

MSY B_{trigger}

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Turbot (Scophthalmus maximus) in Subarea 4 (North Sea)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2021 should be no more than 3948 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. ICES advises that management should be implemented at the species level.

Note: This advice sheet is abbreviated due to the COVID-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time **Catches** Recruitment (age 1) Recruitment in millions 1996 2002 2008 ■ landings discards ■ BMS Recruitment **∤** 95% Fishing pressure **Spawning Stock Biomass** 20 0.8 15 SSB in 1000 t F (ages 2-6) 0.6 10 0.4 0.2 0 0 1990

Figure 1[†] Turbot in Subarea 4. Summary of the stock assessment (weights in thousand tonnes). Discards are only available from 2013. Shaded areas represent 95% confidence intervals. Assumed recruitment is unshaded. Landings below minimum conservation reference size (BMS) are those officially reported.

Stock and exploitation status

Table 1 Turbot in Subarea 4. State of the stock and the fishery relative to reference points.

95%

		Fishing pressure					Stock size				
		2017	2018	2019			2018	2019	2020		
Maximum sustainable yield	F _{MSY}	•	8	& Above		MSY B _{trigger}	•	•	Above trigger		
Precautionary approach	F _{pa} ,F _{lim}	•	•	Harvested sustainably		B _{pa} ,B _{lim}	•	•	Full reproductive capacity		
Management plan	F _{MGT}	_	_	_		B _{MGT}	_	_	_		

[†] Version 2: Line for F_{pa} corrected.

Catch scenarios

Table 2 Turbot in Subarea 4. Assumptions made for the interim year and in the forecast. All weights are in tonnes, recruitment in thousands.

Variable	Value	Notes
F (2020)	0.36	F_{sq} = average of $F_{ages 2-6}$ (2017–2019)
SSB (2021)	9161	Short-term forecast (STF)
R _{age 1} (2020, 2021)	4563	Geometric mean (1981–2019)
Projected landings (2020)	3402	STF, assuming an F at status quo (F _{sq})

Table 3 Turbot in Subarea 4. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch * (2021)	Projected landings ** (2021)	Projected discards *** (2021)	F (projected landings, ages 2–6) (2021)	SSB (2022)	% SSB change ^	% advice change ^^
ICES advice basis							
MSY approach: F _{MSY}	3948	3514	435	0.36	9449	3.1	-13
Other scenarios							
F _{MSY upper}	4984	4435	549	0.48	8449	-7.8	9.8
F _{MSY lower}	2887	2569	318	0.25	10484	14.4	-36
F = 0	0	0	0	0	13337	46	-100
F _{pa}	4902	4363	540	0.47	8528	-6.9	8
F _{lim}	5980	5322	658	0.61	7498	-18.2	32
F _{sq}	3985	3547	439	0.36	9414	2.8	-12.2
SSB (2022) = B _{lim}	10948	9742	1205	1.69	2974	-68	141
SSB (2022) = B _{pa}	9587	8531	1055	1.28	4163	-55	111
SSB (2022) = MSY B _{trigger}	7194	6402	792	0.79	6353	-31	59
Rollover advice	4537	4038	499	0.43	8879	-3.1	0

^{* (}Projected landings) / (1 – average discard rate); average discard rate by weight 2017–2019 = 11.0%.

The change in advice (-13%) is due to a change in the basis for the advice, from the precautionary approach for 2020 to the MSY approach for 2021.

Quality of the assessment

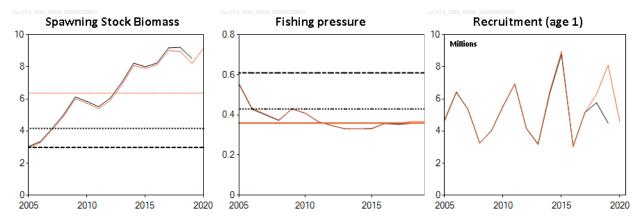


Figure 2 Turbot in Subarea 4. Historical assessment results (final-year recruitment included for each line, corresponding to the forecast recruitment in the interim year).

^{**} Marketable landings.

^{***} Including BMS landings, assuming average discard rate by weight 2017–2019 = 11.0%.

[^] SSB 2022 relative to SSB 2021.

^{^^} Total catch in 2021 relative to the advice value for 2020 (4538 tonnes).

History of the advice, catch, and management

Table 4 Turbot in Subarea 4. ICES advice, ICES estimates of landings and discards, and official landings. All weights are in tonnes.

	tonnes.							
Year	ICES advice	Catch corresp. to advice	Agreed TAC* in Subarea 4 and Division 2.a (turbot and	Official landings in Subarea 4 and Division 2.a (turbot and brill)	Official landings in Subarea 4 (turbot)	ICES landings in Subarea 4 (turbot)	ICES discards in Subarea 4 (turbot)	ICES catch in Subarea 4 (turbot)
			brill)	(tarbot and bring	(tarbot)	(tarbot)	(tarbot)	
2000		-	9000	5534	4026			
2001		_	9000	5674	4101			
2002		-	6750	5052	3750			
2003		-	5738	4721	3375			
2004		_	4877	4568	3319			
2005		-	4550	4355	3195			
2006		-	4323	4152	2977			
2007		-	4323	4750	3510			
2008		-	5263	4011	3007			
2009		-	5263	4253	3091			
2010		-	5263	4192	2692			
2011		-	4642	4304	2807			
2012	No increase in catches	1	4642	4426	2914			
2013	No new advice, same as for 2012	1	4642	4474	3084	2982	97	3079
2014	Apply F _{MSY} proxy for data-limited stocks	< 2978	4642	4128	2871	2834	158	2992
2015	ICES DLS approach (max20%)	< 2406	4642	4677	2978	2922	112	3034
2016	Precautionary approach (decrease catches by 20%)	< 1995	4488	4953	3421	3493	666	4159
2017	Precautionary approach	< 4952	5924	5106	3641	3441	496	3937
2018	Precautionary approach	< 4952	7102	4334 **	3166 **	3140	486	3626
2019	Precautionary approach	< 4952	8122	4476 **	3100 **	3045	230 ^	3275 ^
2020	Precautionary approach	< 4538	6498					
2021	MSY approach	< 3948						

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

^{**} Preliminary.

[^] Including below minimum size (BMS) landings.

