

## Sea bass (*Dicentrarchus labrax*) in divisions 4.b–c, 7.a, and 7.d–h (central and southern North Sea, Irish Sea, English Channel, Bristol Channel, and Celtic Sea)

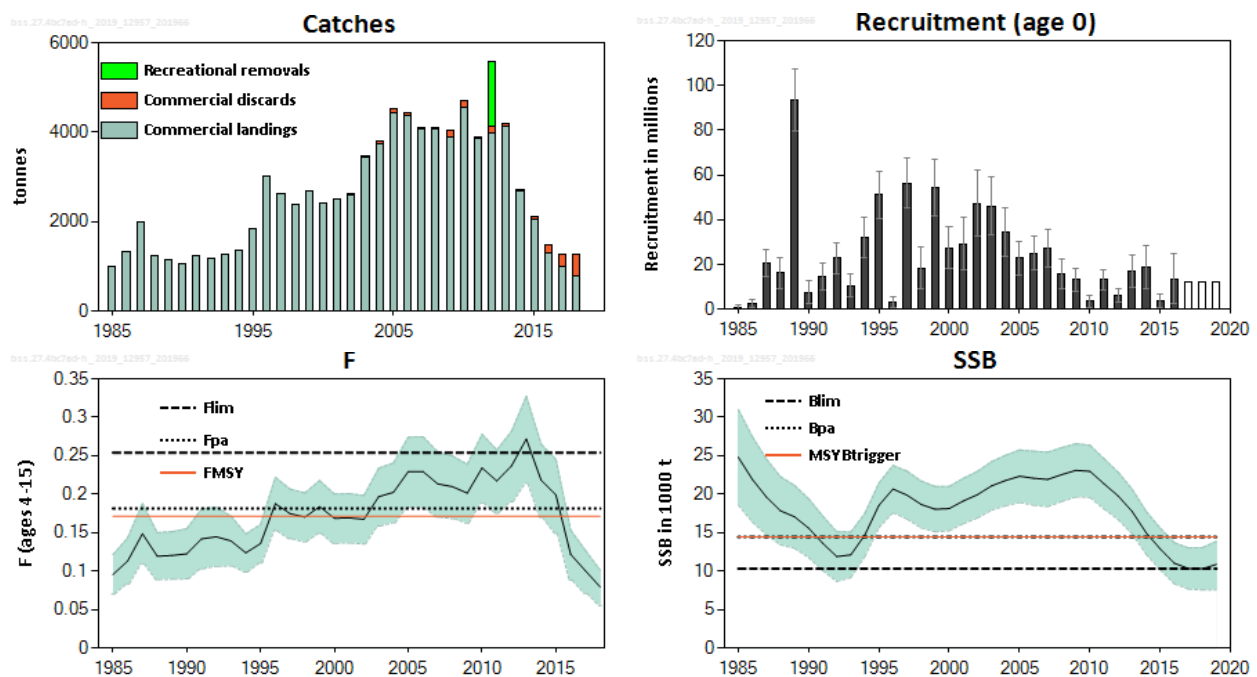
### ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, total removals<sup>†</sup> in 2019 should be no more than 1806 tonnes. This advice for 2019 replaces the advice provided in July 2018<sup>‡</sup>.

ICES advises that when the EU multiannual plan (MAP) for Western Waters and adjacent waters is applied, total removals in 2020 that correspond to the F ranges in the MAP are between 1634 tonnes and 1946 tonnes.

### Stock development over time

Spawning-stock biomass (SSB) has been declining since 2009 and is currently below MSY  $B_{trigger}$  and just above  $B_{lim}$ . Fishing mortality (F) has increased over the time-series, peaking in 2013 before a rapid decline to below  $F_{MSY}$ . After a period of above average recruitment (R), recruitment is low, fluctuating without trend since 2008.



**Figure 1** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Summary of the stock assessment. Total landings (commercial landings and estimated recreational removals, available for 2012 only [green bar], taking mortality of released fish into account). Fishing mortality is shown for the combined commercial and recreational fisheries. Discard estimates are available from 2009. Assumed recruitment values are not shaded. Recruitment, F, and SSB are shown with 95% confidence intervals.

