

Brill (*Scophthalmus rhombus*) in Subarea 4 and divisions 3.a and 7.d–e (North Sea, Skagerrak and Kattegat, English Channel)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2022 should be no more than 1878 tonnes.

Management of brill and turbot under a combined species TAC prevents effective control of the single-species exploitation rates and could lead to the overexploitation of either species. ICES advises that management should be implemented at the species level in the entire stock distribution area (Subarea 4 and divisions 3.a and 7.d–e).

Stock development over time

Fishing pressure on the stock is below F_{MSY} and stock size is above $MSY B_{trigger}$ (Figure 2).

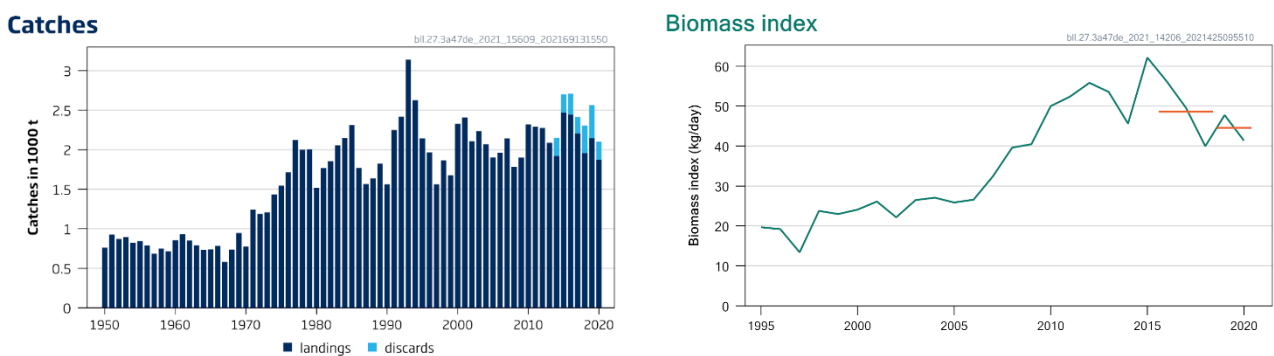


Figure 1 Brill in Subarea 4 and divisions 3.a and 7.d–e. Summary of the stock assessment. Prior to 2014, landings are as officially reported. Discards are available since 2014. Biomass index is the standardized landings per unit effort (LPUE) from the Dutch beam trawl fleet for vessels > 221 kW. The orange horizontal lines indicate the average of the biomass index for 2019–2020 and for 2016–2018.

Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2021a). The standardized landings per unit effort (LPUE) from the Dutch beam trawl fleet (vessels > 221 kW) was used as a biomass index of stock development. The advice is based on a ratio of the mean of the last two index values (index A) and the mean of the three preceding values (index B) multiplied by the recent advised catch.

The index is estimated to have decreased by less than 20% and thus the uncertainty cap was not applied. Stock size is above and fishing pressure is below MSY proxy reference points (Figure 2); therefore, the precautionary buffer was not applied in the advice.

The discard rate (2018–2020) is 14.1% of the total catch.

Table 1 Brill in Subarea 4 and divisions 3.a and 7.d–e. The basis for the catch scenarios.*

Index A (2019–2020)		45 kg day ⁻¹
Index B (2016–2018)		49 kg day ⁻¹
Index ratio (A/B)		0.92
Uncertainty cap	Not applied	-
Advised catch for 2021		2047 tonnes
Discard rate (2018–2020)		14.1%
Precautionary buffer	Not applied	-
Catch advice **		1878 tonnes
Projected landings corresponding to catch advice ***		1613 tonnes
% advice change^		-8.3%

* The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

** [Advised catch for 2021] × [index ratio].

*** [Advised catch for 2021] × [index ratio] × [1–discard rate].

^ Advice value for 2022 relative to the advice value for 2021.