Summary of the assessment

Table 5 Turbot in Subarea 4. Assessment summary. Weights are in tonnes, recruitment in thousands. High and low values indicate 95% confidence intervals.

		ecruitmen		nce intervais.	SSB				Official	F (landings)		:)
Year		CCIGITITICIT			335		Landings	Discards^	BMS	Ages	iananig	,
i Cai	Age 1	High	Low	SSB	High	Low	Lanuings	Discarus	landings^	2–6	High	Low
1981	2543	3504	1846	15371	19850	11903	4755		larianigs	0.39	0.48	0.31
1982	4217	5690	3125	13709	17990	10447	4453			0.37	0.46	0.31
1983	6528	8877	4800	12330	16327	9312	4575			0.41	0.50	0.34
1984	5040	6987	3635	11346	14946	8614	5297			0.46	0.55	0.38
1985	2453	3401	1769	11463	14631	8980	6188			0.50	0.61	0.41
1986	3390	4572	2514	10916	13898	8574	5263			0.48	0.58	0.39
1987	3968	5366	2935	9747	12630	7522	4271			0.49	0.60	0.40
1988	3709	5077	2710	8032	10571	6102	4041			0.47	0.58	0.38
1989	4495	6832	2957	8015	10479	6131	4927			0.59	0.72	0.49
1990	5842	9441	3615	6935	9274	5187	5750			0.72	0.90	0.58
1991	5023	7828	3223	5774	8146	4093	6340			0.77	0.97	0.61
1992	4452	6946	2853	5403	7529	3877	5933			0.80	1.02	0.63
1993	4921	7503	3228	4877	6655	3575	5546			0.83	1.05	0.66
1994	3797	5771	2498	4088	5522	3026	5244			0.84	1.05	0.67
1995	4864	6965	3397	3696	4753	2875	4671			0.82	1.02	0.66
1996	3333	4596	2417	3234	4106	2547	3644			0.75	0.91	0.61
1997	2852	3982	2042	3541	4301	2915	3382			0.68	0.86	0.55
1998	4104	5883	2863	3769	4430	3207	3086			0.65	0.80	0.52
1999	3469	5109	2355	3658	4651	2876	3187			0.62	0.76	0.50
2000	5583	8049	3872	4032	5102	3187	4025			0.64	0.79	0.51
2001	3555	5304	2383	3881	4867	3094	4100			0.70	0.86	0.57
2002	5773	7878	4230	3707	4492	3060	3749			0.76	0.96	0.61
2003	4835	6449	3624	3065	3629	2589	3374			0.71	0.85	0.59
2004	6179	8115	4705	2882	3454	2405	3317			0.63	0.76	0.52
2005	4638	6052	3555	2978	3609	2456	3195			0.56	0.68	0.46
2006	6391	8395	4866	3263	4014	2652	2976			0.43	0.54	0.35
2007	5324	6969	4068	4057	4950	3324	3509			0.40	0.50	0.33
2008	3239	4349	2412	4914	6005	4021	3005			0.38	0.46	0.31
2009	3998	5326	3001	6009	7324	4930	3089			0.43	0.53	0.35
2010	5532	7207	4246	5727	7187	4564	2692			0.41	0.50	0.34
2011	6929	9408	5103	5391	6892	4216	2771			0.37	0.45	0.30
2012	4170	5550	3133	5921	7497	4677	2914			0.35	0.43	0.28
2013	3216	4254	2432	6894	8584	5536	2982	97		0.33	0.41	0.27
2014	6481	8496	4944	8080	10049	6497	2834	159		0.33	0.40	0.27
2015	8960	12020	6679	7896	10113	6165	2925	112		0.33	0.41	0.27
2016	3016	4086	2227	8125	10417	6338	3493	666		0.36	0.44	0.29
2017	5142	6837	3867	9023	11265	7227	3441	496		0.36	0.44	0.29
2018	6308	8962	4441	8957	11262	7123	3140	484*	2	0.37	0.45	0.30
2019	8102	13821	4750	8218	10622	6357	3045	227*	3	0.37	0.47	0.29
2020	4563**			8393***								

 $[\]mbox{\ensuremath{^{*}}}$ Since 2018, discards minus BMS landings from EU fleets officially reported in logbooks.

^{**} Geometric mean (1981–2019).

^{***} From the short-term forecast.

 $^{^{\}updayscript{\wedge}}$ Discards and BMS landings are not used in the model.

Sources and references

ICES. 2020. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports, 2:61. http://doi.org/10.17895/ices.pub.6092.

Recommended citation: ICES. 2020. Turbot (Scophthalmus maximus) in Subarea 4 (North Sea). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, tur.27.4. https://doi.org/10.17895/ices.advice.5914.

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Turbot (Scophthalmus maximus) in Subarea 4 (North Sea)

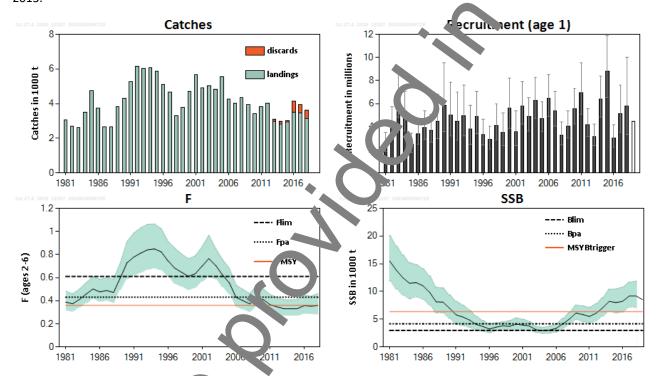
ICES advice on fishing opportunities

In the context of the EU multiannual plan for demersal fisheries in the North Sea, in which this stock considered bycatch, the EC has requested that ICES provide advice based on the precautionary approach. ICES a vises in t catches of up to 4538 tonnes are considered to be precautionary.

ICES advises that turbot should be managed using a single-species TAC covering an area appropriate to the relevant stock distribution (ICES Subarea 4).

Stock development over time

Recruitment (R) is variable without a trend. Fishing mortality (F) has decreased since the r id-1090s, and has been just below F_{MSY} since 2012. The spawning-stock biomass (SSB) has increased since 2005 and has a r an above MSY B_{trigger} since 2013.



Turbot in Subare 4. Summary of the stock assessment (weights in thousand tonnes). Catches only represent landings up to 20 2 shared areas represent 95% confidence intervals. Assumed recruitment is unshaded.

Stock and exploitation status

ICES assesses that fishing, ressure on the stock is below F_{MSY} , F_{pa} , and F_{lim} ; spawning stock size is above MSY $B_{trigger}$, B_{pa} , and B_{lim} .