### Stock and exploitation status

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

<sup>†</sup> Includes commercial catch and recreational removals (taking mortality of released fish into account, estimated at approximately 5%).  
<sup>‡</sup> This advice is provided because of an error that was discovered in the advice for 2019 provided in July 2018. The advice for total catches is practically unchanged. See the Quality of the assessment for details.

**Table 1** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size			
		2016	2017	2018	2017	2018	2019	
Maximum sustainable yield	$F_{MSY}$	✓	✓	✓ Below	$MSY B_{trigger}$	✗	✗	✗ Below trigger
Precautionary approach	$F_{pa}, F_{lim}$	✓	✓	✓ Harvested sustainably	$B_{pa}, B_{lim}$	○	○	○ Increased risk
Management plan	$F_{MGT}$	✓	✓	✓ Below	$B_{MGT}$	✗	✗	✗ Below trigger

### Catch scenarios for 2019

**Table 2** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Assumptions made for the interim year and 2019 forecast.

Variable	Value	Notes
$F_{ages\ 4-15}$ (2018)	0.078	Model output (2019 assessment using data up to 2018).
SSB (2019)	10884	Model output; in tonnes.
$R_{age\ 0}$ (2017–2019)	12383	Geometric mean (2005–2016); in thousands.
Total catch (2018)	1467	Total landings + discards + recreational removals; in tonnes.
Total landings (2018)	801	ICES landings; in tonnes.
Discards (2018)	482	ICES discards; in tonnes.
Recreational removals (2018)	156	Model output; in tonnes.

**Table 3** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Annual catch scenarios for 2019. All weights are in tonnes.

Basis	Total catch* (2019)	Commercial landings (2019)	Commercial discards (2019)	Recreational removals (2019)	Total F (2019)	F Commercial landings (2019)	F Commercial discards (2019)	F Recreational removals (2019)	SSB (2020)	% SSB change **	% Advice change ***
ICES advice basis											
MSY approach = $F_{MSY} \times SSB_{2019} / MSY B_{trigger}$	1806	1480	118	207	0.129	0.110	0.0041	0.015	10960	0.70	105
Other scenarios											
$F = F_{MSY}$	2341	1918	154	269	0.171	0.145	0.0054	0.020	10527	-3.3	166
$F = 0$	0	0	0	0	0	0	0	0	12432	14.2	-100
$F_{pa}$	2488	2038	164	286	0.182	0.155	0.0057	0.022	10408	-4.4	183
$F_{lim}$	3350	2741	224	385	0.25	0.216	0.0080	0.030	9717	-10.7	281
$SSB_{2020} = B_{lim}$	2606	2135	172	299	0.192	0.163	0.0060	0.023	10313	-5.2	196
$SSB_{2020} = B_{pa}^{\wedge}$											
$SSB_{2020} = MSY B_{trigger}^{\wedge}$											
$F = F_{2018}$	1121	919	73	129	0.078	0.067	0.0025	0.0093	11516	5.8	27

\* Includes commercial catch and recreational removals (taking mortality of released fish into account, estimated at approximately 5%).

\*\* SSB 2020 relative to SSB 2019.

\*\*\* Advice value for 2019 relative to the advice value for 2018 (880 tonnes).

$\wedge$  The  $B_{pa}$  and  $MSY B_{trigger}$  options were left blank because  $B_{pa}$  and  $MSY B_{trigger}$  cannot be achieved in 2020, even with zero catch in 2019.

While the assessment has been revised and reference points have been updated, the increase of 105% in catch advice for 2019 compared with the advice for 2018 is mainly due to the above-average recruitment in 2013 and 2014, low fishing mortality, and increase in stock size.