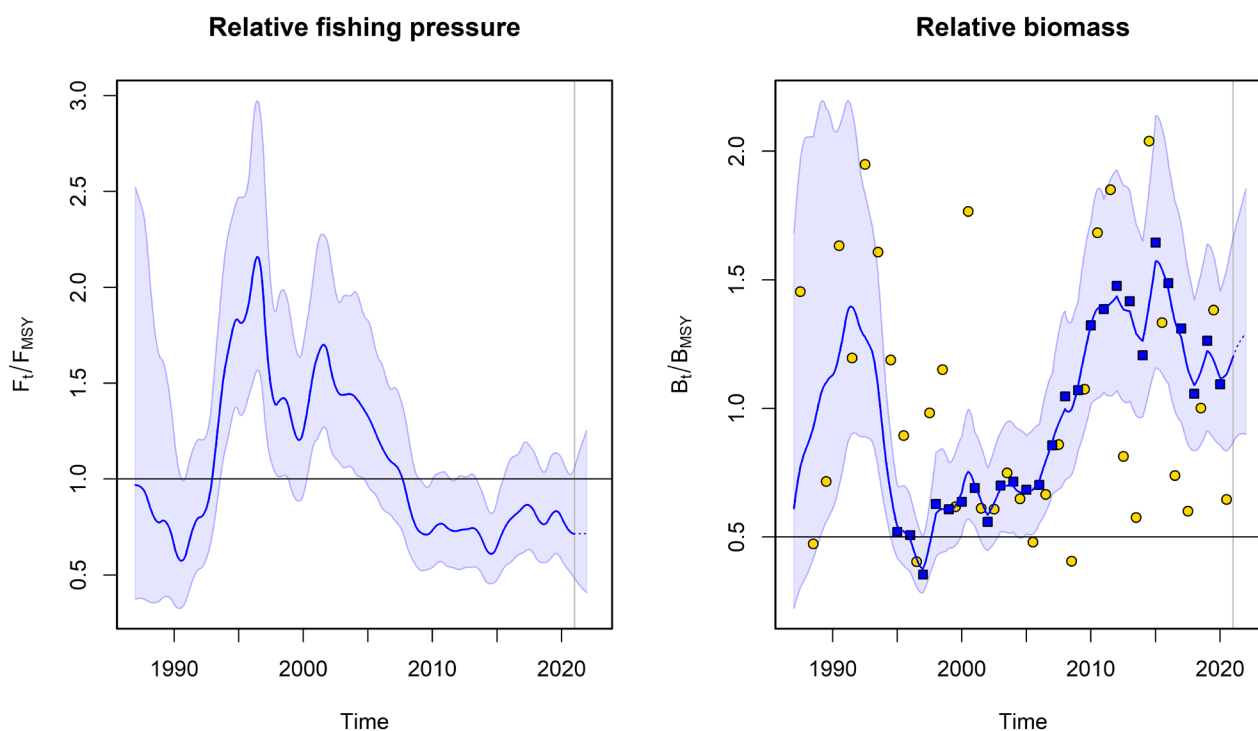


Figure 2 Brill in Subarea 4 and divisions 3.a and 7.d–e. SPiCT model results used for the evaluation of the stock and exploitation status (the proxy F_{MSY} and MSY $B_{trigger}$ are represented by the horizontal lines in the left and right panels, respectively). The yellow dots in the right panel represent the BTS-ISI-Q3 survey (B2453). The blue squares represent the standardized landings per unit effort (LPUE) from the Dutch beam trawl fleet for vessels > 221 kW. The shaded areas in both plots indicate 95% confidence intervals.

Basis of the advice

Table 2 Brill in Subarea 4 and divisions 3.a and 7.d–e. The basis of the advice.

Advice basis	Precautionary approach
Management plan	The EU multiannual plan (MAP) for stocks in the North Sea (EU, 2018) and adjacent waters applies to bycatches of this stock. UK and Norway have not requested ICES to provide advice based on the EU MAP.
	The MAP stipulates that when the F_{MSY} ranges are not available, fishing opportunities should be based on the best available scientific advice.

Quality of the assessment

The current scientific surveys in the stock area are not designed for catching brill, especially large brill. A fisheries-independent survey that had adequate catchability of large flatfish and that covered the entire distribution area of the stock would improve the assessment. To address this issue in future assessments, a Dutch science–industry partnership initiated a new beam trawl survey for turbot and brill in 2019.

Issues relevant for the advice

Brill is mainly a bycatch species in fisheries for plaice and sole. ICES was requested to evaluate the role of TAC in the management of turbot and brill in the North Sea (ICES, 2018). ICES concluded that turbot and brill should be managed using single-species TACs covering an area appropriate to the relevant stock distribution (for brill: Subarea 4, and divisions 3.a and 7.d–e). A TAC combining two high-value species (turbot and brill) under a low TAC can, in some instances, lead to the highgrading of the lesser-valued species (brill).

