

## 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

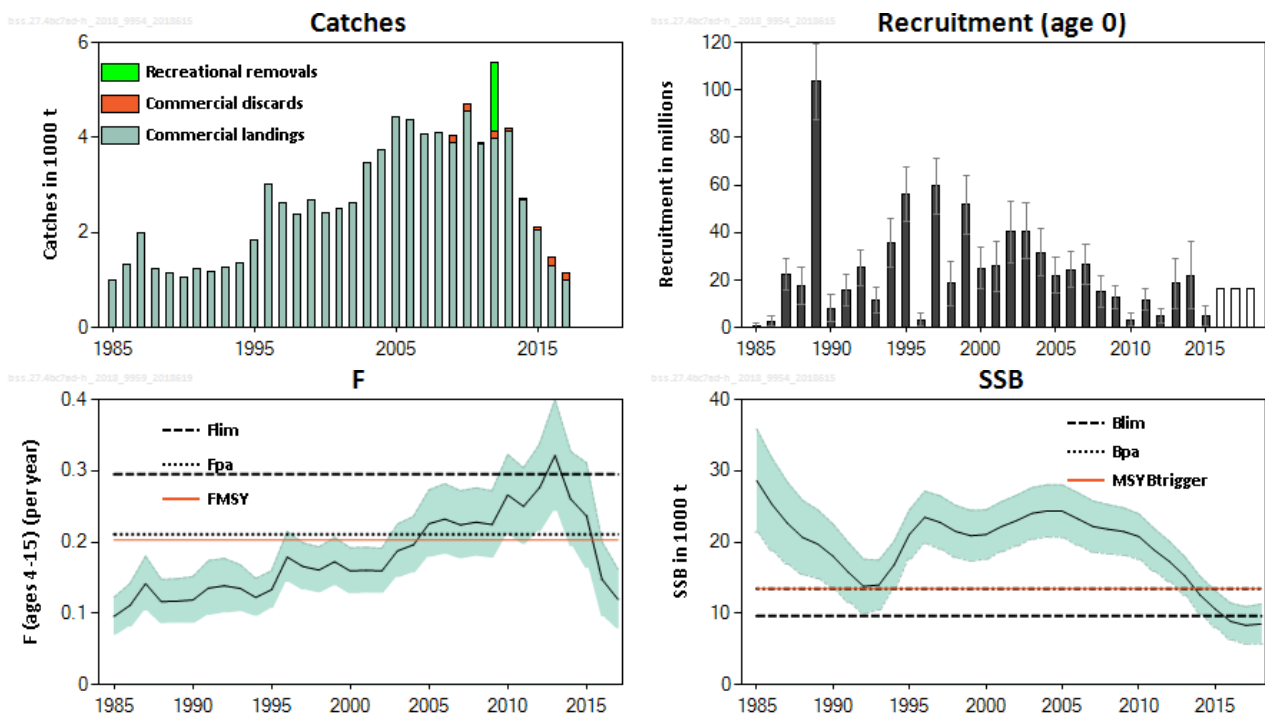
ICES advises that when the MSY approach is applied, total removals<sup>1</sup> in 2018 should be no more than 880 tonnes.

This advice for 2018 replaces the advice provided in July 2017.

ICES advises that when the MSY approach is applied, total removals<sup>1</sup> in 2019 should be no more than 1789 tonnes.

### Stock development over time

Spawning-stock biomass (SSB) has been declining since 2005 and is now below  $B_{lim}$ . Fishing mortality (F) has increased over the time-series, peaking in 2013 before a rapid decline to below  $F_{MSY}$ . Recruitment was estimated to be poor since 2008, with the exception of the 2013 and 2014 year-class estimates which show average recruitment.



**Figure 1** Seabass 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, taking mortality of released fish into account). Fishing mortality is shown for the combined commercial and recreational fisheries. Discard estimates are available since 2009. Predicted recruitment values are not shaded. Recruitment, F, and SSB are shown with 95% confidence intervals.

<sup>1</sup> Includes commercial catch and recreational removals (taking mortality of released fish into account, estimated at approximately 5%).