**Catch scenarios for 2020**

**Table 4** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Assumptions made for the interim year and 2019 forecast.

Variable	Value	Notes
$F_{\text{ages 4-15}}$ (2019)	0.088	Total $F$ , $F_{\text{sq}}$ = (average $F$ 2016–2018) for commercial fishery plus assuming full compliance of recreational fisheries in 2019.
SSB (2020)	11413	Short-term forecast; in tonnes.
$R_{\text{age 0}}$ (2017–2020)	12383	Geometric mean (2005–2016); in thousands.
Total catch (2019)	1248	Short-term forecast; in tonnes.
Total landings (2019)	915*	Short-term forecast (average landings pattern over the last 3 years [2016–2018]); in tonnes.
Discards (2019)	73*	Short-term forecast (average discards pattern over the last 3 years [2016–2018]); in tonnes.
Recreational removals (2019)	260	Short-term forecast assuming an $F = 0.019^{**}$ (average recreational removals pattern over the last 3 years [2016–2018], assuming full compliance); in tonnes.

\* The split of total commercial  $F$  into commercial landings and commercial discards in the interim year is modelled.

\*\* Recreational  $F$  as estimated in 2012 (0.06), reduced by 69% to account for the management measures in place in 2019.

**Table 5** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Annual catch scenarios for 2020. All weights are in tonnes.

Basis	Total catch* (2020)	Commercial landings (2020)	Commercial discards (2020)	Recreational removals (2020)	Total F (2020)	F Commercial landings (2020)	F Commercial discards (2020)	F Recreational removals (2020)	SSB (2021)	% SSB change **	% Advice change ***
ICES advice basis											
EU MAP#: $F_{\text{MSY}} \times \text{SSB}_{2020} / \text{MSY } B_{\text{trigger}}$	1946	1445	89	412	0.135	0.102	0.0038	0.029	10861	-4.8	7.8
F = MAP $F_{\text{MSY lower}} \times \text{SSB}_{2020} / \text{MSY } B_{\text{trigger}}$	1634	1213	74	346	0.112	0.085	0.0031	0.024	11114	-2.6	-9.5
Other scenarios											
MSY approach = $F_{\text{MSY}} \times \text{SSB}_{2020} / \text{MSY } B_{\text{trigger}}$	1946	1445	89	412	0.135	0.102	0.0038	0.029	10861	-4.8	7.8
$F = F_{\text{MSY}}$	2428	1802	111	514	0.171	0.130	0.0048	0.037	10473	-8.2	34
$F = 0$	0	0	0	0	0	0	0	0	12444	9.0	-100
$F_{\text{pa}}$	2560	1900	118	543	0.182	0.138	0.0051	0.039	10367	-9.2	42
$F_{\text{lim}}$	3462	2567	161	734	0.254	0.192	0.0071	0.054	9644	-15.5	92
$\text{SSB}_{2021} = B_{\text{lim}}$	2627	1949	121	557	0.187	0.141	0.0052	0.040	10313	-9.6	45
$\text{SSB}_{2021} = B_{\text{pa}}^{\wedge}$											
$\text{SSB}_{2021} = \text{MSY } B_{\text{trigger}}^{\wedge}$											
$F = F_{2019}$	1296	963	59	275	0.088	0.067	0.0025	0.019	11388	-0.22	-28

\* Includes commercial catch and recreational removals (taking mortality of released fish into account, estimated at approximately 5%).

\*\* SSB 2021 relative to SSB 2020.

\*\*\* Advice value for 2020 relative to the advice value for 2019 (1806 tonnes).

$\wedge$  The  $B_{\text{pa}}$  and  $\text{MSY } B_{\text{trigger}}$  options were left blank because  $B_{\text{pa}}$  and  $\text{MSY } B_{\text{trigger}}$  cannot be achieved in 2021, even with zero catch in 2020.

# MAP multiannual plan (EU, 2019).

The increase in advice for 2020 of 7.8% is mainly due to above-average recruitment in 2013 and 2014.

