

**ECOREGION** Celtic Sea and West of Scotland + North Sea  
**STOCK** European sea bass in Divisions IVbc, VIIa, and VIId–h (Irish Sea, Celtic Sea, English Channel, and southern North Sea)

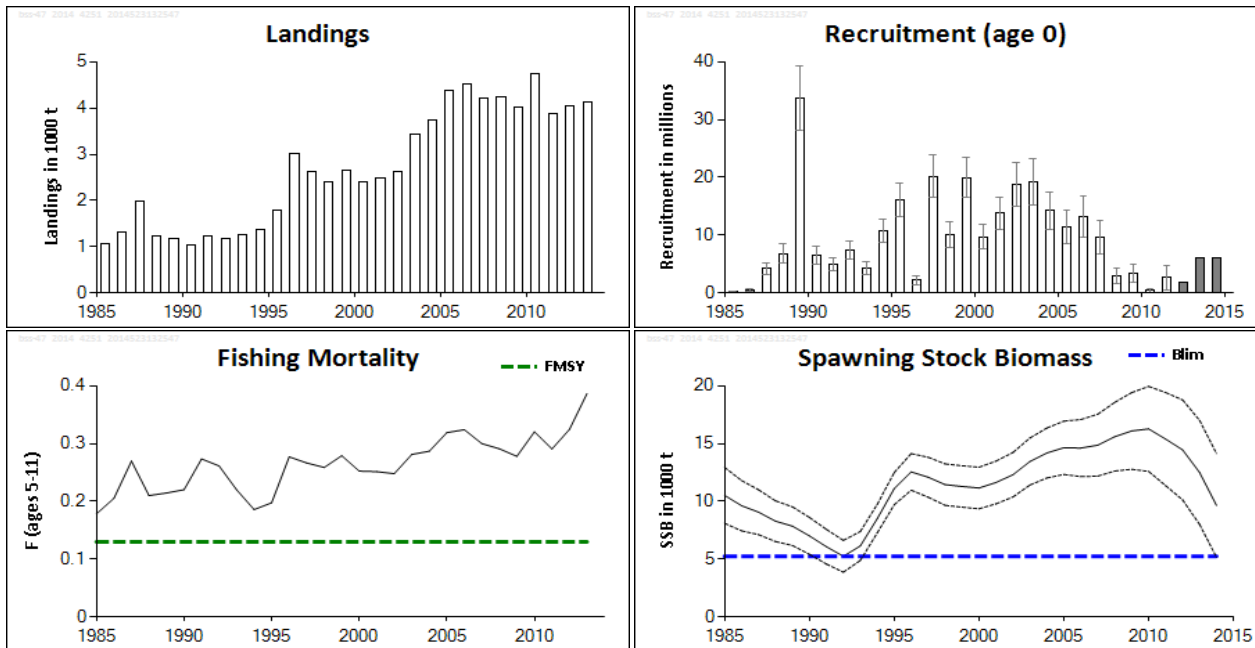
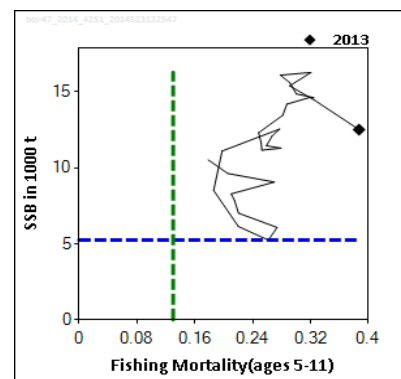
**Advice for 2015**

ICES advises on the basis of the MSY approach, but cannot quantify the resulting catches. The implied total landings should be no more than 1155 t. ICES has no basis for advising on the allocation of the advised landings to commercial and recreational fisheries. The commercial landings corresponding to the advice will depend on the recreational landings and vice versa.

ICES advises that a management plan is urgently needed to develop and implement measures to substantially reduce fishing mortality throughout the range of the stock.

