

### 6.3.54 Turbot (*Scophthalmus maximus*) in Subarea IV (North Sea)

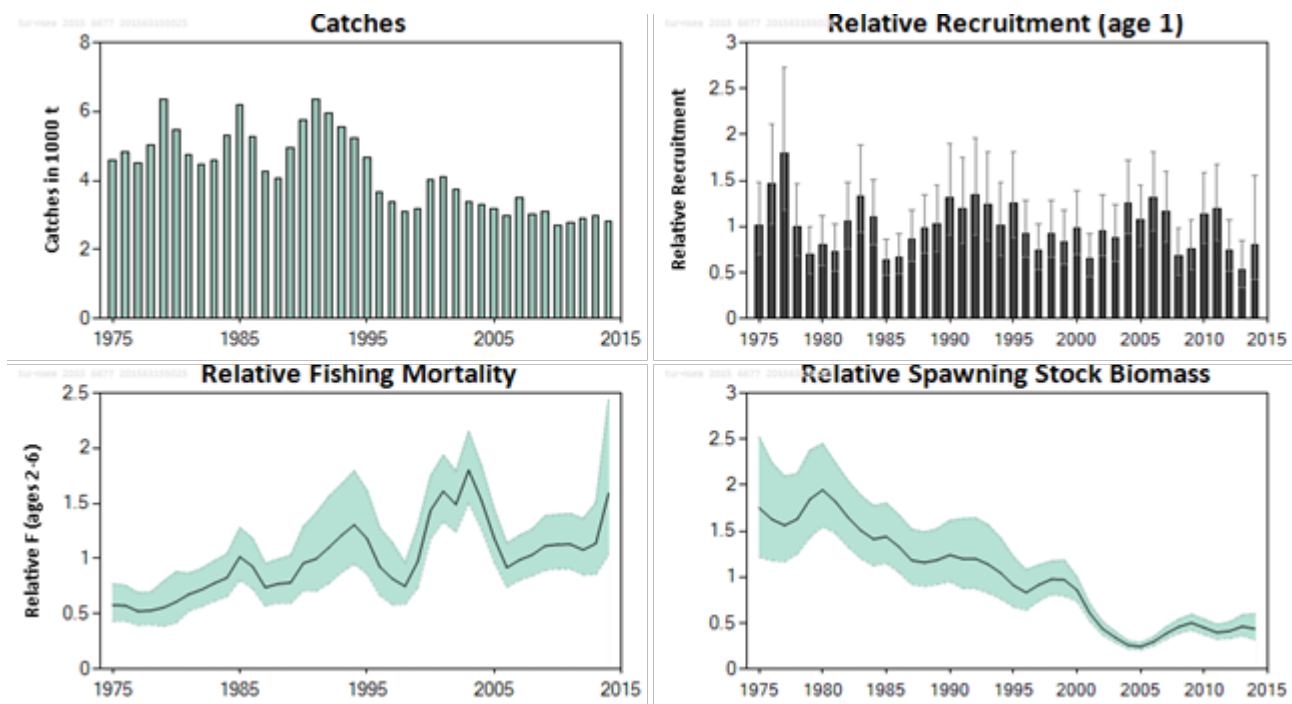
#### ICES stock advice

ICES advises that when the precautionary approach is applied, catches should be no more than 1995 tonnes in each of the years 2016 and 2017. If discard rates do not change from 2014, this implies landings of no more than 1925 tonnes.

Management of turbot and brill under a combined species TAC prevents effective control of the single species exploitation rates and could lead to the overexploitation of either species.

#### Stock development over time

Recruitment is variable without a trend. Fishing mortality (F) is estimated to have increased over time. Spawning-stock biomass (SSB) has decreased and in recent years has stabilised at a low level.



**Figure 6.3.54.1** Turbot in Subarea IV. Official catches and summary of relative median stock trends from the Category 3 assessment with 95% confidence limits. Discards data are only been available for 2014 and not include in the plot\*.

\* Version 2: clarification on the discard data to the caption of the figure added.