**Basis of the advice**

**Table 6** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. The basis of the advice.

Advice basis for 2020	Management plan
Management plan	<p>The EU multiannual plan (MAP) for stocks in in the Western Waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities, depending on stock status and making use of the <math>F_{MSY}</math> range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to <math>F_{MSY}</math> can only be taken providing SSB is greater than <math>MSY B_{trigger}</math>, and one of the following conditions is met:</p> <ul style="list-style-type: none"> <li>a) if it is necessary for the achievement of objectives of mixed fisheries;</li> <li>b) if is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics;</li> <li>c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%.</li> </ul> <p>ICES considers that the <math>F_{MSY}</math> range used in the MAP for this stock is precautionary.</p> <p>Full details of the plan are described in EU (2019).</p>

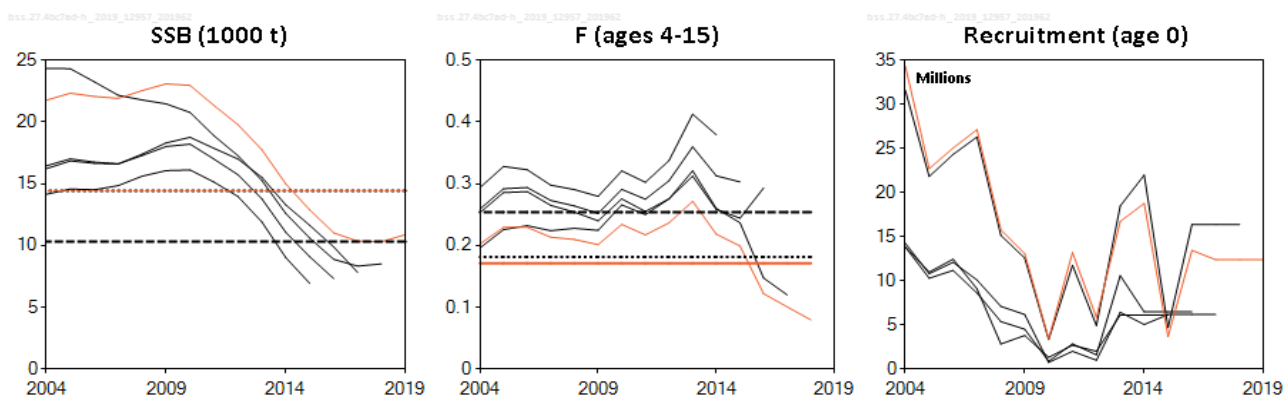
**Quality of the assessment**

An error was found in the computation of the early part of the LPUE series, used in the advice provided in July 2018 regarding fishing opportunities for 2019. The correction of this error implied also a revision in the estimation of recreational catches for the entire time-series. These are based on the fishing mortality for recreational fisheries in 2012 when the estimate of recreational catch was available. These changes are mostly the cause of the downward revision in SSB at the beginning of the series, as well as the upward revision of SSB and the downward revision in F in recent years. Reference points have been updated accordingly.

Poor catch data quality, owing to limited sampling of the discards and recreational removals, leads to additional uncertainty in the assessment. The discard values are estimated from sampling programmes, and more recently from a mix of sampling programmes and logbooks, where sampling is variable across fleets and years. Despite an increase in the reported discard values in the logbooks since 2016 for some countries, total discards are still considered to be considerably underestimated. For the forecast, the discard ratio assumed is the estimate provided by the assessment model. This assumed discard rate is lower than the discard rates recently observed. This has little impact on the values of the advised total catch.

The estimates of 1440 tonnes for the recreational removals (including post-release mortality, estimated to be 5%) in 2012, are based on multiple surveys covering a range of years. As in previous years, the mortality rate from recreational removals for 1985–2014 (excluding 2012) was assumed to be the same as estimated for 2012. In the assessment, the mortality rate from recreational removals for 2015 to 2018 was derived by scaling down the 2012 F to account for the management measures in these years, assuming full compliance.

Fishery sampling rates over time have been variable for all countries. For France, no data on commercial numbers-at-length and age are available prior to 2000, increasing the uncertainty in this time period. Additional information on recreational removals from all countries is needed in order to improve these estimates and the stock assessment model.



**Figure 2** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Historical assessment results. F in the current assessment (red line) refers to ages 4–15; in all other assessments (black lines) it refers to ages 5–11. The stock was benchmarked in 2016, 2017, and 2018.