The assessment uses a commercial biomass index based only on landings; as a result, the index and the advice may be affected when there is a substantial change in discard pattern.

Reference points

Table 3 Brill in Subarea 4 and divisions 3.a and 7.d–e. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{\text{trigger_proxy}}$	$\frac{B}{B_{MSY}} = 0.5^*$	Relative value from SPiCT model. B_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2017)
	F_{MSY_proxy}	$\frac{F}{F_{MSY}} = 1^*$	Relative value from SPiCT model. F_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2017)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	SSB_{mgt}	Not defined		
	F_{mgt}	Not defined		

* No reference points are defined for this stock in terms of absolute values. The SPiCT-estimated values of the ratios F/F_{MSY} and B/B_{MSY} are used to estimate stock and exploitation status relative to the proxy MSY reference points.

Basis of the assessment

Table 4 Brill in Subarea 4 and divisions 3.a and 7.d–e. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2021a)
Assessment type	Commercial lpue trends-based assessment (ICES, 2021b)
Input data	Commercial catches (international landings and discards), one commercial biomass index (lpue, Dutch beam trawl fleet > 221 kW).
Discards and bycatch	Discards are estimated around 14.3% (average 2018–2020). Discards are available from 2014 onwards. In 2020, discards are provided for 59% of the landings.
Additional indicators	SPiCT assessment using landings, the Dutch lpue beam trawl fleet > 221 kW index, and the BTS_ISI_Q3 survey (B2453)
Other information	None
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

History of the advice, catch, and management

Table 5 Brill in Subarea 4 and divisions 3.a and 7.d–e. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Agreed TAC * in Subarea 4 and Division 2.a for turbot and brill	Official landings in Subarea 4 and Division 2.a (turbot and brill)	Official landings in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES landings in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES estimated discards in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES catch in Subarea 4 and divisions 3.a and 7.d–e (brill)
2000		-	9000	5534	2327			
2001		-	9000	5674	2409			
2002		-	6750	5052	2108			
2003		-	5738	4721	2233			
2004		-	4877	4568	2071			
2005		-	4550	4355	1904			
2006		-	4323	4157	1963			
2007		-	4323	4754	2142			
2008		-	5263	4015	1781			
2009		-	5263	4258	1902			
2010		-	5263	4201	2321			
2011		-	4642	4312	2292			
2012	No increase in catch	-	4642	4529	2276			
2013	No new advice, same as for 2012	-	4642	4480	2088			
2014	No more than 20% increase in recent average catch (2010–2012)	< 2727	4642	4132	1978	1920	231	2150
2015	No new advice, same as for 2014	< 2727	4642	4677	2537	2470	230	2700
2016	Precautionary approach (decrease catches by 6%)	< 2756	4488	4953	2415	2444	267	2712
2017	Precautionary approach (same advised catch value as given for 2016)	< 2756	5924	5106	2292	2207	208	2415
2018	Precautionary approach (increase catches by 15%)	< 3170	7102	4422	2027	1956	349	2305
2019	Precautionary approach (same advised catch value as given for 2018)	< 3170	8122	4481**	2172**	2147	417^	2564^

Year	ICES advice	Catch corresponding to advice	Agreed TAC * in Subarea 4 and Division 2.a for turbot and brill	Official landings in Subarea 4 and Division 2.a (turbot and brill)	Official landings in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES landings in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES estimated discards in Subarea 4 and divisions 3.a and 7.d–e (brill)	ICES catch in Subarea 4 and divisions 3.a and 7.d–e (brill)
2020	Precautionary approach	≤ 2559	6498	4370**	1895**	1872^^	229^	2101^
2021	Precautionary approach	≤ 2047***	5848					
2022	Precautionary approach	≤1878						

* EU combined TAC for turbot and brill in EU waters of Division 2.a and Subarea 4.

** Preliminary.

*** The advice of ≤ 2559 tonnes for 2021 (originally drafted in 2019) was updated in 2020.

^ Includes estimated BMS landings.

^^ Includes 2 tonnes of industrial bycatch

History of the catch and landings

Table 6 Brill in Subarea 4 and divisions 3.a and 7.d–e. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings				Discards
	Beam trawls 61%	Otter trawls 29%	Trammel/gillnets 8%	Other gears 2%	
2101 tonnes	1872 tonnes				229 tonnes

Table 7 Brill in Subarea 4 and divisions 3.a and 7.d–e. History of commercial landings; the official estimated values by area for each country participating in the fishery. All weights are in tonnes.