Table 1 Turboc. barea 4. State of the stock and fishery relative to reference points.

	Fishing pressure						Stock size				
		2016	2017		2018			2017	2018	2019	
Maximon toinable yield	F _{MSY}	•	•	0	Below		MSY B _{trigger}	•	•	Above trigger	
Precautional approach	F _{pa} ,F _{lim}	•	•	•	Harvested sustainably		B _{pa} ,B _{lim}	•	•	Full reproductive capacity	
Management plan	F _{MGT}	_	_	_			B _{MGT}	_	_	_	

Catch options

Table 2 Turbot in Subarea 4. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
F (wanted catch, ages 2–6) (2019)	0.36	F _{sq} = average of F (wanted catch, ages 2–6) (2016–2018).
SSB (2020)	8 559	Short-term forecast; in tonnes.
R _{age 1} (2019, 2020)	4 492	Geometric mean (GM, 1981–2018); in thousands.
Wanted catch (2019)	3 147	Short-term forecast, assuming an F at status quo (F _{sq}); in tonic

Table 3 Turbot in Subarea 4. Annual catch scenarios. All weights are in tonnes.

			10017111 11 61611	to are in torrico.			
Basis	Total	Wanted	Unwanted	F		o∕ sB	% Advice
Dasis	catch *	catch **	catch **	(wanted catches,	(021)	change ***	change ^
	(2020)	(2020)	(2020)	ages 2-6) (2020)	.021)	Change	Change
ICES advice basis							
Precautionary approach: F _{pa}	4538	3902	635	0.47	7753	-9.4	-8.4
Other scenarios							
MSY approach: F _{MSY}	3649	3138	511	0.3	575	0.185	-26
$F_{MSYupper} = 0.48$	4614	3968	646	0.48	7683	-10.2	-6.8
F _{MSY lower} = 0.25	2664	2291	373	0.2	9495	10.9	-46
F = 0	0	0	0	0	12019	40	-100
F _{pa}	4538	3902	635	0.47	7753	-9.4	-8.4
F _{lim}	5545	4768	777	.61	6830	-20	12
F _{sq}	3617	3111	507	0.36	8605	0.53	-27
SSB (2021) = B _{lim}	9945	8552	1393	1.58	2974	-65	101
SSB (2021) = B _{pa}	8542	7346	1196	1.18	4163	-51	73
SSB (2021) = MSY B _{trigger}	6071	5220	85	0.69	6353	-26	23
Roll-over advice	4952	4258	594	0.53	7372	-13.9	0

^{* (}Wanted catch) / (1 – average discard rate); average discard rate 2 16–2 18 = 14.0%.

The decrease in advice (-8.4%) is due to a stanged perception of the stock following an interbenchmark, during which the advice basis for turbot in 27.4 changed from sategory 3 to category 1 (ICES, 2018a, 2018b).

Basis of the advice

Table 4 Turbot in Subarea 4 The basis of the advice.

Advice basis	Prec utic la v approach.
Management plan	The L'Mult annual Plan for the North Sea (EU, 2018) takes bycatch of this species into account. The EC has requested that ICES provide advice based on the precautionary approach.

Quality of the assess nen.

Turbot in Suba, a 4 was interbenchmarked in 2017 and 2018 (ICES, 2018a, 2018b), changing the perception of stock status and tree ds compared with previous advice.

The attramposition of the Dutch landings is available for most of the years, being derived almost entirely from the Dutch beam traw fishery. This creates uncertainty in the assessment, because a large proportion (~33%) of the catch comes from other gears. Danish age-structured data are available from 2014, suggesting a higher average age of turbot in the Danish landings compared to the Dutch beam trawl fishery.

^{** &}quot;Wanted" and "unwanted" catch are used to describe fish the would be landed and discarded in the absence of the EU landing obligation, based on average discard rate estimates for 2016—2018 (1.2.0%); unwanted catch = (wanted catch) × (average discard rate) / (1 – average discard rate).

^{***} SSB 2021 relative to SSB 2020.

[^] Total catch in 2020 relative to advice value for 2018 and 2u 9 (4952 tonnes).

The two age-structured index time-series of fisheries-independent surveys (BTS-ISIS and SNS) used in the assessment show a poor internal consistency, especially for older ages, leading to a poor tracking of cohorts over time. A fisheries-independent survey, having both adequate catchability of large flatfish and covering the entire distribution area of the stock, is needed to improve the assessment. To address this issue in future assessments, a Dutch science—industry partnership initiated a new fisheries-independent beam trawl survey for turbot and brill in 2019.

An age-aggregated landing per unit of effort index has been available since 1995 and is derived from landings and effort data for the Dutch beam trawl fleet. This index has the most weight in estimating the final pamass and strongly influences the trend in the assessment. Measures taken by the Dutch Producers Organization in remonse to quota limitation may have biased this index.

Discards are not included in the current assessment but are used to provide advice.

Issues relevant for the advice

The basis for the advice this year is the precautionary approach, as requested by the European Commission.

The precautionary advice for this stock is based on a constant fishing mort lity t_1 , t_2 has a low probability of bringing SSB below B_{lim} in the long term ($F_{P.05} = 0.47$; see ICES, 2018c). This would imply an increase in F compared to current levels, and is also well above F_{MSY} (0.36)..

ICES was requested to evaluate the role of TAC in the fisheries mana emen of turbot and brill in the North Sea (ICES, 2018d). ICES concluded that fisheries on turbot and brill should be many redusing single-species TACs that cover an area appropriate to the relevant stock distribution (for turbot this in ICE). Subarea 4). Additionally, management of these stocks under a combined species TAC may hinder effective management of the exploitation rates of the individual species and could lead to the overexploitation of either species.

Since 1 January 2019, turbot in Subarea 4 is under the FU andig obligation, without exemptions. Discarding for this stock has historically been very limited; however, there is now indications that in the past years discarding has increased, partly as a result of Producer Organization (FQ) measures (including a minimum landing size) which aim to prevent early exhaustion of the landing quota. Furtherm, the estimated discard rates have remained high in 2017 and 2018 compared to earlier years, in spite of PO measures being relaxed from 2017 onwards.

Currently, the catches consist predominantly of in....ature fish, which is having a negative impact on the potential yield from the stock. As turbot is a fast-growing species, reduction in the exploitation on younger ages would lead to an increase in maximum sustainable yield.