### Stock and exploitation status

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

**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		
		2015	2016	2017	2016	2017	2018
Maximum sustainable yield	$F_{MSY}$	✘	✔	✔ Below	$MSY B_{trigger}$	✘	✘ Below trigger
Precautionary approach	$F_{pa}, F_{lim}$	⦿	✔	✔ Harvested sustainably	$B_{pa}, B_{lim}$	✘	✘ Reduced reproductive capacity
Management plan	$F_{MGT}$	—	—	— Not applicable	$B_{MGT}$	—	— Not applicable

### Revision of the catch scenarios for 2018

**Table 2** Sea bass in divisions 4.b-c, 7.a, and 7.d-h. The basis for the revised catch options for 2018.

Variable	Value	Notes
$F_{ages\ 4-15}$ (2017)	0.120	Model output (2018 assessment using data up to 2017).
SSB (2018)	8513 tonnes	Model output.
$R_{age\ 0}$ (2016-2017)	16393 thousands	Geometric mean (1985-2015).
Total catch (2017)	1362 tonnes	Total landings + discards + recreational removals.
Total landings (2017)	984 tonnes	ICES landings.
Discards (2017)	162 tonnes	ICES discards.
Recreational removals (2017)	216 tonnes	Model output assuming an $F = 0.020^*$ .

\* Recreational F as estimated in 2012 (0.07), reduced by 72% to account for the management measures in place in 2017.

**Table 3** Sea bass in divisions 4.b-c, 7.a, and 7.d-h. Annual catch scenarios for 2018. All weights are in tonnes.

Basis	Total catch* (2018)	Commercial landings (2018)	Commercial discards (2018)	Recreational removals (2018)	Total F^^ (2018)	F Commercial landings^^ (2018)	F Commercial discards (2018)	F Recreational removals^^ (2018)	SSB (2019)	% SSB change **	% Advice change ***
ICES advice basis											
MSY approach: SSB <sub>2019</sub> = B <sub>lim</sub>	880	662	73	145	0.075	0.06	0.0020	0.0124	9618	13.0	-
Other scenarios											
F = 0	0	0	0	0	0	0	0	0	10300	21	-
F = F <sub>MSY</sub> × SSB <sub>2018</sub> / MSY B <sub>trigger</sub>	1474	1108	123	243	0.128	0.104	0.0034	0.021	9162	7.6	-
F = F <sub>MSY lower</sub> × SSB <sub>2018</sub> / MSY B <sub>trigger</sub>	1041	783	86	172	0.089	0.072	0.0024	0.0148	9494	11.5	-
F = F <sub>MSY upper</sub> × SSB <sub>2018</sub> / MSY B <sub>trigger</sub>	1474	1108	123	243	0.128	0.104	0.0034	0.021	9162	7.6	-
F <sub>pa</sub>	2337	1753	199	385	0.211	0.170	0.0056	0.035	8504	-0.104	-
F <sub>lim</sub>	3153	2361	273	520	0.30	0.24	0.0078	0.049	7890	-7.3	-
SSB (2019) = B <sub>pa</sub> <sup>^</sup>											
SSB (2019) = MSY B <sub>trigger</sub> <sup>^</sup>											
F = F <sub>2017</sub>	1381	1038	115	228	0.120	0.097	0.0032	0.020	9233	8.5	-

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

\*\* SSB 2019 relative to SSB 2018 (8513 tonnes).

\*\*\* Advice value 2018 relative to advice value 2017. This is not provided as the advice in 2017 was zero.

<sup>^</sup> The B<sub>pa</sub> and MSY B<sub>trigger</sub> options were left blank because B<sub>pa</sub> and MSY B<sub>trigger</sub> cannot be achieved in 2019, even with zero catch in 2018.

<sup>^^</sup> The split of total F into commercial landings, commercial discards, and recreational removals in the short-term forecast is based on the proportion observed in 2017.

The assessment includes discard estimates and natural mortality of 0.24, higher than that previously assumed. Although the perception of the stock, historically, has changed with the new benchmarked assessment, the current status of the stock remains unchanged (below B<sub>lim</sub>). However, given the strong downwards revision in recent F, the estimated F for 2017 is lower than the one assumed last year (F<sub>2017</sub> = F<sub>2016</sub>). Given that the above-average recruitment in 2013–2014 contributes to the SSB in 2018, it is possible to reach B<sub>lim</sub> in 2019 with a non-zero catch in 2018.

### Catch scenarios for 2019

**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 <sub>ages 4-15</sub> (2018)	0.107	F <sub>sq</sub> for Commercial fishery and assuming full compliance of recreational fisheries.
SSB (2019)	9340 tonnes	Short-term forecast.
R <sub>age 0</sub> (2016–2018)	16393 thousands	Geometric mean (1985–2015).
Total catch (2018)	1240 tonnes	Short-term forecast.
Total landings (2018)	1045 tonnes**	Short-term forecast (average landings pattern over the last 3 years [2015–2017]).
Discards (2018)	116 tonnes**	Short-term forecast (average discards pattern over the last 3 years [2015–2017]).
Recreational removals (2018)	80 tonnes	Short-term forecast (average recreational removals pattern over the last 3 years [2015–2017], assuming full compliance).