**Stock and exploitation status**

**Table 6.3.54.1** Turbot in Subarea IV. State of the stock and fishery, relative to reference points.

		Fishing pressure			Stock size					
		2012	2013	2014	2013	2014	2015			
Maximum Sustainable Yield	$F_{MSY}$	?	?	?	Undefined *	MSY	?	?	?	Undefined *
Precautionary approach	$F_{pa}$ , $F_{lim}$	?	?	?	Undefined *	$B_{pa}$ , $B_{lim}$	?	?	?	Undefined *
Management Plan	$F_{MGT}$	-	-	-	Not applicable	$SSB_{MGT}$	-	-	-	Not applicable
Qualitative evaluation	-	✗	✗	✗	Above possible reference points	-	➡	➡	➡	Stable but low

\*Version 2: text corrected.

**Catch options**

The ICES framework for category 3 stocks was applied (ICES 2012a). An SSB index from an age based assessment indicative of trends was applied as the indicator of stock development. The advice is based on a comparison of the two latest index values (2013-2014) with the three preceding values (2010-2012), multiplied by the recent advised catch (advice for 2015). The index is estimated to have increased by 7%. However, given the uncertainty estimated in the trends-based assessment this is not considered to be a significant change and thus the SSB index is regarded to be stable in recent years.

The SSB index shows a strong decline from historical levels. Current F is likely to be above  $F_{MSY}$  proxies and the overall trend in F is increasing. Therefore, a precautionary buffer needs to be applied.

**Table 6.3.54.2** Turbot in Subarea IV. For stocks in ICES data categories 3-6, one catch option is provided.

Index A (2013-2014)	0.45	
Index B (2010-2012)	0.42	
Index ratio (A/B)	1.07 (1; taking into account uncertainty in the index)	
Uncertainty cap	Not Applied	-
Recent advised catch for 2015	2406 tonnes	
Discard rate (2014)	3.5%	
Precautionary buffer	Applied	0.8
Catch advice*	1995 tonnes	
Landings corresponding to the catch advice	1925 tonnes	

\* recent advised catch x (index ratio x buffer) / (1 - discard rate) [\*\*note: prior to 2015 discards were assumed to be negligible and not incorporated in the catch advice; the catch advice this year takes into account the discard information that became available in 2015].

\*\* Version 2: Note added to clarify discards.

**Basis of the advice**

**Table 6.3.54.4** Turbot in Subarea IV. The basis of the advice.

Advice basis	Precautionary approach
Management plan	There is no management plan for turbot in this area.

**Quality of the assessment**

A complete time series of age composition data is not available. In recent years, these data are derived entirely from the Dutch beam trawl fishery, although otter trawl information was available in 2014. This creates uncertainty in the assessment since a large proportion of the catch comes from other gears. The age composition data needs to be expanded for the whole

area in order to get a better understanding of the state of the stock. Priority should be given to improvement of catch-at-age information available from different countries and fleets (e.g. gillnet fleets).

The age-structured fisheries independent indices used in the trends based assessment are of poor quality. A fisheries independent index covering the entire distribution area of the stock would improve the assessment. The commercial index used is derived from catch and effort data for the Dutch beam trawl fleet. Since 2011, the use of pulse trawls in the Dutch fishery has increased sharply to 74 vessels (of which 65 > 221 kW) and only eight traditional beam trawls are now left. The increased use of pulse trawls and other adaptations like fuel-saving wings may affect catchability and selectivity of North Sea turbot, though this effect has not yet been quantified.

### Issues relevant for the advice

An EU TAC is set for EU waters of Division IIa and Subarea IV together with brill (ICES, 2013a). This does not correspond to the stock areas for either of these stocks. Additionally, management of these stocks under a combined species TAC prevents effective control of the single species exploitation rates and will lead to the overexploitation of either species.

Currently the catches consist predominantly of immature fish, which is having a negative impact on the potential yield from the stock. Since turbot is a fast growing species, reducing the exploitation on younger ages would lead to an increase in maximum sustainable yield. No official minimum landing size has been set, but Belgian and Dutch producer organizations have adopted voluntary minimum landing sizes between 25 and 30 cm, although this still leads to a large proportion of immature fish being caught.

Under the EU landing obligation, which entered into force in 2015, up to 9% inter-species quota transfers between turbot and other target species are allowed for stocks that are considered to be within safe biological limits (see Article 15 of EU, 2013). This stock is at a historical low level and is likely below safe biological limits.