Reference points

Table 5 Turbot in Subare 4. Jeff tence points, values, and their technical basis. All weights are in tonnes.

Table 3	Turbot iii Subarc	ii en enec per	ints, values, and their teeninear basis. All weights are in torines.	
Framework	Reference point	alue	Technical basis	Source
MCV approach	MCY B _{trig}	6353	Fifth percentile of the SSB at MSY.	ICES (2018b)
MSY approach	F _M .	0.36	EQsim analysis based on the recruitment period 1981–2017.	ICES (2018b)
	lim	2974	B _{lim} was set to B _{loss} .	ICES (2018b)
Precautionary	B	4163	$B_{lim} \times exp(1.645 \times 0.2) \approx 1.4 \times B_{lim}$.	ICES (2018b)
approach	Lim	0.61	EQsim analysis based on the recruitment period 1981–2017.	ICES (2018b)
	F _{pa}	0.47	F _{P.05} without ICES advice rule.	ICES (2019)
Management	⊳B _{mgt}	Not defined		
plan	F _{mgt}	Not defined		

Basis of the assessment

Table 6 Turbot in Subarea 4. Basis of the assessment and advice.

ICES stock data category	1 (<u>ICES, 2018c</u>).
Assessment type	Age-based analytical assessment (SAM; ICES, 2018b) that uses landings in the model are the forecast.
Input data	Commercial landings raised to international landings, two survey indices (SNS, BTS-Is), one standardized commercial biomass index (NL_BT2). Assumed constant annual maturity (over years) and natural mortality (over ages and years).
Discards and bycatch	Discard data are not included in the assessment, but are used to provide catch a vice. The discard rate was 14% (average of 2016–2018). 69% of the landings include discard information in 201, and 4% of the discards were sampled for age.
Indicators	None.
Other information	An interbenchmark procedure was conducted for this stock in July 20 12, shalling the perception of the stock and upgrading the stock to a category 1 assessment (ICES, 20 8b).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea at 1 SV gerrak (WGNSSK)

Information from stakeholders

The Dutch demersal fishing industry provided information on national produce organization (PO) measures that are meant to prevent early exhaustion of the combined TAC for turbot and brill. These measures included the introduction in 2013 of a minimum landing size for turbot and brill of 27 cm; this was increased in 2016, first to 30 cm and then to 32 cm. Furthermore, the measures include an overall cap on landings per trip information on the market categories in the landings suggest that the smaller market categories are increasingly libsent from the landings (2016 and 2017), while these smaller market categories were landed by flag vessels that we not under the Dutch PO measures. However, following the increase in catch advice in 2018–2019, PO measures were relaxed.

History of the advice, catch, and management

Table 7 Turbot in Subarea 4. ICES advice and official landing. All weights are in tonnes.

Year	ICES advice	Catch corresp. to advice	Agreed TAC in 4 and 2.a turbot & briii	Official randings in 4 and 2.a turbot & brill	Official landings in 4 turbot	ICES estimated landings turbot	ICES estimated discards	ICES total
2000		-	90 0	5534	4026			
2001		-	90 0	5674	4101			
2002		-	6750	5052	3750			
2003			5738	4721	3375			
2004		ζ (-	4877	4568	3319			
2005			4550	4355	3195			
2006		4	4323	4152	2977			
2007			4323	4750	3510			
2008		-	5263	4011	3007			
2009		-	5263	4253	3091			
2010		-	5263	4192	2692			
2011	•	1	4642	4304	2807			
2012	No increase in catches	-	4642	4426	2914			
2013	No new advice, salve as for 2012	-	4642	4474	3084	2982	97	3079
2014	Apply F _{ISY} prove for data-line ited stocks	< 2978	4642	4128	2871	2834	158	2992
2015	max	< 2406	4642	4677	2978	2922	112	3034
2016	P autionary app pach (decrease catches by 20%)	< 1995	4488	4953	3421	3493	666	4159
2017	Precautionary approach	< 4952	5924	5106	3641	3441	496	3937

Year	ICES advice	Catch corresp. to advice	Agreed TAC* in 4 and 2.a turbot & brill	Official landings in 4 and 2.a turbot & brill	Official landings in 4 turbot	ICES estimated landings turbot	ICES estimated discards	ICES total
2018	Precautionary approach	< 4952	7102	4337**, ^	3168**, ^	3140	486	3626
2019	Precautionary approach	< 4952	8122					
2020	Precautionary approach	< 4538						

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

History of the catch and landings

 Table 8
 Turbot in Subarea 4. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)		Discards		
2626 tannas	Beam trawls 67%	Bottom trawls 25%	Othe gears 8%	49C to 222
3626 tonnes		486 tonnes		

Table 9 Turbot in Subarea 4. History of commercial landings; the one ial estimated values by country. All weights are in tonnes