\* Mortality of released fish only.

\*\* The split of total F into commercial landings and commercial discards in the interim year is based on the proportion observed in 2017.

**Table 5** 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											
<i>MSY approach:</i> $F_{MSY} \times SSB_{2019} / MSY B_{trigger}$	1789	1532	144	113	0.141	0.127	0.0042	0.0092	9973	6.8	103
Other scenarios											
F = 0	0	0	0	0	0	0	0	0	11378	22	-100
$F = F_{MSY\ lower} \times SSB_{2019} / MSY B_{trigger}$	1267	1085	101	80	0.098	0.089	0.0029	0.0064	10381	11.2	44
$F = F_{MSY\ upper} \times SSB_{2019} / MSY B_{trigger}$	1789	1532	144	113	0.141	0.127	0.0042	0.0092	9973	6.8	103
F <sub>pa</sub>	2600	2223	212	165	0.211	0.191	0.0062	0.0138	9344	0.040	195
F <sub>lim</sub>	3505	2993	290	222	0.295	0.267	0.0087	0.0192	8646	-7.4	300
SSB <sub>2020</sub> = B <sub>lim</sub>	2245	1921	182	142	0.180	0.163	0.0053	0.0117	9618	3.0	155
SSB <sub>2020</sub> = B <sub>pa</sub> <sup>^</sup>											
SSB <sub>2020</sub> = MSY B <sub>trigger</sub> <sup>^</sup>											
F = F <sub>2018</sub>	1379	1181	111	87	0.107	0.097	0.0032	0.0070	10293	10.2	57

\* 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 advice value for 2018 (880 tonnes).

<sup>^</sup> The B<sub>pa</sub> and MSY B<sub>trigger</sub> options were left blank because B<sub>pa</sub> and MSY B<sub>trigger</sub> cannot be achieved in 2020, even with zero catch in 2019.

<sup>^^</sup> The split of total F into commercial landings, commercial discards, and recreational removals in the short-term forecast is based on the proportion observed in 2017.

The above-average recruitment in 2013 and 2014, low fishing mortality, and increasing stock size results in the 103% increase in advised catch for 2019.

### 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 2018	MSY approach
Advice basis 2019	MSY approach
Management plan	The EU has proposed a multiannual management plan for the Western Waters, which is not yet finalized (EU, 2018).

### Quality of the assessment

This stock was benchmarked in 2018 (ICES, 2018a); a new tuning series was added, the assumption on natural mortality was revised, the assumption for recreational removals was revised, and discard data were added. Therefore, the present assessment is not fully comparable with the previous year's assessment.

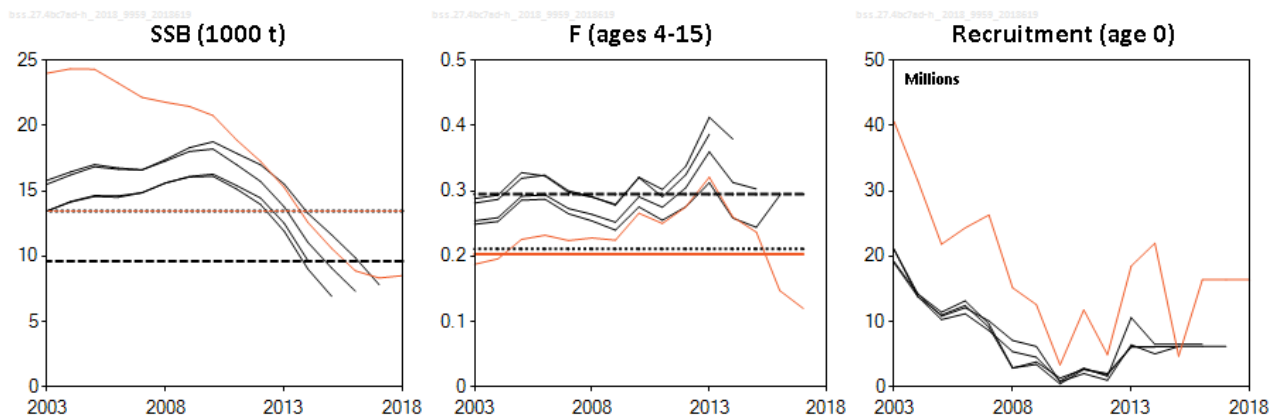
Poor catch data quality, owing to limited sampling of the discards and recreational removals, leads to additional uncertainty in the assessment. The discard values are estimated from sampling programmes where sampling is variable across fleets and years. Anecdotal information suggests that total discards could be considerably underestimated.

