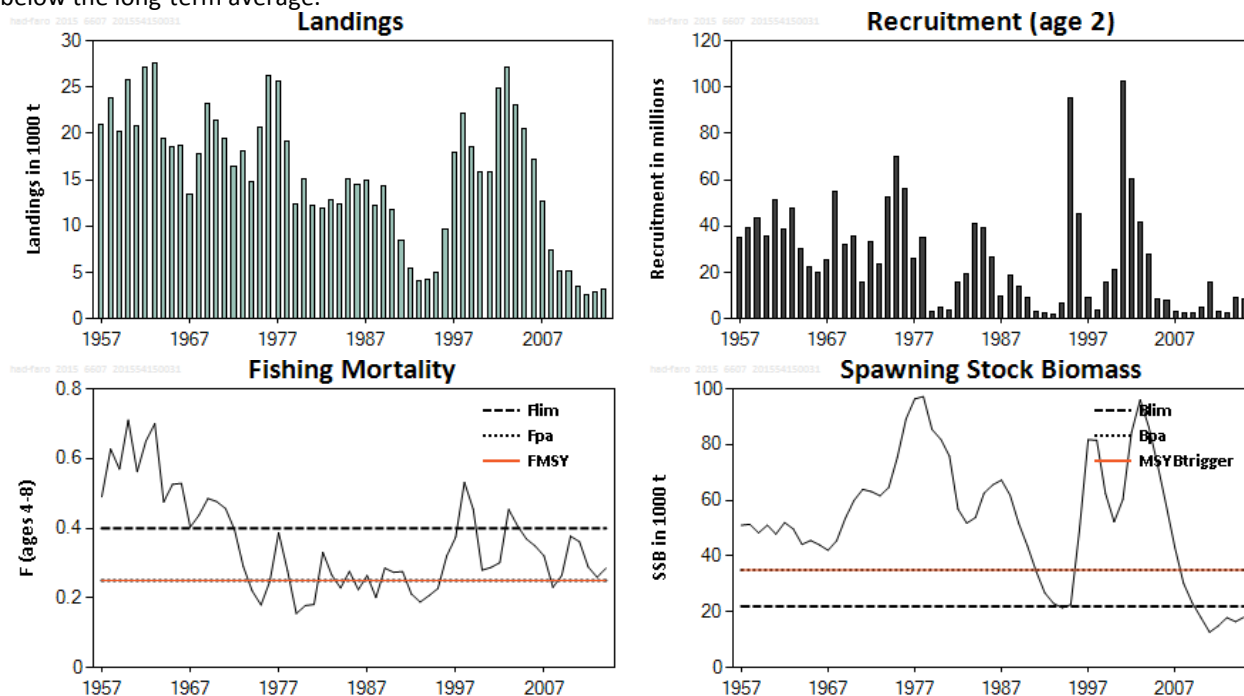


Figure 4.3.3.1 Haddock in Division Vb. Summary of stock assessment (weights in thousand tonnes).

Stock and exploitation status

Table 4.3.3.1 Haddock in Division Vb. 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}	✘	✘	✘ Above F_{MSY}	$B_{trigger}$	✘	✘ Below $B_{trigger}$
Precautionary approach	F_{pa} , F_{lim}	○	○	○ Increased risk	B_{pa} , B_{lim}	✘	✘ Below B_{lim}
Management Plan	F_{MGT}	-	-	- Not applicable	SSB_{MGT}	-	- Not applicable

Catch options

Table 4.3.3.2 Haddock in Division Vb. The basis for the catch options.

Variable	Value	Source	Notes
F ages 4–8 (2015)	0.28	ICES (2015a)	Unscaled averages for 2012–2014.
SSB (2016)	18 912 t	ICES (2015a)	
R _{age2} (2016)	5.078 mill.	ICES (2015a)	Derived from the 2015 assessment.
R _{age2} (2017)	5.089 mill.	ICES (2015a)	Geometric mean since 2005.
Total catch (2015)	3 820 t	ICES (2015a)	

Table 4.3.3.3 Haddock in Division Vb. The catch options.