### Issues relevant for the advice

Following a correction of the error in the calculation of the LPUE series used in the previous assessment, ICES is now providing revised advice for 2019 based on the current assessment. The result of this correction is that the advice for total catches for 2019 is increased slightly compared to that provided in 2018 and there is a difference in the predicted proportions of commercial and recreational catches. For example, the predicted recreational catches for 2019 are estimated to be 207 t in the corrected advice compared to 113 t in the initial advice provided in 2018 for 2019.

In the absence of information on future management measures, the forecast assumes the same relative fishing mortality ratios as those indicated in the interim year of the forecast for the commercial and recreational fleet components. Using different ratios for the fleet components can give different resulting catches.

The emergency measures introduced in 2015 reduced not only pelagic trawl catches of sea bass, but also bycatch of sea bass in other fisheries. However, observed discards have increased.

Stock identity remains poorly understood.

### Reference points

**Table 7** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	14439	$B_{pa}$ ; in tonnes.	ICES (2019)
	$F_{MSY}$	0.1713	Stochastic simulations (EqSim).	ICES (2019)
Precautionary approach	$B_{lim}$	10313	$B_{loss}$ (lowest value in the time-series, SSB in 2018 as estimated by the WGCSE 2019 assessment); in tonnes.	ICES (2019)
	$B_{pa}$	14439	$B_{lim} \times 1.4$ ; in tonnes.	ICES (2019)
	$F_{lim}$	0.254	Stochastic simulations (EqSim).	ICES (2019)
	$F_{pa}$	0.1815	$F_{lim} / 1.4$	ICES (2019)
Management plan*	MAP MSY $B_{trigger}$	14439	MSY $B_{trigger}$ ; in tonnes.	EU (2019)
	MAP $B_{lim}$	10313	$B_{lim}$ ; in tonnes.	EU (2019)
	MAP $F_{MSY}$	0.1713	$F_{MSY}$	EU (2019)
	MAP range $F_{lower}$	0.142	Consistent with ranges provided by ICES (2019), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2019) and EU (2019)
	MAP range $F_{upper}$	0.1713	Consistent with ranges provided by ICES (2019), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2019) and EU (2019)

\* EU multiannual plan (MAP) for the Western Waters and adjacent waters (EU, 2019).

## Basis of the assessment

**Table 8** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018a).
Assessment type	Age- and length-based analytical assessment (Stock Synthesis 3; NOAA Toolbox).
Input data	Commercial landings (international landings, ages and length frequencies from catch sampling); commercial discards (UK bottom otter trawl and nets and combined French fleet, length frequencies from catch sampling); one recruit survey (UK Solent autumn survey, 1986 to present, excluding 2010 and 2012); one bottom trawl survey (Channel Groundfish Survey, 1988–2014); one commercial tuning fleet (2001 to present); growth and maturity data from sampling of commercial catches and surveys; natural mortality (inferred from life history parameters and maximum observed ages).
Discards and bycatch	Discarding included in the model and forecast for some of the fleets.
Recreational	Used in the model and in the forecast.
Indicators	None.
Other information	Benchmarked in 2018 (ICES, 2018b).
Working group	Working Group for the Celtic Seas Ecoregion ( <a href="#">WGCSE</a> )

## Information from stakeholders

There is no additional available information.

## History of the advice, catch, and management

**Table 9** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. History of ICES advice, the agreed TAC and ICES estimates of landings, discards, and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice*	Agreed TAC	Official commercial landings	ICES commercial landings	ICES commercial discards <sup>^</sup>	ICES recreational removals
2000	-	-	none	2100	2407		
2001	-	-	none	2200	2500		
2002	No increase in effort or F	-	none	2400	2622		
2003	No increase in effort or F	-	none	2900	3459		
2004	No increase in effort or F	-	none	3000	3731		
2005	-	-	none	3200	4430		
2006	-	-	none	3373	4377		
2007	-	-	none	3520	4064		
2008	-	-	none	3008	4107		
2009	-	-	none	4273	3889	151	
2010	-	-	none	4953	4562	148	
2011	-	-	none	4184	3858	22	
2012	No increase in catch	-	none	3983	3987	157	1440
2013	20% reduction in catches (last 3 years' average)	< 6000**	none	4242	4137	53	
2014	36% reduction in commercial landings (20% reduction, followed by 20% precautionary reduction)	< 2707**	none	2817	2682	25	