Brill in Division 3.a								
Year	Belgium	Germany	Denmark	Netherlands	Norway	Sweden	BMS landings	Total
1950	0	0	234	0	0	85		319
1951	0	0	260	0	4	73		337
1952	0	0	170	0	1	65		236
1953	0	0	175	0	0	71		246
1954	0	0	155	0	1	78		234
1955	0	0	150	0	0	62		212
1956	0	0	163	0	0	50		213
1957	0	0	110	0	0	38		148
1958	0	0	166	0	0	37		203
1959	0	0	175	0	0	58		233
1960	0	0	272	0	0	46		318
1961	0	0	255	0	0	50		305
1962	0	0	207	0	0	0		207
1963	0	0	120	0	0	0		120
1964	0	0	106	0	0	0		106
1965	0	0	155	0	0	0		155
1966	0	0	187	0	0	0		187
1967	0	0	106	0	0	0		106
1968	0	0	100	0	0	0		100
1969	0	0	99	0	0	0		99
1970	0	0	97	0	0	0		97
1971	0	0	104	0	0	0		104
1972	0	0	120	0	0	0		120
1973	0	0	131	0	0	0		131
1974	0	0	200	0	0	0		200
1975	0	0	167	1	0	19		187
1976	1	0	185	26	0	12		224
1977	1	0	276	99	0	12		388
1978	0	0	178	27	0	11		216
1979	0	0	156	17	0	11		184
1980	2	0	69	1	0	10		82
1981	0	0	54	0	0	5		59
1982	1	0	64	1	0	8		74
1983	0	0	73	3	0	7		83
1984	0	0	89	0	0	8		97
1985	0	0	100	0	0	10		110
1986	0	0	94	0	0	13		107
1987	0	0	93	0	0	12		105
1988	0	0	91	0	0	10		101
1989	0	0	88	0	0	9		97
1990	1	0	116	0	0	11		128
1991	1	0	81	0	7	10		99
1992	1	0	123	0	7	15		146
1993	2	0	184	0	10	16		212

Brill in Division 3.a								
Year	Belgium	Germany	Denmark	Netherlands	Norway	Sweden	BMS landings	Total
1994	0	0	191	0	12	19		222
1995	0	0	124	0	13	14		151
1996	0	0	94	0	12	6		112
1997	0	0	83	0	11	12		106
1998	0	0	108	0	10	14		132
1999	0	0	126	0	13	18		157
2000	0	0	112	0	12	17		141
2001	0	0	73	0	13	12		98
2002	0	0	66	0	12	12		90
2003	0	0	99	1	12	16		128
2004	0	0	119	4	15	18		156
2005	0	0	101	3	16	13		133
2006	0	1	105	3	16	14		140
2007	0	1	119	3	15	22		160
2008	0	2	138	1	13	28		181
2009	0	1	98	1	14	32		146
2010	0	1	95	1	9	16		122
2011	0	1	103	0	15	12		131
2012	0	0	89	0	16	15		120
2013	0	0	70	0	9	13		92
2014	0	0	59	0	8	11		79
2015	0	0	104	11	8	21		145
2016	0	0	125	7	8	28		168
2017	0	0	131	4	8	27		170
2018	0	0	90	9	9	17	< 1	125
2019*	0	2	93	25	3	15	< 1	139
2020*	0	1	112	29	3	17	< 1	162

* Preliminary.

Brill in Subarea 4										
Year	Belgium	Germany	Denmark	France	UK	Netherlands	Norway	Sweden	BMS landings	Total
1950	34	0	39	0	183	108	1	19		384
1951	23	0	53	0	322	93	1	19		511
1952	21	0	65	0	350	117	3	9		565
1953	23	0	49	0	376	130	0	11		589
1954	19	0	53	0	330	106	14	7		529
1955	23	0	51	0	357	137	3	0		571
1956	28	0	47	0	276	156	0	9		516
1957	32	0	27	0	247	154	0	8		468
1958	43	0	42	0	223	162	0	10		480
1959	41	0	30	0	219	125	0	9		424
1960	55	0	37	0	235	150	1	8		486
1961	102	0	40	0	264	166	0	9		581
1962	97	0	42	0	238	214	0	0		591
1963	79	0	59	0	307	175	0	0		620
1964	79	0	46	0	161	279	0	0		565
1965	71	0	56	0	127	281	0	0		535
1966	100	0	63	0	119	264	0	0		546
1967	138	0	29	0	105	137	0	0		409
1968	152	0	43	0	110	274	0	0		579
1969	145	0	47	0	102	364	0	0		658
1970	114	0	42	0	76	386	0	0		618
1971	187	0	72	0	94	720	0	0		1073

