Turbot (*Scophthalmus maximus*) in Division 3.a (Skagerrak and Kattegat)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2024 should be no more than 261 tonnes. If discard rates do not change from the average of the last three years (2020–2022), this implies landings of no more than 234 tonnes.

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 the stock size is above MSY $B_{trigger}$.

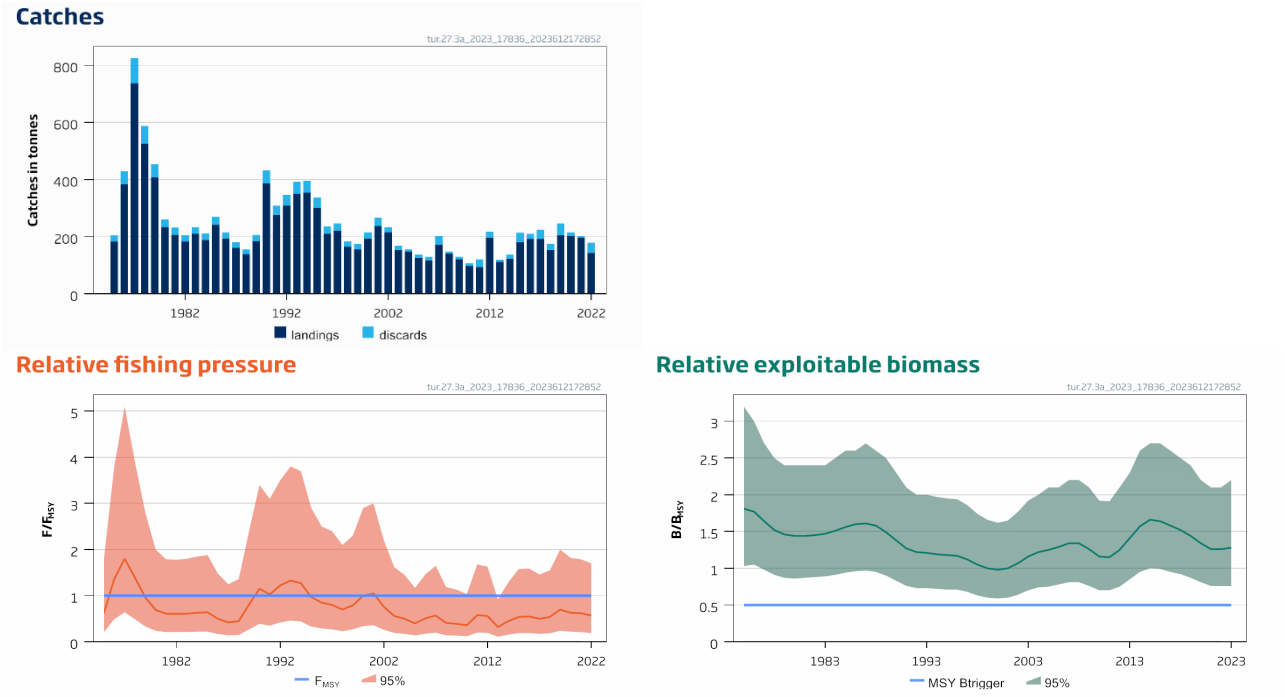

Figure 1 Turbot in Division 3.a. Summary of the stock assessment. Discards are reconstructed prior to 2002.

Conservation status

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

Catch scenarios

Table 1 Turbot in Division 3.a. The basis for the catch scenarios. *

Variable	Value	Notes
F_{2023}/F_{MSY}	0.57	Status quo F: F_{2022}/F_{MSY}
B_{2024}/B_{MSY}	1.28	Short-term forecast (STF).
Catch (2023)	176	STF of catch under F_{sq}; in tonnes.
Discard rate (2023, 2024)	10.0	Average discard rate by weight 2020-2022; in %
Projected landings (2023)	158	STF; assuming average landings ratio; in tonnes.
Projected discards (2023)	18	STF; assuming average discards ratio; in tonnes.

* 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.