Rationale	F (2016)	Landings (2016)	Basis	SSB (2017)	%SSB change *
MSY approach	0.14	2.5	$F_{MSY} \times SSB_{2016} / B_{trigger}$	19.7	4
MSY and F_{pa}	0.25	4.2	$F_{sq} \times 0.93$	17.9	-5
Zero catch	0.00	0.0	$F = 0$	22.2	17
<i>Status quo</i>	0.14	2.5	$F_{sq} \times 0.50$	19.7	4
	0.28	4.6	F_{sq}	17.5	-7
	0.34	5.4	$F_{sq} \times 1.20$	16.5	-13

Weights in thousand tonnes.

* SSB 2017 relative to SSB 2016.

Based on the MSY approach, F in 2016 should be no more than 0.14 ($F_{MSY} \times B_{2016} / MSY B_{trigger}$). However, because the current biomass is estimated to be below B_{lim} , ICES recommends no directed fishing on haddock in 2016 and recommends that measures are put in place that will minimize bycatches of haddock in other fisheries. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery.

Basis of the advice

Table 4.3.3.4 Haddock in Division Vb. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	There is no management plan for this stock.

Quality of the assessment

The landings data are considered accurate. There are no incentives to discard fish under the effort management system. The sampling of the landings is believed to be adequate. No major problems have been observed with the tuning indices (the two surveys).

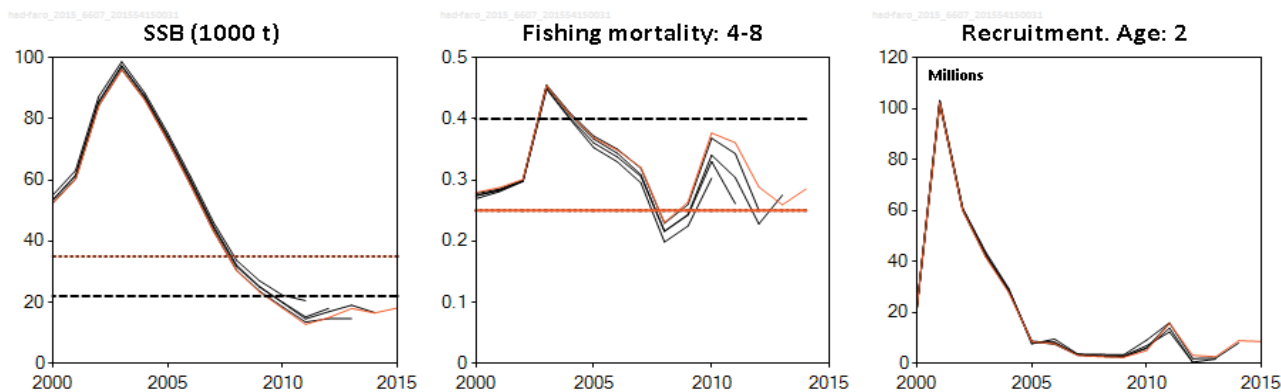


Figure 4.3.3.2 Haddock in Division Vb. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

There is no management plan for this stock. A preliminary management plan, including a recovery plan, was formulated in 2011, but has not been implemented. An effort management system has been used since 1996. The Faroese Parliament decides the number of allocated fishing days for each new fishing season. The number of used fishing days is, for some of the Faroese fleets, only around half of the allocated days.

Reference points

Table 4.3.3.5 Haddock in Division Vb. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	35 000 t	B_{pa}	ICES (2011)
	F_{MSY}	0.25	Stochastic simulations.	ICES (2011)
Precautionary approach	B_{lim}	22 000 t	Lowest observed SSB.	ICES (1998)
	B_{pa}	35 000 t	$B_{lim} e^{1.645\sigma}$, with σ of 0.3.	ICES (1998)
	F_{lim}	0.40	$F_{pa} e^{1.645\sigma}$, with σ of 0.3.	ICES (1998)
	F_{pa}	0.25	$F_{med}(1998) = 0.25$.	ICES (1998)
Management plan	SSB_{MGT}	Not defined		
	F_{MGT}	Not defined		

Basis of the assessment

Table 4.3.3.6 Haddock in Division Vb. The basis of the assessment.

ICES stock data category	1 (ICES, 2015b).
Assessment type	XSA with catch-at-age data and age-disaggregated indices, using catches in the model and in the forecast.
Input data	Commercial catches (mainly Faroese catches, ages and length frequencies from catch sampling); survey indices (FO-GFS-Q1&3); annual maturity data from FO-GFS-Q1; natural mortalities set at 0.2.
Discards and bycatch	Discards are not included and are assumed negligible.
Indicators	None.
Other information	None.
Working group report	North-Western Working Group (NWWG ; ICES, 2015b).