### Reference points

No reference points are defined for this stock

### Basis of the assessment

**Table 6.3.54.6** Turbot in Subarea IV. The basis of the assessment.

ICES stock data category	3.2.0 ( <a href="#">ICES 2015a</a> )
Assessment type	Age-based assessment indicative of trends (SAM, ICES 2015b)
Input data	Commercial catches (episodic age frequencies from catch sampling raised to international catches), two survey indices (SNS, BTS-Isis), one commercial biomass index (NL_BT2). Assumed constant annual maturity ogive and natural mortality (over ages and years).
Discards and bycatch	Not included in the assessment but are used to provide catch advice. 75% of the landings are covered with discard information in 2014.
Indicators	None.
Other information	Last benchmarked in 2012 ( <a href="#">ICES 2012b</a> ). An interbenchmark procedure was conducted in 2014-2015 (ICES, 2015c).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak ( <a href="#">WGNSSK</a> ), Working Group on Mixed Fisheries Advice ( <a href="#">WGMIXFISH-NS</a> ).

### Information from stakeholders

There is no available information.

### History of advice, catch and management

**Table 6.3.54.7** Turbot in Subarea IV. History of ICES advice, the agreed TAC, and ICES estimates of landings. All weights in thousand tonnes.

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC* in IV and IIa turbot & brill	Official landings in IV and IIa turbot & brill	Official landings turbot	ICES estimated landings turbot
2000		-	9	5.534	4.026	
2001		-	9	5.674	4.101	
2002		-	6.750	5.052	3.750	
2003		-	5.738	4.721	3.375	
2004		-	4.877	4.568	3.319	
2005		-	4.550	4.355	3.195	
2006		-	4.323	4.152	2.977	
2007		-	4.323	4.750	3.510	
2008		-	5.263	4.011	3.007	
2009		-	5.263	4.253	3.091	
2010		-	5.263	4.192	2.692	
2011		-	4.642	4.304	2.807	
2012	No increase in catches	-	4.642	4.426	2.914	
2013	No new advice, same as for 2012	-	4.642	4.474	3.084	3.008
2014	Apply $F_{MSY}$ proxy for data limited stocks	< 2.978	4.642	4.128 **	2.834 **	2.872
2015	ICES DLS approach (max.- 20%)	< 2.406	4.642			
2016	Precautionary approach (decrease catches by 20%)	$\leq 1.995$				
2017	Precautionary approach (same advised catch value as given for 2016)	$\leq 1.995$				

\* EU combined TAC for turbot and brill in EU waters of Division IIa and Subarea IV.

\*\* Preliminary.

**History of catch and landings**

**Table 6.3.54.8** Turbot in Subarea IV. Catch distribution by fleet in 2014 as estimated by ICES.

Catch (2014)	Landings			Discards
2. 974 kt	85% trawls (62% beam and 23% otter)	13% gill and trammelnets	2% Other gear types	0.102 kt
	2. 872 kt			

**Table 6.3.54.9** Turbot in Subarea IV. History of landings, preliminary official estimates are presented for each country participating in the fishery. Weights in thousand tonnes.