**Stock status**

Fishing pressure				
	2011	2012	2013	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
Stock size				
	2012	2013	2014	
MSY ( $B_{trigger}$ )	?	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Above $B_{lim}$



**Figure 5.3.32.1** European sea bass in Divisions IVbc, VIIa, and VIId–h. Summary of stock assessment (weights in thousand tonnes). Fishing mortality for combined commercial and recreational fisheries. Predicted values are shaded. Top right: SSB and F over the time-series used in the assessment.

Strong year classes in 1989 and some subsequent years caused a rapid increase in biomass throughout the stock area, and landings and fishing mortality in the commercial fishery also increased. The combined commercial and recreational fishery  $F$  is well above the  $F_{MSY}$  proxy. Recruitment has been declining since the mid-2000s, and has been very poor since 2008. The combination of declining recruitment and increasing  $F$  is causing a rapid decline in biomass.

## Management plans

No specific management objectives are known to ICES. There is no TAC for this species.

## Biology

Sea bass grow slowly, do not mature until 4–7 years of age, and have been recorded up to 28 years of age. Juvenile bass up to three years of age occupy nursery areas in estuaries whilst adults undertake seasonal migrations from inshore habitats to offshore spawning sites where they are targeted by pelagic trawlers. After spawning, sea bass tend to return to the same coastal sites each year. The combination of slow growth, late maturity, spawning aggregation, and strong site fidelity increases the vulnerability of sea bass to overexploitation and localized depletion. A new stock definition was considered in 2013; however, it is not clear if sea bass in Divisions IVbc, VIIa, and VIII d–h constitutes a separate stock. It is possible that sea bass in the area has a connection with sea bass in Division VIIj and Subarea VIII.

## Environmental influence on the stock

Ocean warming in recent decades has likely led to the more northerly distribution of sea bass, which are now found further north into the North Sea. Above-average sea temperatures are expected to be favourable for survival of young bass in estuarine nursery areas, which may explain the increased frequency of strong year classes from the mid-1990s to the early 2000s. The increase in sea temperature may also have been responsible for adult sea bass remaining for a longer period of the year in the near-shore areas of the English Channel and Celtic Sea. More recent years have been characterized by colder winters, which may explain the apparent decline in recruitment.

## The fisheries

Sea bass are targeted by pelagic pair trawlers on offshore spawning grounds during December to April, and are taken as seasonal target or bycatch by a large fleet of inshore vessels using a variety of gears. Discarding is low, except for some small-mesh trawl fleets operating inshore near nursery areas. Sea bass is an important marine recreational angling species in the UK, Ireland, France, the Netherlands, and Belgium. A moratorium on commercial fishing for this species by Irish vessels has been in effect since 1990; as a result, unavoidable catches by Irish commercial vessels are discarded.

<b>Catch distribution</b>	Catch (2013) is unknown, commercial landings (2013) = 4132 t (UK and France: 21% bottom trawlers; 37% pelagic pair trawlers; 13% fixed/drift nets; 12% lines; 3% other gears. Other countries: 14% all gears). Discards are known to take place but cannot be fully quantified (they are likely to be in the order of 5% in weight). Recreational catch is known to be substantial but cannot be fully quantified (surveys indicate total annual removals by France, UK (England), Netherlands and Belgium of the order of 1 500 t in the last few years).
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## Quality considerations

The data are considered adequate for providing quantitative advice. There are, however, uncertainties in the assessment due to inaccuracies in historical landings, particularly before 2000: a lack of a time-series of recreational catches, and the absence of length compositions for French fleets prior to 2000. Exchanges between stocks in Subareas IV, VII, and VIII remain poorly defined and further studies are underway. Survival rates of sea bass discarded from commercial vessels and released by anglers are poorly understood.