Year Netherlands UK Demmark Belgium France Ger Jany Norway Other** Total 1975 3349 503 387 159 2 169 0 1 4589 1976 3253 632 588 147 8 157 0 2 4816 1977 2973 683 474 146 38 173 0 1 4486 1979 3999 838 1164 187 22 152 0 3 6365 1980 3241 559 1360 10 17 146 0 1 5486 1981 3073 404 1044 42 6 87 0 1 4456 1982 3029 335 880 13 14 43 0 1 4576 1983 3163 277 893 12 24 44 0 1		tonnes.								
1976	Year	Netherlands	UK	Denmark	Belgium	France	Ger lany	Norway	Other**	Total
1977 2973 683 474 146 38 173 0 1 4486 1978 3196 752 693 170 51 174 0 1 5036 1980 3241 559 1360 10 17 146 0 1 5486 1981 3073 404 1044 42 6 87 0 1 4756 1982 3029 335 880 11 14 43 0 1 4454 1983 3163 277 893 12 24 44 0 1 5267 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 9 130 21 28 0 1 4272	1975	3349	503	387	159	-	169	0	1	4589
1978	1976	3253	632	588	147		157	0	2	4816
1979 3999 838 1164 187 22 152 0 3 6365 1980 3241 559 1360 16 17 146 0 1 5486 1981 3073 404 1044 42 6 87 0 1 4756 1982 3029 335 880 15 14 43 0 1 4756 1983 3163 277 893 1 24 44 0 1 4576 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 3112 983 222 37 34 0 1 5264 1987 2760* 345 96 130 21 28 0 1 4272 1988 2660 328 5 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4042 1990 3732 437 6 292 52 185 0 7 5751 1991 3780 688 125 350 64 186 30 9 6340 1992 3495 502 907 317 81 163 66 3 5934 1993 2939 97 818 355 123 252 47 1 5244 1995 2476 7 7 618 210 160 157 36 1 1996 1775 67 618 210 160 157 36 1 1997 1154 619 479 169 1 215 45 1 382 1998 169 582 392 198 22 164 33 1 3087 2000 2280 549 469 302 21 349 55 1 3382 2004 1762 463 518 207 15 278 75 1 3119 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 388 146 22 221 40 1 2977 2008 1744 371 457 182 22 199 33 1 3007	1977	2973	683	474	146	28	173	0	1	4486
1980 3241 559 1360 10 17 146 0 1 5486 1981 3073 404 1044 12 6 87 0 1 4756 1982 3029 335 880 1 14 43 0 1 4456 1983 3163 277 893 1 24 44 0 1 4576 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 47 134 5 32 0 1 4272 1988 2660 328 8 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927	1978	3196	752	693	170	51	174	0	1	5036
1981 3073 404 1044 42 6 87 0 1 4756 1982 3029 335 880 15 14 43 0 1 4454 1983 3163 277 893 17 24 44 0 1 4576 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 47 134 5 32 0 1 5264 1987 2760* 345 98 130 21 28 0 1 4272 1988 2660 328 8 129 24 42 0 1 402 1989 3666 333 63 176 30 85 0 1 4927	1979	3999	838	1164	187	22	152	0	3	6365
1982 3029 335 880 1. 14 43 0 1 4454 1983 3163 277 893 1. 24 44 0 1 4576 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 67 134 5 32 0 1 5264 1987 2760* 345 98 130 21 28 0 1 4272 1988 2660 328 68 129 24 42 0 1 4022 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 46 292 52 185 0 7 5751	1980	3241	559	1360	10	17	146	0	1	5486
1983 3163 277 893 17. 24 44 0 1 4576 1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 47 134 5 32 0 1 5264 1987 2760* 345 98. 130 21 28 0 1 4272 1988 2660 328 6.3 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 -6 292 52 185 0 7 5751 1991 3780 688 125 350 64 186 30 9 6340 <tr< td=""><td>1981</td><td>3073</td><td>404</td><td>1044</td><td>42</td><td>6</td><td>87</td><td>0</td><td>1</td><td>4756</td></tr<>	1981	3073	404	1044	42	6	87	0	1	4756
1984 3800* 282 886 242 40 46 0 1 5297 1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 47 134 5 32 0 1 5264 1987 2760* 345 96 130 21 28 0 1 4272 1988 2660 328 68 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 46 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 902 907 317 81 163 366 3 5934 <t< td=""><td>1982</td><td>3029</td><td>335</td><td>880</td><td>15</td><td>14</td><td>43</td><td>0</td><td>1</td><td>4454</td></t<>	1982	3029	335	880	15	14	43	0	1	4454
1985 4600* 312 983 222 37 34 0 1 6188 1986 3810* 287 617 134 5 32 0 1 5264 1987 2760* 345 95 130 21 28 0 1 4272 1988 2660 328 8 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 7.6 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 902 907 317 81 163 66 3 5934 1993 2939 91 818 355 123 252 47 1 5547 <	1983	3163	277	893	1	24	44	0	1	4576
1986 3810* 287 47 134 5 32 0 1 5264 1987 2760* 345 90 130 21 28 0 1 4272 1988 2660 328 8 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 76 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 902 907 317 81 163 66 3 5934 1993 2939 015 818 355 123 252 47 1 5547 1994 2724 8c 862 330 141 263 42 1 547 <t< td=""><td>1984</td><td>3800*</td><td>282</td><td>886</td><td>242</td><td>40</td><td>46</td><td>0</td><td>1</td><td>5297</td></t<>	1984	3800*	282	886	242	40	46	0	1	5297
1987 2760* 345 9a 130 21 28 0 1 4272 1988 2660 328 68 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 66 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 J02 907 317 81 163 66 3 5934 1993 2939 013 818 355 123 252 47 1 5547 1994 2724 8a 862 330 141 263 42 1 5244 1995 2476 73 761 315 108 276 33 1 4672	1985	4600*	312	983	222	37	34	0	1	6188
1988 2660 328 68 129 24 42 0 1 4042 1989 3666 333 63 176 30 85 0 1 4927 1990 3732 437 66 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 502 907 317 81 163 66 3 5934 1993 2939 915 818 355 123 252 47 1 5547 1994 2724 86 862 330 141 263 42 1 5247 1994 2724 86 862 330 141 263 42 1 5244 1995 2476 73 761 315 108 276 33 1 4672	1986	3810*	287	¢. 17	134	5	32	0	1	5264
1889 3666 333 63 176 30 85 0 1 4927 1990 3732 437 46 292 52 185 0 7 5751 1991 3780 688 125 350 64 186 30 9 6340 1992 3495 J02 907 317 81 163 66 3 5934 1993 2939 D1 818 355 123 252 47 1 5547 1994 2724 8 862 330 141 263 42 1 5244 1995 2476 7 3 761 315 108 276 33 1 4672 1996 177 6 7 618 210 160 157 36 1 3644 1997 164 619 479 169 1 215 45 1 <td>1987</td> <td>2760*</td> <td>345</td> <td>96</td> <td>130</td> <td>21</td> <td>28</td> <td>0</td> <td>1</td> <td>4272</td>	1987	2760*	345	96	130	21	28	0	1	4272