Year	ICES advice	Catch corresponding to advice*	Agreed TAC	Official commercial landings	ICES commercial landings	ICES commercial discards <sup>^</sup>	ICES recreational removals
2015	MSY approach	< 1155***	none	2081	2066	40	
2016	MSY approach	≤ 541***	none	1290	1295	199##	
2017	Precautionary approach	0	none	949^^	984	271##	
2018	MSY approach	≤ 880^^^	none	912^^	801^^	482^^	
2019	MSY approach	≤ 1806^^^	none				
2020	Management plan <sup>#</sup>	1634–1946^^^					

\* Advice prior to 2014 was given for sea bass in the Northeast Atlantic.

\*\* Commercial landings.

\*\*\* Total landings (commercial and recreational landings).

<sup>^</sup> Incomplete for some fleets.

<sup>^^</sup> Preliminary.

<sup>^^^</sup> Includes commercial catch and recreational removals (taking mortality of released fish into account, estimated at approximately 5%).

<sup>#</sup> EU multiannual plan (MAP) for the Western Waters and adjacent waters (EU, 2019).

<sup>##</sup> Updated in 2019.

### History of the catch and landings

**Table 10** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Catch distribution by fleet in 2018 as estimated by ICES.

Total catch	Commercial landings						Commercial discards	Recreational removals
	Lines	Bottom trawlers	Other gears	Fixed/drift nets	Danish seine	Pelagic trawlers		
1439 tonnes	52%	14%	4%	26%	3%	1%	482 tonnes	156 tonnes
801 tonnes								

**Table 11** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. History of commercial landings by country. All weights are in tonnes.

Year	Belgium	Denmark	Germany	France	UK	Netherlands	Channel Is.	Total	Total ICES
1985	0	0	0	620	105	0	18	743	994
1986	0	0	0	841	124	0	15	980	1319
1987	0	0	0	1226	123	0	14	1363	1980
1988	0	18	0	714	173	8	12	925	1239
1989	0	2	0	675	192	2	48	919	1161
1990	0	0	0	609	189	0	25	824	1063
1991	0	0	0	726	239	0	16	982	1227
1992	0	0	0	721	148	0	36	906	1186
1993	0	1	0	718	230	0	45	994	1255
1994	0	1	0	593	535	0	49	1178	1371
1995	0	1	0	801	708	0	69	1579	1835
1996	0	1	0	1703	563	8	56	2331	3022
1997	0	1	0	1429	561	1	74	2066	2620
1998	0	2	0	1363	488	48	79	1980	2390
1999	0	1	0	NA	685	32	108	826	2670
2000	0	5	0	1522	407	60	130	2124	2407
2001	0	2	0	1619	458	77	80	2236	2500
2002	0	1	0	1580	627	96	73	2377	2622
2003	154	1	0	1903	586	163	84	2891	3459
2004	159	1	0	1883	617	191	159	3010	3731
2005	206	1	0	1937	512	327	220	3203	4430
2006	211	2	0	2116	736	308	23	3396	4377
2007	178	1	0	2075	873	376	18	3521	4064
2008	187	0	0	1506	934	380	20	3027	4107
2009	174	0	0	2904	801	395	15	4288	3889
2010	216	4	0	3441	879	399	14	4952	4562
2011	152	2	0	2688	928	395	17	4183	3858
2012	154	3	0	2492	946	376	12	3982	3987

Year	Belgium	Denmark	Germany	France	UK	Netherlands	Channel Is.	Total	Total ICES
2013	146	4	2	2868	841	370	12	4243	4137
2014	148	1	1	1322	1080	253	11	2816	2682
2015	40	0	0	1113	701	218	9	2081	2066
2016	23	0	1	545	567	156	7	1300	1295
2017*	22	0		423	437	57	11	949	984
2018*	18	0	0	297	431	165	0	912	801

\* Preliminary.