## Scientific basis

<b>Stock data category</b>	1 ( <a href="#">ICES, 2014a</a> ).
<b>Assessment type</b>	Age- and length-based analytical assessment (Stock Synthesis 3; NOAA Toolbox).
<b>Input data</b>	Commercial landings (international landings, ages and length frequencies from catch sampling); one pre-recruit survey (UK Solent autumn survey); one bottom trawl survey (Channel Groundfish Survey); growth and maturity data from sampling of commercial catches and surveys; natural mortality (inferred from life history parameters and maximum observed ages); recreational fishing mortality inferred from recreational fishery surveys since 2009.
<b>Discards and bycatch</b>	Discards are known to take place but cannot be fully quantified (in the order of 5% in weight).
<b>Indicators</b>	None.
<b>Other information</b>	This stock was benchmarked in 2012 and 2014 (ICES, 2012, 2014b).
<b>Working group</b>	Working Group for the Celtic Seas Ecoregion ( <a href="#">WGCSE</a> ).

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**Reference points**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY approach	MSY B <sub>trigger</sub>	Not defined.	
	F <sub>MSY</sub>	0.13	Proxy based on F <sub>35% SPR</sub> (ICES, 2014b).
Precautionary approach	B <sub>lim</sub>	5250 t	Lowest observed spawning-stock biomass (ICES, 2014b).
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

(Last changed in: 2014)

*Yield and spawning biomass per Recruit F-reference points (2014)*

	Fish Mort <sup>1)</sup>	Yield/R <sup>1)</sup>	SSB/R
Ages 5–11			
Average last 3 years	0.33	0.40	0.94
F <sub>max</sub> <sup>2)</sup>			
F <sub>0.1</sub>	0.12	0.36	2.4
F <sub>35%SPR</sub>	0.13	0.36	2.3
F <sub>med</sub>	0.26	0.40	1.2

<sup>1)</sup> Combined commercial and recreational fishery.

<sup>2)</sup> F<sub>max</sub> not well defined.

**Outlook for 2015**

Basis: F (2014) = F (2011–2013) = 0.33 (commercial fishery F = 0.24; recreational fishery F = 0.09); SSB (2015) = 7591; Recruitment (2014) = 6.06 million = GM 1985–2011; Total catch (2014) = unknown; Total landings (commercial + recreational) (2014) = 3509; Discards = unknown.

Rationale	Total landings (2015) <sup>1)</sup>	Basis	F Total	SSB (2016)	%SSB change <sup>2)</sup>
MSY approach	1155	F <sub>MSY</sub> = 0.13	0.13	7241	-5%
Zero catch	0	F <sub>total</sub> = 0	0	8285	+9%
Other options	2685	F <sub>2014</sub>	0.33	5869	-23%
	2219	0.8 × F <sub>2014</sub>	0.27	6286	-17%
	1720	0.6 × F <sub>2014</sub>	0.20	6733	-11%
	1185	0.4 × F <sub>2014</sub>	0.13	7214	-5%
	613	0.2 × F <sub>2014</sub>	0.07	7730	+2%

Weights in tonnes.

The option of TAC changes are not presented, since there is no TAC for sea bass.

<sup>1)</sup> Commercial and recreational landings.

<sup>2)</sup> SSB in 2016 relative to SSB in 2015.

**MSY approach**

Following the ICES MSY approach implies fishing mortality to be reduced to 0.13. ICES cannot quantify the resulting catches. The implied total landings (commercial and recreational) should be no more than 1155 t in 2015. ICES has no basis for advising on the allocation of the advised landings to commercial and recreational fisheries. The commercial landings corresponding to the advice will depend on the recreational landings and vice versa. Discards are known to take place but cannot be quantified.

## **Additional considerations**

### *Advice considerations*

ICES advises that a management plan for sea bass is needed. The fishing mortality needs to be reduced. The stock is likely to decline further in the short term due to recent low recruitment. In the longer term, management of sea bass fisheries could take into account the objectives and the economic and social value of the commercial and recreational fisheries that share the resource, adopting a common methodological approach to estimate the value of each fishery. The interrelationship between markets for wild-caught and farmed sea bass should be evaluated.