Year	Netherlands	UK	Denmark	Belgium	France	Germany	Norway	Other**	IV totals
1975	3.349	0.503	0.387	0.159	0.021	0.169	0.000	0.001	4.589
1976	3.253	0.632	0.588	0.147	0.038	0.157	0.000	0.002	4.816
1977	2.973	0.683	0.474	0.146	0.038	0.173	0.000	<0.001	4.486
1978	3.196	0.752	0.693	0.170	0.051	0.174	0.000	<0.001	5.036
1979	3.999	0.838	1.164	0.187	0.022	0.152	0.000	0.003	6.365
1980	3.241	0.559	1.360	0.163	0.017	0.146	0.000	<0.001	5.486
1981	3.073	0.404	1.044	0.142	0.006	0.087	0.000	<0.001	4.756
1982	3.029	0.335	0.880	0.153	0.014	0.043	0.000	<0.001	4.454
1983	3.163	0.277	0.893	0.174	0.024	0.044	0.000	<0.001	4.576
1984	3.800 *	0.282	0.886	0.242	0.040	0.046	0.000	0.001	5.297
1985	4.600 *	0.312	0.983	0.222	0.037	0.034	0.000	<0.001	6.188
1986	3.810 *	0.287	0.997	0.134	0.005	0.032	0.000	<0.001	5.264
1987	2.760 *	0.345	0.988	0.130	0.021	0.028	0.000	<0.001	4.272
1988	2.660	0.328	0.858	0.129	0.024	0.042	0.000	0.001	4.042
1989	3.666	0.333	0.637	0.176	0.030	0.085	0.000	<0.001	4.927
1990	3.732	0.437	1.046	0.292	0.052	0.185	0.000	0.007	5.751
1991	3.780	0.688	1.233	0.350	0.064	0.186	0.030	0.009	6.340
1992	3.495	0.902	0.907	0.317	0.081	0.163	0.066	0.003	5.934
1993	2.939	1.013	0.818	0.355	0.123	0.252	0.047	<0.001	5.547
1994	2.724	0.882	0.862	0.330	0.141	0.263	0.042	<0.001	5.244
1995	2.476	0.703	0.761	0.315	0.108	0.276	0.033	<0.001	4.672
1996	1.776	0.687	0.618	0.210	0.160	0.157	0.036	<0.001	3.644
1997	1.854	0.619	0.479	0.169	0.001	0.215	0.045	<0.001	3.382
1998	1.695	0.582	0.392	0.198	0.022	0.164	0.033	0.001	3.087
1999	1.808	0.488	0.411	0.224	0.000	0.224	0.032	<0.001	3.187
2000	2.280	0.549	0.469	0.302	0.021	0.349	0.055	0.001	4.026
2001	2.226	0.642	0.506	0.333	0.017	0.297	0.079	0.001	4.101
2002	1.898	0.551	0.677	0.244	0.015	0.280	0.085	<0.001	3.750
2003	1.893	0.431	0.486	0.193	0.018	0.289	0.065	0.001	3.375
2004	1.762	0.463	0.518	0.207	0.015	0.278	0.075	0.001	3.319
2005	1.903	0.347	0.429	0.159	0.018	0.274	0.065	<0.001	3.195
2006	1.828	0.381	0.338	0.146	0.022	0.221	0.040	0.001	2.977
2007	2.263	0.485	0.310	0.173	0.033	0.203	0.043	<0.001	3.510
2008	1.744	0.371	0.457	0.182	0.022	0.199	0.033	<0.001	3.007
2009	1.698	0.422	0.548	0.172	0.024	0.197	0.030	<0.001	3.091
2010	1.469	0.385	0.466	0.118	0.037	0.191	0.026	<0.001	2.692
2011	1.540	0.396	0.548	0.122	0.029	0.144	0.028	<0.001	2.807
2012	1.739	0.362	0.482	0.145	0.030	0.120	0.036	<0.001	2.914
2013	1.765	0.374	0.498	0.159	0.040	0.219	0.029	<0.001	3.084
2014	1.540	0.389	0.452	0.175	0.042	0.197	0.038	<0.001	2.834

\* No official landings for the Netherlands between 1984 and 1987. Values are inserted from the IBPNEW report (ICES, 2012).

\*\* "Other" includes Sweden and, in early years, Ireland and Faroe Islands.