1990 3732 437 46 292 52 185 0 7 5751 1991 3780 688 123 350 64 186 30 9 6340 1992 3495 302 907 317 81 163 66 3 5934 1993 2939 013 818 355 123 252 47 1 5547 1994 2724 86 862 330 141 263 42 1 5244 1995 2476 73 761 315 108 276 33 1 4672 1996 1776 67 618 210 160 157 36 1 3644 1997 164 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 </td <td>1988</td> <td>2660</td> <td>328</td> <td>0 8</td> <td>129</td> <td>24</td> <td>42</td> <td>0</td> <td>1</td> <td>4042</td>	1988	2660	328	0 8	129	24	42	0	1	4042
1991 3780 688 123 350 64 186 30 9 6340 1992 3495 502 907 317 81 163 66 3 5934 1993 2939 013 818 355 123 252 47 1 5547 1994 2724 85 862 330 141 263 42 1 5244 1995 2476 7 3 761 315 108 276 33 1 4672 1996 1776 637 618 210 160 157 36 1 3644 1997 1654 619 479 169 1 215 45 1 3382 1998 165 582 392 198 22 164 33 1 3087 1999 1 23 488 411 224 0 224 32 <	1989	3666	333	63	176	30	85	0	1	4927
1992 3495 902 907 317 81 163 66 3 5934 1993 2939 013 818 355 123 252 47 1 5547 1994 2724 88 862 330 141 263 42 1 5244 1995 2476 7 3 761 315 108 276 33 1 4672 1996 1776 6.7 618 210 160 157 36 1 3644 1997 1.54 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 1999 1.02 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1	1990	3732	437	+6	292	52	185	0	7	5751
1993 2939 015 818 355 123 252 47 1 5547 1994 2724 88 862 330 141 263 42 1 5244 1995 2476 7 3 761 315 108 276 33 1 4672 1996 177 6.7 618 210 160 157 36 1 3644 1997 164 619 479 169 1 215 45 1 3382 1998 165 582 392 198 22 164 33 1 3087 1999 1.02 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.6 642 506 333 17 297 79 1 4101 <	1991	3780	688	125.	350	64	186	30	9	6340
1994 2724 86 862 330 141 263 42 1 5244 1995 2476 73 761 315 108 276 33 1 4672 1996 1776 637 618 210 160 157 36 1 3644 1997 1154 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 1999 1.20 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.6 642 506 333 17 297 79 1 4101 2002 398 551 677 244 15 280 85 1 3750 </td <td>1992</td> <td>3495</td> <td>ر 20د</td> <td>907</td> <td>317</td> <td>81</td> <td>163</td> <td>66</td> <td>3</td> <td>5934</td>	1992	3495	ر 20د	907	317	81	163	66	3	5934
1995 2476 7 3 761 315 108 276 33 1 4672 1996 1776 6.7 618 210 160 157 36 1 3644 1997 1154 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 1999 1.08 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.66 642 506 333 17 297 79 1 4101 2002 398 551 677 244 15 280 85 1 3750 204 1893 431 486 193 18 289 65 1 3375 <	1993	2939	71/3	818	355	123	252	47	1	5547
1996 1775 637 618 210 160 157 36 1 3644 1997 11 54 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 1999 100 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2 16 642 506 333 17 297 79 1 4101 2002 398 551 677 244 15 280 85 1 3750 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 <	1994	2724	86	862	330	141	263	42	1	5244
1997 1(54) 619 479 169 1 215 45 1 3382 1998 169 582 392 198 22 164 33 1 3087 1999 1.02 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.16 642 506 333 17 297 79 1 4101 2002 3.98 551 677 244 15 280 85 1 3750 200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 <	1995	2476		761	315	108	276	33	1	4672
1998 169 582 392 198 22 164 33 1 3087 1999 1.72 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.66 642 506 333 17 297 79 1 4101 2002 3.398 551 677 244 15 280 85 1 3750 200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	1996	1/7	° 57	618	210	160	157	36	1	3644
1999 100 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2 6 642 506 333 17 297 79 1 4101 2002 398 551 677 244 15 280 85 1 3750 200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 <td>1997</td> <td>1054</td> <td>619</td> <td>479</td> <td>169</td> <td>1</td> <td>215</td> <td>45</td> <td>1</td> <td>3382</td>	1997	1054	619	479	169	1	215	45	1	3382
1993 1 488 411 224 0 224 32 1 3187 2000 2280 549 469 302 21 349 55 1 4026 2001 2.06 642 506 333 17 297 79 1 4101 2002 3.98 551 677 244 15 280 85 1 3750 200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 <td>1998</td> <td>169</td> <td>582</td> <td>392</td> <td>198</td> <td>22</td> <td>164</td> <td>33</td> <td>1</td> <td>3087</td>	1998	169	582	392	198	22	164	33	1	3087
2001 2 16 642 506 333 17 297 79 1 4101 2002 398 551 677 244 15 280 85 1 3750 200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	1999	70	488	411	224	0	224	32	1	3187
2002 398 551 677 244 15 280 85 1 3750 2004 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	2000	2280	549	469	302	21	349	55	1	4026
200 1893 431 486 193 18 289 65 1 3375 2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	2001	2 .76	642	506	333	17	297	79	1	4101
2004 1762 463 518 207 15 278 75 1 3319 2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	2002	398	551	677	244	15	280	85	1	3750
2005 1903 347 429 159 18 274 65 1 3195 2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	200	1893	431	486	193	18	289	65	1	3375
2006 1828 381 338 146 22 221 40 1 2977 2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	2004	1762	463	518	207	15	278	75	1	3319
2007 2263 485 310 173 33 203 43 1 3510 2008 1744 371 457 182 22 199 33 1 3007	2005	1903	347	429	159	18	274	65	1	3195
2008 1744 371 457 182 22 199 33 1 3007	2006	1828	381	338	146	22	221	40	1	2977
	2007	2263	485	310	173	33	203	43	1	3510
2009 1698 422 548 172 24 197 30 1 3091	2008	1744	371	457	182	22	199	33	1	3007
	2009	1698	422	548	172	24	197	30	1	3091