## Summary of the assessment

**Table 12** Sea bass in divisions 4.b–c, 7.a, and 7.d–h. Assessment summary. Weights are in tonnes and recruitment in thousands. High and low refers to 95% confidence intervals.

Year	Recruitment age 0			SSB			F ages 4–15			Commercial landings	Commercial discards*	Recreational removal**
	Low	Value	High	Low	Value	High	Low	Value	High			
1985	74	862	1649	18600	24810	31019	0.070	0.096	0.122	994		1713
1986	433	2469	4506	16390	21938	27485	0.083	0.113	0.143	1318		1550
1987	14534	20458	26382	14719	19651	24584	0.110	0.149	0.188	1979		1412
1988	9114	16119	23124	13426	17849	22272	0.089	0.119	0.150	1239		1305
1989	79578	93569	107559	12979	17065	21150	0.090	0.120	0.151	1161		1204
1990	2215	7374	12533	11764	15593	19422	0.090	0.122	0.155	1064		1082
1991	8602	14562	20522	10088	13634	17179	0.103	0.142	0.181	1226		988
1992	15797	22786	29774	8665	11894	15123	0.106	0.145	0.183	1186		998
1993	5453	10557	15661	9160	12117	15075	0.107	0.139	0.171	1256		1150
1994	22843	32088	41332	11898	14699	17500	0.099	0.124	0.148	1370		1378
1995	40622	51030	61438	15668	18556	21444	0.111	0.136	0.161	1835		1551
1996	432	2914	5397	17597	20666	23735	0.153	0.188	0.22	3022		1570
1997	45059	56168	67277	16778	19884	22991	0.142	0.175	0.21	2620		1496
1998	8994	18334	27674	15627	18670	21713	0.138	0.170	0.20	2390		1448
1999	41905	54392	66880	15107	18052	20997	0.149	0.184	0.22	2670		1449
2000	17955	27423	36891	15250	18133	21016	0.136	0.169	0.20	2407		1496
2001	17253	29225	41198	16176	19119	22062	0.137	0.169	0.20	2500		1572
2002	32494	47319	62144	16904	19937	22970	0.135	0.167	0.198	2622	17	1655
2003	33020	45959	58899	17922	21075	24227	0.159	0.197	0.23	3459	16	1727
2004	23697	34346	44995	18495	21776	25056	0.163	0.20	0.24	3731	59	1771
2005	14954	22710	30466	18937	22343	25749	0.183	0.23	0.27	4430	96	1782
2006	17519	25061	32603	18571	22078	25586	0.182	0.23	0.27	4377	53	1777
2007	18588	27150	35712	18395	21925	25455	0.170	0.21	0.25	4064	50	1798
2008	8968	15775	22582	19057	22552	26048	0.168	0.21	0.25	4107	8	1824
2009	8083	13076	18068	19649	23102	26555	0.163	0.20	0.24	3889	151.2	1812
2010	549	3423	6296	19583	22973	26363	0.189	0.23	0.28	4562	147.9	1726
2011	8739	13192	17646	18095	21351	24607	0.175	0.22	0.26	3858	22	1592
2012	2787	5831	8876	16716	19794	22871	0.190	0.24	0.28	3987	156.6	1440
2013	9586	16744	23902	14851	17758	20665	0.21	0.27	0.33	4137	53.4	1241
2014	9215	18780	28344	12200	14982	17763	0.170	0.22	0.27	2682	24.7	1048
2015	854	3661	6468	10174	12885	15595	0.149	0.199	0.25	2066	39.5	737
2016	2298	13452	24605	8360	11025	13689	0.088	0.122	0.153	1295	198.6	228
2017		12383^		7685	10353	13020	0.071	0.101	0.127	984	271.102	223
2018		12383^		7559	10313	13068	0.055	0.079	0.101	801	482.4	156
2019		12383^		7559	10884	13884						

\* Incomplete for some fleets.

\*\* Estimated.

^ Geometric mean recruitment (2005–2016).



## Sources and references

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