Table 2 Turbot in Division 3.a. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2024)	Projected landings (2024)	Projected discards (2024)	Fishing mortality F_{2024}/F_{MSY}	Stock size B_{2025}/B_{MSY}	% B change *	% Advice change**
ICES advice basis							
MSY approach (35th percentile of predicted catch distribution under $F = F_{MSY}$)	261	234	26	0.83	1.27	−0.64	−3.2
Other scenarios							
F_{MSY}	310	279	31	1.00	1.26	−1.68	15.4
$F = F_{2023}$	178	160	18	0.57	1.29	1.06	−34
F = 0	0	0	0	0	1.34	4.7	−100

* Biomass 2025 relative to biomass 2024.

** Advice value for 2024 relative to the advice value for 2023 (269 tonnes).

Basis of the advice

Table 3 Turbot in Division 3.a. The basis of the advice.

Advice basis	MSY 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. 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 statistical method used to combine scientific surveys generates a smoothed stock-size index. The stock assessment model is not designed to use smoothed data and has issues fitting this index. This is not expected to have a great effect on the stock status estimates, but further investigation is needed into how it affects the short-term forecast and the advice.

Issues relevant for the advice

The advice is based on the ICES MSY framework, which is based on the use of the 35th percentile of the projected catch distribution. This is more precautionary than the median and accounts for the estimated uncertainty.

Stock identity and boundaries remain unclear. The benchmark provided some evidence of connectivity with the North Sea and Baltic Sea stocks, as well as the existence of a transition zone in Division 3.a (ICES, 2020a).

Discarding is related to the size of the fish. There is no minimum conservation reference size (MCRS) at EU level.

Reference points

Table 4 Turbot in Division 3.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	$\frac{B}{B_{MSY}} = 0.5$ *	Relative value from the SPiCT model. B_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2020a)
	F_{MSY}	$\frac{F}{F_{MSY}} = 1$ *	Relative value from the SPiCT model. F_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2020a)
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 status relative to the MSY reference points.

Basis of the assessment

Table 5 Turbot in Division 3.a. Basis of the assessment and advice.

ICES stock data category	2 (ICES, 2023a)
Assessment type	SPiCT assessment (ICES, 2023b; Pedersen and Berg, 2017)
Input data	Commercial catches (discard information available since 2002) and a combination of surveys, including the beam trawl survey (BTS; Q3 [B2453]), the North Sea International Bottom Trawl Survey (NS-IBTS; Q1 [G1022] and Q3 [G2829]), the Baltic International Trawl Survey (BITS; Q1 [G2916] and Q4 [G8863]), Fishermen–DTU Aqua sole survey [G4052] and CODS_Q4 survey [G7026]) covering Division 3.a.
Discards and bycatch	Reported discard rates are available for 2002–2022. The average discard rate (10.49%) from 2002–2018 is used to reconstruct the discards in earlier years (1975–2001).
Indicators	None
Other information	Last benchmarked in 2020 (ICES, 2020a).
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 6 Turbot in Division 3.a. ICES advice and official landings. Weights are in tonnes. There is no TAC for turbot in this area. Small differences between catch and the sum of landings and discards are due to rounding.

Year	ICES advice	Catch corresponding to advice	Official landings turbot Division 3.a	ICES landings	ICES discards	ICES catches
2011	No advice	-	99	94	26	120
2012	No increase in catches	-	189	195	23	217
2013	No new advice, same as for 2012	-	111	111	7	118
2014	Reduce recent average catch by 20% (2010–2012)	≤ 102	122	122	15	137
2015	No new advice, same as for 2014	≤ 102	174	180	34	214
2016	Precautionary approach (decrease catches by no more than 20%)	≤ 88	179	191	19	210
2017	Precautionary approach (same advised catch value as given for 2016)	≤ 88	189	192	32	223
2018	Precautionary approach	≤ 84	151	153	23	176
2019	Precautionary approach	≤ 84	198	204	42	246
2020	No catch advice requested	-	191	202	13	215
2021	No catch advice requested	-	192*	195	8	203
2022	Precautionary approach	≤ 224	137*	143	36	179
2023	MSY approach	≤ 269				
2024	MSY approach	≤ 261				

* Preliminary.

History of the catch and landings

Table 7 Turbot in Division 3.a. Catch distribution by fleet in 2022 as estimated by ICES.

Catch	Landings			Discards
179 tonnes	Otter trawl and seines 59.6%	Beam trawl 17.4%	Others 23%	36 tonnes
	143 tonnes			

Table 8 Turbot in Division 3.a. History of commercial landings; official values are presented by area for each country participating in the fishery and total BMS landing for Division 3.a. All weights are in tonnes.