Brill in Subarea 4										
Year	Belgium	Germany	Denmark	France	UK	Netherlands	Norway	Sweden	BMS landings	Total
1972	213	0	65	0	51	665	0	0		994
1973	185	0	55	0	39	710	0	0		989
1974	135	0	68	0	44	905	0	0		1152
1975	164	0	76	13	44	925	0	0		1222
1976	148	0	65	10	45	940	0	0		1208
1977	166	0	88	17	60	1079	0	0		1410
1978	175	0	123	26	84	967	0	0		1375
1979	188	0	154	10	103	908	0	0		1363
1980	129	0	104	8	45	747	0	0		1033
1981	148	0	66	5	42	957	0	0		1218
1982	182	0	53	11	41	1007	0	0		1294
1983	182	0	62	23	28	1153	0	0		1448
1984	190	0	73	30	29	1200	0	0		1522
1985	187	0	71	35	46	1370	0	0		1709
1986	131	0	76	4	46	950	0	0		1207
1987	140	0	50	17	48	715	0	0		970
1988	102	0	33	18	52	880	0	0		1085
1989	112	0	43	9	58	1080	0	0		1302
1990	168	0	139	24	82	480	0	0		893
1991	205	38	145	28	147	1111	8	0		1682
1992	203	59	77	34	218	1196	22	1		1810
1993	291	63	118	38	268	1647	14	0		2439
1994	208	90	109	28	235	1235	11	0		1916
1995	194	67	55	24	145	943	6	0		1434
1996	206	47	64	15	175	732	8	0		1247
1997	129	48	38	1	135	590	16	0		957
1998	160	58	58	11	172	808	16	0		1283
1999	161	51	91	0	156	805	16	0		1280
2000	167	77	93	16	141	998	16	0		1508
2001	182	66	67	12	158	1075	13	0		1573
2002	145	58	52	10	120	907	10	0		1302
2003	145	70	57	9	119	934	12	0		1346
2004	140	66	77	7	168	772	19	0		1249
2005	120	62	89	7	138	716	28	0		1160
2006	105	55	75	9	154	765	12	0		1175
2007	110	47	52	12	156	854	9	0		1239
2008	117	42	86	5	93	650	11	0		1004
2009	109	54	96	8	105	786	4	0		1162
2010	104	75	97	12	136	1072	4	0		1499
2011	101	57	122	13	137	1061	6	0		1496
2012	110	71	126	12	122	1084	7	0		1532
2013	101	63	123	10	118	972	4	0		1390
2014	99	69	96	9	117	857	9	0		1255
2015	154	115	122	7	136	1159	1	0		1695
2016	175	90	131	8	156	965	1	0		1526
2017	138	76	121	7	116	1000	2	0		1460
2018	98	80	96	6	100	805	2	0	< 1	1188
2019*	116	132	90	5	110	922	1	0	2	1378
2020*	84	99	95	2	91	809	1	0	< 1	1183

* Preliminary.