### Summary of the assessment

**Table 6.3.54.10** Turbot in Subarea IV. Assessment summary with weights (in tonnes).

Year	Relative						Landings tonnes	Relative		
	Recruitment Age 1	High	Low	SSB tonnes	High	Low		Mean F Ages 2-6	High	Low
1975	1.015	1.478	0.697	1.752	2.523	1.216	4589	0.577	0.771	0.432
1976	1.467	2.107	1.021	1.627	2.243	1.18	4816	0.575	0.757	0.438
1977	1.792	2.729	1.177	1.562	2.096	1.164	4486	0.523	0.692	0.397
1978	1.002	1.47	0.683	1.629	2.122	1.25	5036	0.529	0.695	0.403
1979	0.691	1.001	0.477	1.845	2.377	1.432	6365	0.556	0.794	0.387
1980	0.807	1.122	0.581	1.946	2.448	1.547	5486	0.608	0.879	0.418
1981	0.727	1.022	0.517	1.82	2.241	1.478	4756	0.676	0.868	0.527
1982	1.06	1.476	0.761	1.646	2.044	1.326	4454	0.719	0.91	0.566
1983	1.328	1.877	0.939	1.505	1.886	1.201	4576	0.777	0.98	0.616
1984	1.096	1.513	0.794	1.411	1.773	1.123	5297	0.827	1.042	0.657
1985	0.631	0.863	0.462	1.439	1.802	1.149	6188	1.015	1.279	0.806
1986	0.666	0.916	0.484	1.328	1.675	1.052	5264	0.93	1.186	0.73
1987	0.86	1.184	0.624	1.181	1.517	0.919	4272	0.738	0.955	0.571
1988	0.974	1.348	0.704	1.157	1.489	0.899	4042	0.771	0.994	0.599
1989	1.026	1.455	0.724	1.184	1.524	0.92	4927	0.783	1.029	0.595
1990	1.308	1.898	0.901	1.239	1.614	0.951	5751	0.959	1.29	0.713
1991	1.197	1.748	0.82	1.198	1.633	0.879	6340	0.998	1.412	0.705
1992	1.335	1.96	0.909	1.199	1.642	0.876	5934	1.1	1.561	0.775
1993	1.24	1.815	0.847	1.138	1.568	0.827	5547	1.211	1.674	0.876
1994	1.008	1.479	0.687	1.043	1.423	0.764	5244	1.306	1.794	0.951
1995	1.259	1.812	0.875	0.909	1.219	0.678	4672	1.182	1.618	0.864
1996	0.919	1.285	0.657	0.831	1.079	0.64	3644	0.926	1.28	0.668
1997	0.736	1.027	0.527	0.916	1.13	0.742	3382	0.817	1.145	0.583
1998	0.921	1.289	0.658	0.975	1.172	0.811	3087	0.75	0.961	0.587
1999	0.833	1.174	0.591	0.97	1.184	0.794	3187	0.976	1.294	0.736
2000	0.984	1.393	0.696	0.858	0.998	0.738	4026	1.435	1.747	1.18
2001	0.651	0.927	0.458	0.607	0.706	0.522	4101	1.61	1.937	1.337
2002	0.955	1.338	0.682	0.438	0.516	0.373	3750	1.49	1.79	1.24
2003	0.88	1.24	0.624	0.343	0.406	0.29	3375	1.802	2.152	1.507
2004	1.253	1.718	0.914	0.261	0.307	0.222	3319	1.528	1.842	1.269
2005	1.067	1.454	0.784	0.242	0.284	0.207	3195	1.187	1.451	0.971
2006	1.315	1.807	0.957	0.296	0.347	0.252	2977	0.918	1.139	0.74
2007	1.157	1.6	0.837	0.386	0.455	0.327	3510	0.988	1.211	0.806
2008	0.677	0.975	0.469	0.459	0.539	0.391	3007	1.034	1.267	0.845
2009	0.757	1.075	0.533	0.502	0.595	0.424	3091	1.114	1.387	0.895
2010	1.136	1.59	0.811	0.45	0.54	0.374	2692	1.127	1.399	0.909
2011	1.187	1.677	0.841	0.397	0.484	0.325	2807	1.129	1.406	0.907
2012	0.744	1.072	0.517	0.412	0.511	0.333	2914	1.079	1.362	0.854
2013	0.532	0.845	0.335	0.463	0.589	0.364	3084	1.137	1.507	0.858
2014	0.805	1.547	0.419	0.436	0.6	0.316	2834	1.592	2.439	1.038

## Sources and references

REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC

ICES. 2012a. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68 42pp.

ICES. 2012b. Report of the Inter-Benchmark Protocol on New Species (Turbot and Sea bass; IBPNew 2012), 1–5 October 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:45. 239 pp.

ICES. 2015a. Advice basis. *In* Report of the ICES Advisory Committee, 2015. ICES Advice 2015, Book 1. In preparation.

ICES. 2015b. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 28 April–7 May 2015. ICES CM 2015/ACOM:13.

ICES. 2015c. Report of the Inter-Benchmark Protocol for Turbot in the North Sea (IBP Turbot), 1-30 September 2014, By correspondence. In preparation.