Year	Belgium	Germany	Denmark	UK	Netherlands	Norway	Sweden	BMS landing	Total
1950	0	13	212	0	0	1	73		299
1951	0	6	191	0	0	6	62		265
1952	0	6	114	0	0	3	58		181
1953	0	4	80	0	0	4	51		139
1954	0	0	78	0	0	1	61		140
1955	0	4	77	0	0	0	49		130
1956	0	7	75	0	0	0	41		123
1957	0	3	108	0	0	0	30		141
1958	0	7	112	0	0	0	41		160
1959	0	6	132	0	0	3	43		184
1960	0	11	115	0	0	2	46		174
1961	0	4	130	0	0	0	45		179
1962	0	5	157	0	0	0	0		162
1963	0	4	124	0	0	0	0		128
1964	0	5	89	0	0	0	0		94
1965	0	6	79	1	0	0	0		86
1966	0	2	104	0	0	0	0		106
1967	0	4	68	1	0	0	0		73
1968	0	0	64	0	0	0	0		64
1969	0	1	75	0	0	0	0		76
1970	0	1	76	0	0	0	0		77
1971	0	1	100	0	0	0	0		101
1972	0	2	130	0	0	0	0		132
1973	0	2	98	0	0	0	0		100
1974	0	1	116	0	0	0	0		117
1975	0	2	167	0	7	0	7		183
1976	7	2	178	0	190	0	6		383
1977	7	4	331	0	389	0	5		736
1978	2	4	327	0	186	0	6		525
1979	8	0	307	0	87	0	4		406
1980	7	0	205	1	14	0	6		233
1981	2	0	183	2	12	0	8		207
1982	1	0	164	1	9	0	7		182
1983	4	0	171	0	24	0	10		209
1984	0	0	176	0	0	0	12		188
1985	1	0	224	0	0	0	16		241
1986	2	0	180	0	0	0	11		193
1987	5	0	147	0	0	0	9		161
1988	2	0	115	0	11	0	10		138
1989	2	0	173	0	0	0	9		184
1990	5	0	363	0	0	0	18		386
1991	4	0	244	0	0	7	21		276
1992	4	0	278	0	0	8	19		309
1993	3	2	336	0	0	10	0		351
1994	2	1	313	0	0	15	22		353
1995	4	1	268	0	0	17	11		301
1996	0	1	185	0	0	13	11		210
1997	0	0	200	0	0	9	11		220
1998	0	1	148	0	0	7	8		164
1999	0	1	139	0	0	10	6		156
2000	0	1	180	0	0	6	6		193
2001	0	0	227	0	0	8	3		238
2002	0	1	205	0	0	11	5		222
2003	0	0	128	0	13	14	4		159
2004	0	0	119	0	14	7	7		147

Year	Belgium	Germany	Denmark	UK	Netherlands	Norway	Sweden	BMS landing	Total
2005	0	0	108	0	7	6	6		127
2006	0	1	95	0	8	8	9		121
2007	0	1	138	0	15	7	12		173
2008	0	1	121	0	4	6	11		142
2009	0	1	94	0	2	6	17		120
2010	0	0	72	0	6	4	13		96
2011	0	1	78	0	0	7	13		98
2012	0	< 0.5	167	0	0	8	14		189
2013	0	< 0.5	91	0	0	5	15		112
2014	0	1	94	0	3	6	18		120
2015	0	< 0.5	135	0	20	8	11		175
2016	< 0.5	< 0.5	137	< 0.5	25	6	11		180
2017	0	< 0.5	154	0	16	7	12	< 0.5	189
2018	0	< 0.5	109	0	24	8	10	< 0.5	151
2019	< 0.5	< 0.5	117	0	69	5	7	< 0.5	198
2020	0	< 0.5	124	0	55	5	7	< 0.5	191
2021*	0	1	139	0	39	5	8	0	192
2022*	0	1	106	0	20	4	6	<0.5	137

* Preliminary.

Summary of the assessment

Table 9 Turbot in Division 3.a. Assessment summary. Weights are in tonnes. The relative exploitable biomass, fishing pressure, and their corresponding 95% confidence bounds.