Information from stakeholders

There is no available information.

History of advice, catch, and management

Table 4.3.3.7 Haddock in Division Vb (Faroes grounds). History of ICES advice, the agreed TAC, and ICES estimates of landings.

Fishing year*	ICES advice	Predicted catch corresp. to advice	Agreed TAC	ICES catch
1987	No increase in F	17		14.9
1988	No increase in F	18		12.2
1989	No increase in F	11		14.3
1990	No increase in F	11		11.7
1991	TAC	11		8.4
1992	TAC	13–15		5.5
1993	Reduction in F	8		4.0
1994	No fishing	0	6.2	4.3
1995	No fishing	0	6.2	4.9
1996	TAC	8.3	12.6	9.6
1997	F = F(95)	9.3		17.9
1998	F = F(96)	16		22.2
1999	F < proposed F_{pa} (0.25)	9		18.5
2000	F < proposed F_{pa} (0.25)	22		15.8
2001	F < proposed F_{pa} (0.25)	20		15.9
2002	No fishing	0		24.9
2003	F < proposed F_{pa} (0.25)	12		26.9
2004	F < proposed F_{pa} (0.25)	21		23.1
2005	F < proposed F_{pa} (0.25)	19		20.3
2006	F < proposed F_{pa} (0.25)	18		17.2
2007	F < 0.20	16		12.6
2008	F_{pa}	14		7.3
2009	No fishing and recovery plan	0		5.2
2010	No fishing and recovery plan	0		5.2
2011	No direct fishing; minimize bycatch, implement recovery plan	0		3.5
2012	No direct fishing; minimize bycatch, implement recovery plan	0		2.6
2013	No direct fishing; minimize bycatch, implement recovery plan	0		3.0
2014	No direct fishing; minimize bycatch, implement recovery plan	0		3.2
2015	No direct fishing; minimize bycatch, implement recovery plan	0		
2016	No direct fishing; minimize bycatch, implement recovery plan	0		

Weights in thousand tonnes.

* The fishing year runs from 1 September to 31 August the following year.

History of catch and landings

Table 4.3.3.8 Haddock in Division Vb. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings		Commercial discards
	82% longliners	18% trawlers	
3.2 kt	3.2 kt		0 kt

Table 4.3.3.9 Haddock in Division Vb. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery.