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, within the assessment, assumed to be the same as estimated for 2012. In

this year's assessment, the mortality rate from recreational removals for 2015 to 2017 was derived by scaling down the 2012 F to account for the management measures in these years, assuming full compliance. This resulted in a significant revision of the estimate for recreational removals for 2016, from 1627 to 212 tonnes, compared to last year's assessment/assumption.

Fishery sampling rates over time have been variable for all countries. For France, there are no commercial numbers-at-length and age prior to 2000, increasing the uncertainty in this time period.

Owing to a lack of French market sampling of length in Q1 and Q2 of 2017 (biological and on-board sampling was unaffected), some sampling strata length data were supplemented using data from previous years, which is considered to have limited impact on the assessment.



**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.

### Issues relevant for the advice

ICES was requested by the EU to provide updated advice on fishing opportunities for 2018 because a benchmark of the assessment had been conducted in early 2018. Advice is also provided on fishing opportunities for 2018.

Following the 2018 benchmark the perception of the current SSB has not changed ( $B < B_{lim}$ ). Given the current low F and the above-average recruitment in 2013 and 2014, SSB in 2019 and 2020 is predicted to be above  $B_{lim}$ , allowing for some catches in 2018 and 2019.

While the updated advised catch for 2018 based on the new assessment is a total catch of 880 tonnes, the catch forecast for 2019 assumed that the actual catch in 2018 would be 1240 tonnes. This is because the forecast for 2019 is based on the assumption that the fishing mortality in 2018 would be equal to 0.107, corresponding to the average fishing mortality for the commercial fleet in the period 2015-2017 and the recreational fishery. This is considered to be in line with the management measures in place in 2018. A higher F in 2018 compared to what was assumed would have resulted in a lower catch advice for 2019 and conversely, a lower F in 2018 would have resulted in a higher catch advice for 2019. Advice for 2018 according to the MSY approach is based on rebuilding the stock to  $B_{lim}$  by 2019.

The emergency measures introduced in 2015 reduced not only pelagic trawl catches of sea bass but also bycatch of sea bass in other fisheries. ICES estimates of recreational removals are derived from the 2012 estimate. In this year's assessment, estimates from 2015 onwards take into account the management measures. Additional information on recreational removals from all countries is needed in order to improve these estimates and the stock assessment model.

Stock identity remains poorly understood and tagging and genetic studies are ongoing to address this.

## 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 $B_{trigger}$	13465 tonnes	$B_{pa}$	ICES (2018a)
	$F_{MSY}$	0.203	Stochastic simulations (EqSim)	ICES (2018a)
Precautionary approach	$B_{lim}$	9618 tonnes	$B_{loss}$ (lowest value in the time-series, SSB in 2016 as estimated by the benchmark assessment)	ICES (2018a)
	$B_{pa}$	13465 tonnes	$B_{lim} \times 1.4$	ICES (2018a)
	$F_{lim}$	0.295	Stochastic simulations (EqSim)	ICES (2018a)
	$F_{pa}$	0.211	$F_{lim} / 1.4$	ICES (2018a)
Management plan*	MAP MSY $B_{trigger}$	13465 tonnes	MSY $B_{trigger}$	
	MAP $B_{lim}$	9618 tonnes	$B_{lim}$	
	MAP $F_{MSY}$	0.203	$F_{MSY}$	
	MAP range $F_{lower}$	0.141	Consistent with ranges provided by ICES (2018a), resulting in no more than 5% reduction in long-term yield compared with MSY.	
	MAP range $F_{upper}$	0.203	Consistent with ranges provided by ICES (2018a), resulting in no more than 5% reduction in long-term yield compared with MSY.	

\* Proposed EU multiannual plan (MAP) for the Western Waters (EU, 2018).

## 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, 2016).
Assessment type	Age- and length-based analytical assessment (Stock Synthesis 3; NOAA Toolbox) that uses landings, discards, and recreational removals in the model and in the forecast.
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); recreational removals estimated for 2012, inferred from recreational fishery surveys since 2009 (ICES, 2018a).
Discards and bycatch	Discarding included for some of the fleets.
Indicators	None.
Other information	Benchmarked in WKBASS 2018 (ICES, 2018a)
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

## 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	
2015	MSY approach	< 1155***	none	2081	2066	40	
2016	MSY approach	≤ 541***	none	1290^^	1295	196	
2017	Precautionary approach	0	none	949^^	984	162	
2018	MSY approach	≤ 880^^^	none				
2019	MSY approach	≤ 1789^^^					

\* 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%).