Year	Relative exploitable biomass			Landings	Discards*	Relative fishing pressure		
	Low	B/B_{MSY}	High	tonnes		Low	F/F_{MSY}	High
1975	1.03	1.81	3.2	183	22	0.21	0.62	1.79
1976	1.05	1.77	3.0	383	46	0.49	1.36	3.8
1977	0.98	1.64	2.7	736	88	0.64	1.80	5.1
1978	0.91	1.52	2.5	525	63	0.49	1.39	3.9
1979	0.87	1.46	2.4	406	49	0.33	0.96	2.8
1980	0.86	1.44	2.4	233	28	0.24	0.69	2.0
1981	0.87	1.44	2.4	207	25	0.21	0.61	1.79
1982	0.88	1.45	2.4	182	22	0.21	0.61	1.78
1983	0.89	1.47	2.4	209	25	0.21	0.61	1.80
1984	0.91	1.51	2.5	188	23	0.22	0.63	1.85
1985	0.94	1.56	2.6	241	29	0.22	0.64	1.88
1986	0.96	1.60	2.6	193	23	0.171	0.50	1.48
1987	0.97	1.61	2.7	161	19	0.142	0.42	1.25
1988	0.95	1.58	2.6	138	17	0.148	0.45	1.36
1989	0.9	1.49	2.5	184	22	0.27	0.81	2.4
1990	0.83	1.38	2.3	386	46	0.39	1.15	3.4
1991	0.76	1.27	2.1	276	33	0.35	1.03	3.1
1992	0.73	1.22	2.0	309	37	0.42	1.22	3.5
1993	0.73	1.21	2.0	351	42	0.46	1.33	3.8
1994	0.72	1.19	1.97	353	42	0.44	1.27	3.7
1995	0.71	1.18	1.95	301	36	0.33	0.97	2.9
1996	0.71	1.17	1.94	210	25	0.29	0.85	2.5
1997	0.68	1.12	1.86	220	26	0.27	0.8	2.4
1998	0.63	1.05	1.74	164	20	0.23	0.7	2.1
1999	0.60	1.00	1.66	156	19	0.27	0.79	2.3
2000	0.59	0.98	1.62	193	23	0.34	1.00	2.9
2001	0.60	1.00	1.65	238	28	0.36	1.05	3.0
2002	0.64	1.07	1.77	215	18	0.26	0.76	2.2
2003	0.70	1.16	1.92	153	15	0.194	0.56	1.62
2004	0.74	1.22	2.0	147	9	0.173	0.50	1.45

Year	Relative exploitable biomass			Landings	Discards*	Relative fishing pressure		
	Low	B/B_{MSY}	High	tonnes		Low	F/F_{MSY}	High
2005	0.75	1.25	2.1	126	11	0.139	0.40	1.17
2006	0.78	1.29	2.1	117	12	0.175	0.51	1.46
2007	0.81	1.34	2.2	171	32	0.198	0.57	1.65
2008	0.81	1.34	2.2	140	7	0.141	0.41	1.19
2009	0.76	1.26	2.1	121	9	0.135	0.39	1.13
2010	0.70	1.16	1.92	97	11	0.123	0.36	1.04
2011	0.70	1.15	1.91	94	26	0.20	0.58	1.68
2012	0.75	1.25	2.1	195	23	0.195	0.56	1.63
2013	0.85	1.41	2.3	111	7	0.109	0.32	0.92
2014	0.95	1.57	2.6	122	15	0.156	0.45	1.29
2015	1.00	1.66	2.7	180	34	0.188	0.54	1.58
2016	0.99	1.64	2.7	191	19	0.19	0.55	1.59
2017	0.95	1.58	2.6	192	32	0.174	0.5	1.46
2018	0.92	1.52	2.5	153	23	0.185	0.54	1.55
2019	0.87	1.44	2.4	204	42	0.24	0.70	2.0
2020	0.81	1.34	2.2	202	13	0.22	0.63	1.82
2021	0.76	1.26	2.1	195	8	0.21	0.62	1.79
2022	0.76	1.26	2.1	143	36	0.189	0.57	1.70
2023	0.76	1.28	2.2					

* Since 2018, discards include BMS landings from EU. Discards are reconstructed prior to 2002.

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