^{**} Preliminary.

 $[\]mbox{\ensuremath{^{\Lambda}}}$ Including below minimum size (BMS) landings.

Year	Netherlands	UK	Denmark	Belgium	France	Germany	Norway	Other**	Total
2010	1469	385	466	118	37	191	26	1	2692
2011	1540	396	548	122	29	144	28	1	2807
2012	1739	362	482	145	30	120	36	1	2914
2013	1765	374	498	159	40	219	29)	3084
2014	1540	389	452	175	42	197	38	1	2834
2015	1739	336	392	215	46	236	10	7	2978
2016	1854	404	505	339	38	273	8	1	3421
2017	2118	397	486	336	40	252	13	1	3641
2018^	1855^^	367	331	268^^	27	304	15	Ţ	3168

^{*} No official landings are available for the Netherlands between 1984 and 1987. Values are inserted from the IBPNew report (ICES, 2012).

Summary of the assessment

Table 10 Turbot in Subarea 4. Assessment summary. Weights are in tonner High and low values indicate the 95% confidence intervals.

Near		intervais.										
Tell			Recruitment			SSB		Landings	Discards	F	(per year)
1981 2558 3531 1854 15508 20091 1191 3074 0.39 0.48 0.9982 4233 5721 3133 13841 18228 10709 2705 0.37 0.46 0.9984 5053 7041 3626 11478 1578 675 3514 0.46 0.56 0.9885 2457 3421 1765 11592 1487 9043 4749 0.50 0.61 0.9885 2457 3421 1765 11592 1487 9043 4749 0.50 0.61 0.9886 3385 4572 2507 11040 14 5 635 3730 0.48 0.58 0.9988 3678 5046 2681 8126 107 6145 2659 0.47 0.59 0.9988 3678 5046 2681 8126 107 6145 2659 0.47 0.59 0.999 0.999 5841 9504 3590 6982 85 5194 4282 0.73 0.91 0.999 0.991 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0.999 0.992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0.999 4894 7078 3324 2491 4064 5526 2988 6081 0.85 1.06 0.999 3339 4622 2 12 2338 4142 2531 5118 0.75 0.91 0.999 3339 4622 2 12 3238 4142 2531 5118 0.75 0.91 0.999 0.999 3487 5163 2355 3311 4751 2898 3764 0.61 0.76 0.76 0.900 5632 8215 861 4100 5229 3215 4696 0.63 0.79 0.	Year	Age 1	High	Low	SSB	High	Low	Landings	Discards	Ages	High	Low
1982 4233 5721 3133 13841 18228 10509 2705 0.37 0.46 0.48 1983 6540 8914 4799 12461 16567 97.2 2619 0.41 0.50 0.48 1984 5053 7041 3626 11478 15.2 675 3514 0.46 0.56 0.49 1985 2457 3421 1765 11592 1485 9043 4749 0.50 0.61 0.50 1985 3385 4572 2507 11040 14.15 635 3730 0.48 0.58 0.49 0.60 0.49			thousands			tonnes		ton	nes	2–6	High	LOW
1983	1981	2558	3531	1854	15508	20091		3074		0.39	0.48	0.31
1984 5053 7041 3626 11478 1518 6675 3514 0.46 0.56 0.56 0.58 1985 2457 3421 1765 11592 14876 9043 4749 0.50 0.61 0.50 0.61 0.58	1982	4233	5721	3133	13841	18228	10509	2705		0.37	0.46	0.30
1985	1983	6540	8914	4799	12461	16567	97 /2	2619		0.41	0.50	0.34
1986 3385 4572 2507 11040 14 15 6335 3730 0.48 0.58 0 1987 3950 5349 2917 9862 283 7578 2670 0.49 0.60 0 1988 3678 5046 2681 8126 107 6145 2659 0.47 0.59 0 1989 4476 6821 2937 8101 0640 6167 3825 0.60 0.73 0 1991 5020 7868 3203 783 8218 4073 5279 0.78 0.99 0 1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.9 6665 3541 6027 0.84 1.06 0 1993 4951 7606 3222 4.9 6665 3541 6027 0.84 1.06	1984	5053	7041	3626	11478	151 9	.675	3514		0.46	0.56	0.38
1987 3950 5349 2917 9862 283. 7578 2670 0.49 0.60 0 1988 3678 5046 2681 8126 107. 6145 2659 0.47 0.59 0 1989 4476 6821 2937 8101 0640 6167 3825 0.60 0.73 0.91 1990 5841 9504 3590 6982 85 5194 4282 0.73 0.91 0 1991 5846 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.59 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33.4 587 4780 2844 5867 0.82 1.03 <	1985	2457	3421	1765	11592	1485	9043	4749		0.50	0.61	0.41
1988 3678 5046 2681 8126 107 6145 2659 0.47 0.59 0 1989 4476 6821 2937 8101 0640 6167 3825 0.60 0.73 0 1990 5841 9504 3590 6982 885 5194 4282 0.73 0.91 0 1991 5020 7868 3203 785 8218 4073 5279 0.78 0.99 0 1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.79 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 37 887 4780 2844 5867 0.82 1.03 0 </td <td>1986</td> <td>3385</td> <td>4572</td> <td>2507</td> <td>11040</td> <td>14 15</td> <td>J635</td> <td>3730</td> <td></td> <td>0.48</td> <td>0.58</td> <td>0.39</td>	1986	3385	4572	2507	11040	14 15	J635	3730		0.48	0.58	0.39
1989 4476 6821 2937 8101 0640 6167 3825 0.60 0.73 0 1990 5841 9504 3590 6982 185 5194 4282 0.73 0.91 0 1991 5020 7868 3203 785 8218 4073 5279 0.78 0.99 0 1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.09 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33 587 4780 2844 5867 0.82 1.03 0 1996 3339 4622 12 3238 4142 2531 5118 0.75 0.91 0 <td>1987</td> <td>3950</td> <td>5349</td> <td>2917</td> <td>9862</td> <td>783.</td> <td>7578</td> <td>2670</td> <td></td> <td>0.49</td> <td>0.60</td> <td>0.40</td>	1987	3950	5349	2917	9862	783.	7578	2670		0.49	0.60	0.40
1990 5841 9504 3590 6982 385 5194 4282 0.73 0.91 0 1991 5020 7868 3203 783 8218 4073 5279 0.78 0.99 0 1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 459 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33.4 387 4780 2844 5867 0.82 1.03 0 1996 33339 4622 212 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 20-2 3573 4369 2922 4667 0.68 0.86 0	1988	3678	5046	2681	8126	107 5	6145	2659		0.47	0.59	0.38
1991 5020 7868 3203 778 8218 4073 5279 0.78 0.99 0 1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.59 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 32.4 587 4780 2844 5867 0.82 1.03 0 1996 3339 4622 212 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 20.4 3573 4369 2922 4667 0.68 0.86 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76	1989	4476	6821	2937	8101	9640	6167	3825		0.60	0.73	0.49
1992 4467 7011 2846 5400 7571 3852 6149 0.81 1.03 0 1993 4951 7606 3222 4.59 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33.4 1.387 4780 2844 5867 0.82 1.03 0 1996 3339 4622 2.12 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 20.4 3573 4369 2922 4667 0.68 0.86 0 1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76	1990	5841	9504	3590	6982	`85	5194	4282		0.73	0.91	0.58
1993 4951 7606 3222 4.50 6665 3541 6027 0.84 1.06 0 1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33 587 4780 2844 5867 0.82 1.03 0 1996 3339 4622 12 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 204 3573 4369 2922 4667 0.68 0.86 0 1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 361 4100 5229 3215 4696 0.63 0.79 0 <td>1991</td> <td>5020</td> <td>7868</td> <td>3203</td> <td>1/85</td> <td>8218</td> <td>4073</td> <td>5279</td> <td></td> <td>0.78</td> <td>0.99</td> <td>0.61</td>	1991	5020	7868	3203	1/85	8218	4073	5279		0.78	0.99	0.61