## 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 2017 as estimated by ICES.

Total catch	Commercial landings						Commercial discards	Recreational removals
	1362 tonnes	32% lines	27% bottom trawlers	22% other gears	12% fixed/drift nets	6% Danish seine		
	984 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	2033	574	308	162	3290	4377
2007	178	1	0	1975	713	376	142	3385	4064
2008	188	0	0	1420	791	380	123	2902	4107
2009	173	0	0	2732	697	395	91	4088	3889
2010	215	4	0	3294	736	399	120	4768	4562
2011	152	2	0	2566	793	395	90	3998	3858
2012	154	3	0	2399	892	376	55	3879	3987
2013	145	5	2	2786	803	370	37	4148	4137
2014	146	1	0	1309	1038	253	37	2784	2682
2015	40	0	0	1110	683	207	26	2066	2066
2016**	23	0	0	547	550	151	23	1295	1295
2017**	22	0	0	442	386	122	12	984	984

\* Landings since 2000 are ICES estimates.

\*\* 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	High	Low	SSB	High	Low	Commercial landings	Commercial discards*	Recreational removals**	F ages 4-15	High	Low
	thousands			tonnes			tonnes					
1985	936	1795	78	28630	35851	21410	994		2148	0.096	0.123	0.069
1986	2703	4943	463	25294	31764	18824	1318		1933	0.111	0.142	0.08
1987	22453	29024	15883	22663	28434	16891	1979		1753	0.142	0.180	0.103
1988	17635	25355	9914	20651	25841	15461	1239		1616	0.116	0.147	0.086
1989	103517	119384	87650	19708	24508	14908	1161		1490	0.117	0.148	0.086
1990	8021	13671	2371	18009	22507	13511	1064		1342	0.119	0.152	0.086
1991	15955	22538	9372	15767	19932	11602	1226		1224	0.136	0.174	0.097
1992	25124	32902	17345	13779	17576	9982	1186		1222	0.139	0.177	0.10
1993	11595	17237	5953	13983	17465	10500	1256		1383	0.135	0.168	0.102
1994	35621	45941	25301	16818	20127	13510	1370		1640	0.122	0.149	0.096
1995	56123	67648	44598	21085	24509	17660	1835		1848	0.133	0.160	0.106
1996	3148	5840	457	23473	27124	19822	3022		1890	0.179	0.21	0.143
1997	59513	71315	47711	22757	26468	19047	2620		1819	0.166	0.199	0.133
1998	18554	28004	9104	21507	25153	17860	2390		1766	0.161	0.193	0.129
1999	51669	63859	39480	20888	24421	17355	2670		1765	0.172	0.21	0.138
2000	24984	33712	16257	21046	24497	17594	2407		1816	0.160	0.192	0.127
2001	25883	36506	15259	22151	25642	18660	2500		1898	0.160	0.193	0.128
2002	40241	53334	27147	23003	26551	19455	2622		1980	0.160	0.191	0.128
2003	40655	52229	29080	24020	27627	20412	3459		2035	0.188	0.23	0.15
2004	31594	41447	21741	24364	28016	20712	3731		2048	0.196	0.24	0.156
2005	21827	29292	14362	24326	27999	20653	4430		2014	0.23	0.27	0.178
2006	24330	31746	16913	23266	26928	19603	4377		1955	0.23	0.28	0.182
2007	26318	34776	17860	22176	25751	18601	4064		1922	0.22	0.27	0.176
2008	15153	21819	8486	21798	25237	18359	4107		1902	0.23	0.28	0.18
2009	12570	17490	7650	21479	24786	18173	3889	151	1859	0.22	0.27	0.177
2010	3328	6148	508	20780	23955	17605	4562	148	1751	0.27	0.32	0.21
2011	11755	16503	7007	18894	21897	15892	3858	22	1604	0.25	0.30	0.196
2012	4909	7847	1971	17269	20092	14446	3987	157	1440	0.28	0.34	0.21
2013	18492	29053	7931	15267	17950	12584	4137	53	1227	0.32	0.40	0.24
2014	21989	36374	7603	12584	15185	9983	2682	25	1020	0.26	0.33	0.193
2015	4681	8917	445	10600	13172	8027	2066	40	703	0.24	0.31	0.163
2016	16393^			8876	11434	6318	1295	196	212	0.147	0.20	0.095
2017	16393^			8326	10922	5731	984	162	216	0.120	0.162	0.078
2018	16393^			8513	11295	5731						

\* Incomplete for some fleets.

\*\* Estimated.

^ Geometric mean recruitment (1985-2015).

## Sources and references

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