Brill in divisions 7.d-e									
Year	Belgium	Denmark	France	UK	Ireland	Netherlands	Channel Islands (UK)	BMS landings	Total
1950	11	0	0	48	0	0	0		59
1951	8	0	0	70	0	0	0		78
1952	6	0	0	66	0	0	0		72
1953	2	0	0	60	0	0	0		62
1954	1	0	0	59	0	0	0		60
1955	4	0	0	57	0	0	0		61
1956	2	0	0	58	0	0	0		60
1957	4	0	0	66	0	0	0		70
1958	2	0	0	65	0	0	0		67
1959	1	0	0	58	0	0	0		59
1960	6	0	0	46	0	0	0		52
1961	1	0	0	46	0	0	0		47
1962	3	0	0	52	0	0	0		55
1963	1	0	0	50	0	0	0		51
1964	0	0	0	60	0	0	0		60
1965	2	0	0	46	0	0	0		48
1966	0	0	0	53	0	0	0		53
1967	1	0	0	66	0	0	0		67
1968	3	0	0	54	0	0	0		57
1969	2	0	121	67	0	0	0		190
1970	10	0	0	49	0	0	0		59
1971	18	0	0	48	0	0	0		66
1972	20	0	0	52	0	3	0		75
1973	20	0	0	70	0	0	0		90
1974	25	0	0	56	0	0	0		81
1975	24	0	55	56	0	0	2		137
1976	41	0	170	72	0	0	2		285
1977	45	0	197	77	0	0	4		323
1978	58	3	227	120	0	0	3		411
1979	55	0	262	140	0	0	2		459
1980	64	2	213	118	3	0	2		402
1981	83	0	271	130	0	0	6		490
1982	105	0	225	149	0	1	7		487
1983	107	0	234	181	0	1	3		526
1984	114	0	226	186	0	0	5		531
1985	94	0	213	177	0	0	10		494
1986	115	0	183	147	0	0	11		456
1987	126	0	216	141	0	0	10		493
1988	112	0	202	133	0	0	5		452
1989	89	0	213	121	0	0	2		425
1990	99	0	249	187	0	0	8		543
1991	81	0	249	140	0	0	0		470
1992	82	0	223	151	0	0	7		463
1993	78	0	256	152	0	0	4		490
1994	88	0	227	170	0	0	5		490
1995	91	0	248	200	1	0	18		558
1996	105	0	240	253	0	0	10		608
1997	107	0	185	198	1	0	10		501
1998	70	0	196	173	0	2	10		451
1999	97	0	0	127	0	3	13		240
2000	164	0	260	232	1	4	17		678
2001	212	0	256	251	0	2	17		738
2002	204	0	268	227	0	1	16		716
2003	217	0	287	238	1	1	15		759

Brill in divisions 7.d–e									
Year	Belgium	Denmark	France	UK	Ireland	Netherlands	Channel Islands (UK)	BMS landings	Total
2004	165	0	259	223	1	3	15		666
2005	138	0	267	183	0	2	21		611
2006	180	0	281	170	0	3	14		648
2007	205	0	325	199	0	1	13		743
2008	155	0	224	199	0	2	16		595
2009	131	0	278	171	0	1	13		594
2010	145	0	340	198	0	1	15		700
2011	141	0	304	202	0	0	18		665
2012	120	0	263	228	0	1	12		624
2013	142	0	238	213	0	1	11		605
2014	166	0	245	219	0	1	13		645
2015	162	0	278	248	0	2	9		698
2016	143	0	286	284	0	1	6		721
2017	135	0	276	246	0	2	3		663
2018	128	0	280	248	1	2	55		714
2019*	103	0	284	262	0	3	2	<1	655
2020*	91	0	209	246	0	2	1	<1	550

* Preliminary.

Summary of the assessment

Table 8 Brill in Subarea 4 and divisions 3.a and 7.d–e. Assessment summary. Weights are in tonnes.

Year	Biomass index (kg × day ⁻¹)	Landings	Discards
1950		762	
1951		926	
1952		873	
1953		897	
1954		823	
1955		844	
1956		789	
1957		686	
1958		750	
1959		716	
1960		856	
1961		933	
1962		853	
1963		791	
1964		731	
1965		738	
1966		786	
1967		582	
1968		736	
1969		947	
1970		774	
1971		1243	
1972		1189	
1973		1210	
1974		1433	
1975		1546	
1976		1717	
1977		2121	
1978		2002	
1979		2006	
1980		1517	

Year	Biomass index (kg × day ⁻¹)	Landings	Discards
1981		1767	
1982		1855	
1983		2057	
1984		2150	
1985		2313	
1986		1770	
1987		1568	
1988		1638	
1989		1824	
1990		1564	
1991		2251	
1992		2419	
1993		3141	
1994		2628	
1995	20	2143	
1996	19	1967	
1997	13	1564	
1998	24	1866	
1999	23	1677	
2000	24	2328	
2001	26	2409	
2002	22	2107	
2003	26	2234	
2004	27	2071	
2005	26	1904	
2006	27	1963	
2007	32	2142	
2008	40	1781	
2009	40	1902	
2010	50	2321	
2011	52	2292	
2012	56	2276	
2013	54	2088	
2014	46	1920	231
2015	62	2470	230
2016	56	2444	267
2017	50	2207	208
2018	40	1956	349
2019	48	2147	417*
2020	41	1872	229*

*Including estimated BMS landings

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