1994 3809 5822 2491 4064 5526 2988 6081 0.85 1.06 0 1995 4894 7078 33-7 587 4780 2844 5867 0.82 1.03 0 1996 3339 4622 2 12 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 20-3 3573 4369 2922 4667 0.68 0.86 0 1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 3861 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.7	1992	4467	7011	2846	5400	7571	3852	6149		0.81	1.03	0.64
1995 4894 7078 33 587 4780 2844 5867 0.82 1.03 0 1996 3339 4622 2 12 3238 4142 2531 5118 0.75 0.91 0 1997 2873 4033 20 3573 4369 2922 4667 0.68 0.86 0 1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 361 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 722 4219 3770 4604 3087 4922 0.76 0.97 <t< td=""><td>1993</td><td>4951</td><td>7606</td><td>3222</td><td>4 -0</td><td>6665</td><td>3541</td><td>6027</td><td></td><td>0.84</td><td>1.06</td><td>0.67</td></t<>	1993	4951	7606	3222	4 -0	6665	3541	6027		0.84	1.06	0.67
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1997 2873 4033 20-1 3573 4369 2922 4667 0.68 0.86 0 1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 361 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 722 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.35 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76	1995	4894	7078	3,7	587	4780	2844	5867		0.82	1.03	0.66
1998 4123 5959 2853 3814 4502 3230 3305 0.65 0.80 0 1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 361 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 722 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.35 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0	1996	3339	4622	2 12	3238	4142	2531	5118		0.75	0.91	0.61
1999 3487 5163 2355 3711 4751 2898 3764 0.61 0.76 0 2000 5632 8215 361 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 7422 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.35 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54	1997	2873	4033	204.	3573	4369	2922	4667		0.68	0.86	0.54
2000 5632 8215 861 4100 5229 3215 4696 0.63 0.79 0 2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 732 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.35 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 </td <td>1998</td> <td>4123</td> <td>5959</td> <td>2853</td> <td>3814</td> <td>4502</td> <td>3230</td> <td>3305</td> <td></td> <td>0.65</td> <td>0.80</td> <td>0.52</td>	1998	4123	5959	2853	3814	4502	3230	3305		0.65	0.80	0.52
2001 3581 5376 2386 3954 5004 3125 5654 0.70 0.87 0 2002 5781 7422 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.35 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0<	1999	3487	5163	2355	3711	4751	2898	3764		0.61	0.76	0.49
2002 5781 7 22 4219 3770 4604 3087 4922 0.76 0.97 0 2003 4877 6.15 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 £434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4.18 5381 3000 6125 7546 4971 3944 0.41 0.50 0<	2000	5632	8215	861	4100	5229	3215	4696		0.63	0.79	0.51
2003 4877 6.55 3646 3111 3711 2608 5029 0.71 0.85 0 2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4.18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0<	2001	3581		2386	3954	5004	3125	5654		0.70	0.87	0.56
2004 6255 275 4728 2931 3545 2424 4827 0.62 0.76 0 2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4 18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2002	5781	7 /22	4219	3770	4604	3087	4922		0.76	0.97	0.60
2005 4702 616 3585 3040 3723 2483 5560 0.56 0.68 0 2006 6434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 418 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2003	4877	6. 35	3646	3111	3711	2608	5029		0.71	0.85	0.58
2006 C434 3503 4868 3342 4165 2681 4267 0.43 0.54 0 2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4.18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2004	6255	275	4728	2931	3545	2424	4827		0.62	0.76	0.51
2007 53 7038 4067 4150 5124 3361 4026 0.40 0.50 0 2008 251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4.18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2005	4702	616	3585	3040	3723	2483	5560		0.56	0.68	0.45
2008 1251 4384 2411 5021 6210 4060 4350 0.37 0.46 0 2009 4.18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2006	£134	3503	4868	3342	4165	2681	4267		0.43	0.54	0.34
2009 4 18 5381 3000 6125 7546 4971 3944 0.43 0.53 0 2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2007	53-	/038	4067	4150	5124	3361	4026		0.40	0.50	0.32
2010 5556 7268 4248 5839 7419 4595 3424 0.41 0.50 0	2008	7 251	4384	2411	5021	6210	4060	4350		0.37	0.46	0.30
	2009	4. 18	5381	3000	6125	7546	4971	3944		0.43	0.53	0.35
2011 602 0507 5056 5512 7142 4255 2806 0.27 0.45 0	2010	5556	7268	4248	5839	7419	4595	3424		0.41	0.50	0.33
2011 300 300 3013 743 4233 3600 0.37 0.45 0	2011	6935	9507	5056	5513	7143	4255	3806		0.37	0.45	0.29
2012 4148 5534 3110 6060 7770 4726 4020 0.35 0.43 0	2012	4148	5534	3110	6060	7770	4726	4020		0.35	0.43	0.28
2013 3166 4208 2382 7043 8883 5584 2982 97 0.33 0.41 0	2013	3166	4208	2382	7043	8883	5584	2982	97	0.33	0.41	0.27
2014 6363 8366 4839 8224 10395 6507 2834 159 0.33 0.41 0	2014	6363	8366	4839	8224	10395	6507	2834	159	0.33	0.41	0.27
2015 8792 11868 6514 8008 10476 6121 2925 112 0.33 0.41 0	2015	8792	11868	6514	8008	10476	6121	2925	112	0.33	0.41	0.27
2016 3048 4189 2218 8233 10793 6281 3493 666 0.36 0.45 0	2016	3048	4189	2218	8233	10793	6281	3493	666	0.36	0.45	0.29

^{** &}quot;Other" includes Sweden and, in early years, Ireland and the Faroe Islands.

[^] Preliminary.

^{^^} Including BMS landings.

	Recruitment			SSB			Landings	Discards	F	(per year	-)
Year	Age 1	High	Low	SSB	High	Low	Landings	Discarus	Ages	∐igh	Low
		thousands			tonnes		ton	nes	2–6	High	Low
2017	5140	7607	3473	9184	11670	7227	3441	496	0.35	0.44	0.28
2018	5763	10010	3318	9210	11850	7158	3140	486	0.36	0.46	0.28
2019	4492			8523							

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