Year	Belgium	Denmark	England	Faroe Islands	France	Germany	Island	Netherland	Nnonway	Portugal	Scotland	Spain	Total	Others
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	8	0	0	0	0	8	8
1904	0	0	0	0	0	0	0	6	0	0	1046	0	1052	6
1905	23	0	0	0	0	0	0	66	0	0	851	0	940	89
1906	23	0	9713	0	0	0	0	155	0	0	1118	0	11009	178
1907	11	0	8653	0	0	0	0	279	0	0	1192	0	10135	290
1908	0	0	5494	0	0	0	0	190	0	0	767	0	6451	190
1909	14	0	7397	0	0	0	0	242	0	0	559	0	8212	256
1910	0	0	6697	0	0	0	0	40	0	0	635	0	7372	40
1911	24	0	5990	0	0	0	0	18	0	0	529	0	6561	42
1912	0	0	7500	0	0	0	0	0	0	0	1334	0	8834	0
1913	0	0	7935	0	0	0	0	36	0	0	1675	0	9646	36
1914	0	0	5301	0	0	0	0	2	0	0	2282	0	7585	2
1915	0	0	2359	0	0	0	0	0	0	0	1796	0	4155	0
1916	0	0	0	0	0	0	0	0	0	0	1447	0	1447	0
1917	0	0	0	0	0	0	0	0	0	0	557	0	557	0
1918	0	0	0	0	0	0	0	0	0	0	217	0	217	0
1919	0	0	6040	0	0	0	0	0	0	0	3519	0	9559	0
1920	0	0	2657	0	0	0	0	0	0	0	1010	0	3667	0
1921	0	0	1812	0	0	0	0	0	0	0	380	0	2192	0
1922	0	0	3808	0	0	0	0	6	0	0	1900	0	5714	6
1923	0	0	5688	0	0	37	0	0	0	0	1982	0	7707	37
1924	0	0	7639	0	0	0	0	0	0	0	1547	0	9186	0
1925	0	0	6289	0	0	0	0	0	0	0	1251	0	7540	0
1926	0	0	6567	0	0	0	0	17	0	0	2057	0	8641	17
1927	0	0	7515	0	0	0	0	0	0	0	2025	0	9540	0
1928	1	0	8240	0	4	8	0	17	0	0	1438	0	9708	26
1929	0	0	6662	0	0	3	0	0	0	0	905	0	7570	3
1930	0	3	7294	0	0	0	0	1	0	0	1718	0	9016	4
1931	0	2	9188	3	0	0	0	0	0	0	2382	0	11575	2
1932	0	0	12065	10	0	0	0	86	0	0	2437	0	14598	86
1933	0	15	8595	1	0	0	0	0	0	0	2050	0	10661	15
1934	3	0	8591	2	0	0	0	0	0	0	1938	0	10534	3
1935	0	0	9796	1	0	0	0	0	0	0	2745	0	12542	0
1936	0	0	10422	21	0	0	5	0	0	0	3574	0	14022	5
1937	0	2	9539	81	0	0	0	0	0	0	3495	0	13117	2
1938	0	1	10885	145	0	0	0	0	0	0	3708	0	14739	1
1939	0	0	0	145	0	0	0	0	0	0	1907	0	1952	0
1940	0	0	0	0	0	0	0	0	0	0	3799	0	3799	0
1941	0	0	0	0	0	0	0	0	0	0	2353	0	2353	0
1942	0	0	0	0	0	0	0	0	0	0	3267	0	3267	0
1943	0	0	0	0	0	0	0	0	0	0	5099	0	5099	0
1944	0	0	0	0	0	0	0	0	0	0	3770	0	3770	0
1945	0	0	0	0	0	0	0	0	0	0	2546	0	2546	0
1946	0	0	8533	0	0	0	0	0	0	0	5277	0	13810	0
1947	0	0	6009	0	0	0	0	0	0	0	6522	0	12531	0
1948	0	0	3568	0	0	0	0	0	0	0	6511	0	10079	0
1949	0	0	3126	0	0	0	0	0	0	0	6679	0	9805	0
1950	0	0	3935	0	0	0	0	0	0	0	8048	0	11983	0
1951	0	0	6465	0	0	0	0	0	0	0	7944	0	14409	0
1952	0	0	7535	83	0	0	0	0	0	0	6653	0	14271	0
1953	0	0	5820	2788	0	0	0	0	0	0	6404	0	15012	0
1954	0	0	5925	2654	0	1	0	0	0	0	6832	0	15412	1
1955	0	0	5008	3865	0	33	0	0	0	0	7667	0	16573	33
1956	0	0	5762	4221	0	20	0	0	0	0	7512	0	17515	20
1957	0	0	6902	4453	0	38	0	0	0	0	9602	0	20995	38
1958	0	0	7429	6850	0	19	0	0	0	0	9573	0	23871	19
1959	0	0	5339	5670	0	10	0	0	0	0	9220	0	20239	10
1960	0	0	7006	7772	0	6	0	0	0	0	10943	0	25727	6

1961	0	0	2643	8454	0	22	0	0	0	0	9590	0	20709	22
1962	0	0	3766	7042	166	18	0	0	0	0	16159	0	27151	18
1963	0	0	4655	6336	792	20	0	0	0	0	15766	0	27569	20
1964	0	0	3442	6952	1866	33	0	0	111	0	7087	0	19491	33
1965	0	0	3385	6673	1939	15	0	0	40	0	6355	0	18407	15
1966	0	0	2867	6902	2717	36	0	0	0	0	6240	0	18762	36
1967	0	8	2347	5246	1091	24	0	0	0	0	4656	0	13372	32
1968	0	0	2445	6751	2286	36	0	0	0	0	6339	0	17857	36
1969	0	0	1976	11122	3387	0	0	0	0	0	6815	0	23300	0
1970	0	0	1137	11791	2006	14	0	0	0	0	6421	0	21369	14
1971	0	0	2323	10488	790	19	0	29	0	0	5762	0	19411	48
1972	0	0	3369	8314	2666	25	0	0	844	0	1267	0	16496	25
1973	0	0	2426	6018	3508	46	0	0	0	1190	4788	0	17976	1236
1974	0	0	1617	4811	1451	70	0	0	5	685	6072	52	14773	807
1975	0	0	2426	8757	2298	173	0	383	56	544	6078	0	20715	1100
1976	6	0	2284	12714	2542	22	0	175	20	448	8000	0	26211	651
1977	0	0	709	20079	700	49	0	26	57	5	3928	0	25555	80
1978	0	0	48	18182	71	8	0	0	130	0	761	0	19200	8
1979	0	0	35	11975	50	2	0	0	45	0	317	0	12418	2
1980	0	6	158	14323	31	4	0	0	17	0	477	0	15016	10
1981	0	0	0	11994	113	0	0	0	27	0	99	0	12233	0
1982	0	0	0	11852	2	1	0	0	13	0	48	0	11917	1
1983	0	0	0	12865	2	0	0	0	14	0	13	0	12894	0
1984	0	0	0	12343	20	0	0	0	15	0	0	0	12378	0
1985	0	0	0	15071	23	0	0	0	24	0	25	0	15143	0
1986	0	1	0	14409	8	1	0	0	32	0	26	0	14479	2
1987	0	8	2	14786	22	1	0	0	18	0	45	0	14891	9
1988	0	4	0	12027	14	0	0	0	97	0	15	0	12161	4
1989	0	0	0	14165	0	0	0	0	127	0	30	0	14322	0
1990	0	0	7	11431	0	0	0	0	191	0	0	0	11629	0
1991	0	0	0	8291	0	0	0	0	129	0	0	0	8420	0
1992	0	0	54	4993	164	0	0	0	94	0	149	0	5454	0
1993	0	0	81	3807	0	0	0	0	36	0	102	0	4026	0
1994	0	0	31	4028	0	0	0	0	23	0	170	0	4252	0
1995	0	0	23	4852	0	5	0	0	29	0	39	0	4948	0
1996	0	0	5	9490	0	0	0	0	85	0	62	0	9642	0
1997	0	0	22	17718	0	0	0	0	49	0	135	0	17924	0
1998	0	0	30	21945	2	0	0	0	131	0	102	0	22210	0
1999	0	0	59	17753	0	33	0	0	414	0	193	0	18482	30
2000	0	0	19	15821	6	1	0	0	403	0	185	0	16457	22
2001	0	0	4	15890	8	2	0	0	323	0	148	0	16375	0
2002	0	0	11	24933	2	6	4	0	255	0	177	0	25392	4
2003	0	0	14	27072	4	1	0	0	319	0	185	0	27595	0
2004	0	0	8	23101	1	6	0	0	246	0	186	49	23613	16 Russia
2005	0	0	1	20455	0	0	0	0	257	0	126	0	20839	0 Russia
2006	0	0	1	17154	12	1	0	0	58	0	106	0	17333	1 Greenland
2007	0	0	0	12631	4	0	0	0	69	0	50	0	12767	13 Greenland
2008	0	0	0	7388	3	0	0	0	26	0	65	0	7492	10 Russia
2009	0	0	0	5197	2	0	0	0	8	0	91	0	5305	7 Greenland
2010	0	0	73	5202	1	0	0	0	6	0	0	0	5294	12 Greenland
2011	0	0	0	3540	3	0	0	0	0	0	0	0	3543	0
2012	0	0	0	2613	0	0	3	0	0	0	0	0	2617	1 Greenland
2013	0	0	0	3079	0	0	26	0	0	0	0	0	3105	0
2014	0	0	0	2704	0	0	0	0	1915	0	424	0	5043	0

Faroe Plateau (Sub-division Vb1) HADDOCK. Nominal catches (tonnes) by countries, 2000-2014, as officially reported to ICES.													
	Faroe Islands	France**	Germany	Greenland	Iceland	Norway	Russia	Spain	UK (Engl. and Wales)	UK (Scotland) ^	United Kingdom	Total	Used in the assessment
2000	13,620 ^^	6	1	22 ^^		355			19			14,023	15,821
2001	13,457 ^^	8	2	0 ^^		257 *			4			13,728	15,890
2002	20,776 ^^	2	6	4 ***	4	227			11 ^			21,030	24,933
2003	21,615	4	1			265			14	185		22,084	27,072
2004	18,995	1 ^	6			229	16	49	8	186		19,490	23,101
2005	18,172	+				212			1	126		18,511	20,455
2006	15,600	12 ^	1	1		57			1	106		15,778	17,154
2007	11,689	4 ^		9 ***		61				35		11,798	12,631
2008	6,728	3 ^				26	10			60		6,827	7,388
2009	4,895	2 ^		6 ***		8				64		4,975	5,197
2010	4,932	1		12 ^^		5					73	5,023	5,202
2011	3,350	3		+								3,353	3,540
2012	2,490			1 ***		2						2,493	2,634
2013	2,877				26 ***							2,903	2,950
2014 *	2,704					2					424	3,130	3,194

* Preliminary, ** Including catches from Sub-division Vb2, *** Reported as Division Vb to the Faroese Coastal Guard Service, ^ Reported as Division Vb, ^^ Include Faroese landings reported to the NWWG by FaMRI.

Faroe Plateau (Sub-division Vb2) HADDOCK. Nominal catches (tonnes) by countries, 2000-2014, as officially reported to ICES.							
	Faroe Islands	France	Norway	UK (Engl. and Wales)	UK (Scotland)	Total	
2000	1,565 ^		48	**	185	1,798	
2001	1,948		66	**	148	2,162	
2002	3,698		28	**	177	3,903	
2003	4,934		54	**	***	4,988	
2004	3,594		17	**	**	3,611	
2005	2,444	+	45	**	**	2,489	
2006	1,375		1	***	***	1,376	
2007	810		8		15	833	
2008	556				5	561	
2009	192		3		27	222	
2010	178		1		33	212	
2011	194					194	
2012	141					141	
2013	47					47	
2014 *	63		1			64	

* Preliminary, ** Catches included in Sub-division Vb1, *** Reported as Division Vb, ^ Provided by the NWWG.

Summary of the assessment

Table 4.3.3.10 Haddock in Division Vb. Assessment summary.

Year	Recruitment (age 2)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
1957	35 106	51 049	20 995	0.49
1958	39 212	51 409	23 871	0.627
1959	43 417	48 340	20 239	0.57
1960	35 763	51 101	25 727	0.71
1961	51 279	47 901	20 831	0.562
1962	38 537	52 039	27 151	0.651
1963	47 362	49 706	27 571	0.7
1964	30 110	44 185	19 490	0.475
1965	22 644	45 605	18 479	0.526
1966	20 203	44 027	18 766	0.529
1967	25 356	42 086	13 381	0.403
1968	54 851	45 495	17 852	0.438
1969	31 975	53 583	23 272	0.485
1970	35 600	59 957	21 361	0.476
1971	15 457	63 920	19 393	0.456
1972	33 213	63 133	16 485	0.396
1973	23 702	61 620	18 035	0.29
1974	52 333	64 629	14 773	0.221
1975	70 053	75 403	20 715	0.18
1976	55 971	89 217	26 211	0.248
1977	26 192	96 371	25 555	0.387
1978	35 098	97 226	19 200	0.278
1979	2 784	85 393	12 424	0.155

Year	Recruitment (age 2)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
1980	4 944	81 895	15 016	0.178
1981	3 491	75 838	12 233	0.181
1982	15 834	56 798	11 937	0.331
1983	19 611	51 804	12 894	0.265
1984	40 751	53 809	12 378	0.229
1985	39 401	62 578	15 143	0.276
1986	26 463	65 566	14 477	0.224
1987	9 426	67 252	14 882	0.265
1988	18 745	61 848	12 178	0.201
1989	14 063	51 674	14 325	0.286
1990	9 366	43 625	11 726	0.273
1991	2 978	34 542	8 429	0.276
1992	2 671	26 845	5 476	0.211
1993	1 825	23 081	4 026	0.188
1994	6 417	21 455	4 252	0.207
1995	95 548	22 596	4 948	0.227
1996	45 021	49 415	9 642	0.32
1997	8 940	81 745	17 924	0.374
1998	3 731	81 550	22 210	0.532
1999	15 464	62 452	18 482	0.455
2000	21 253	52 293	15 821	0.28
2001	102 326	60 300	15 890	0.288
2002	60 025	84 291	24 933	0.301
2003	41 743	96 072	27 072	0.454
2004	27 881	86 212	23 101	0.407
2005	8 484	72 930	20 455	0.369
2006	7 667	58 263	17 154	0.349
2007	3 095	43 113	12 631	0.321
2008	2 587	30 308	7 388	0.23
2009	2 342	23 295	5 197	0.264
2010	5 024	17 988	5 202	0.377
2011	15 688	12 722	3 540	0.361
2012	3 137	14 946	2 634	0.289
2013	2 596	17 931	2 950	0.26
2014	8 872	16 479	3 194	0.285
2015	8 558	18 133		

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