### *Management considerations*

Discarding is mainly an issue at present with otter trawlers using 80–90 mm mesh in or near areas where juvenile bass are most abundant, for example in coastal waters of the eastern Channel.

Improvements to fishery selectivity are needed to allow more fish to spawn at least once before capture. This would require changes to gear designs and spatial management approaches.

As sea bass is at present a non-TAC species, there is potential for displacement of fishing effort from other species with limiting quotas. The effort of the French pelagic fisheries for sea bass during winter and spring can shift between the Bay of Biscay and the English Channel, and there is evidence for such a shift to the Channel in recent years. These developments are likely to have increased the fishing mortality on sea bass in Subarea VII.

### *Regulations and their effects*

The official minimum landing size is 36 cm ([EC regulation 850/98](#)). In addition, a variety of national restrictions on commercial and/or recreational sea bass fishing are also in place, including licensing (specific sea bass licensing introduced in France from 2012), individual landings limitations, larger minimum landing size (MLS), seasonal/area closures, and weekly limits on individual vessel landings.

A moratorium on commercial fishing for sea bass by Irish vessels in Subareas VI and VII has been in place since 1990.

### *Data and methods*

The assessment model has been benchmarked in 2014, involving several changes to improve the robustness of the assessment. These include improvements to the way the selectivity of fishing fleets is modelled; the addition of the Channel Groundfish Survey; removal of two pre-recruit survey time-series (retaining the Solent autumn survey); and inclusion of an additional mortality parameter to represent recreational fishing. These changes have scaled biomass and recruitment estimates upwards, reduced the apparent rate of increase in fishing mortality over time, and altered the pattern of biomass decline in recent years. However, the general trend of declining biomass due to poor recruitment and increasing F remains the same in both assessments.

A recreational fishing mortality is estimated in the model to give recreational landings in 2012 consistent with estimates from surveys carried out in France, England, the Netherlands, and Belgium in recent years.

### *Uncertainties in the assessment and forecast*

There is no time-series to evaluate how variable the recreational fishing mortality is over time. Including the recent recreational landings estimate in the stock assessment implies that recreational F could be almost 30% of the total fishery F, although this proportion is uncertain and will vary over time according to the relative trends in commercial and recreational fishing effort on sea bass. A large percentage of sea bass are released by recreational fishers, but the mortality of the releases is poorly understood.

There are uncertainties in the assessment due to inaccuracies in historical landings (particularly before 2000), a lack of a time-series of recreational catches, and an absence of length compositions for French fleets prior to 2000. The survival rates of sea bass discarded from commercial vessels and released by anglers are poorly understood.

The landings from the small-scale fisheries as reported and used in the assessment are potentially underestimated.

The assessment currently treats all sea bass in the North Sea, English Channel, eastern Celtic Sea, and the Irish Sea as a single, homogeneous stock, independent of sea bass in the Bay of Biscay and off southern Ireland, which may not be correct. Abundance indices from two surveys in the eastern English Channel are assumed representative of the stock as

a whole, which may not be correct in all years. Despite these uncertainties, the trends in biomass, recruitment, and fishing mortality are considered by ICES to be robust.

#### *Data requirements*

Time-series of relative abundance indices need to be developed throughout the range of the stock, for both the adult and pre-recruit components of the stock.

There is a need to ensure adequate and representative sampling coverage of fleets catching sea bass, including developing regional time-series of recreational fishery catch, effort, and catch composition.

Further studies using tagging, genetics, and other stock and individual markers are needed to more accurately define stock boundaries suitable for assessment and management purposes.

Studies are needed to estimate the survival of recreationally caught and released sea bass.

#### *Comparison of the basis of previous assessment and advice*

The basis for the advice is an analytical assessment. The assessment was considered last year to be appropriate only for providing trends-based advice, but improvements to the data and assessment this year allow estimates of fishing mortality, biomass, and biological reference points to be presented.

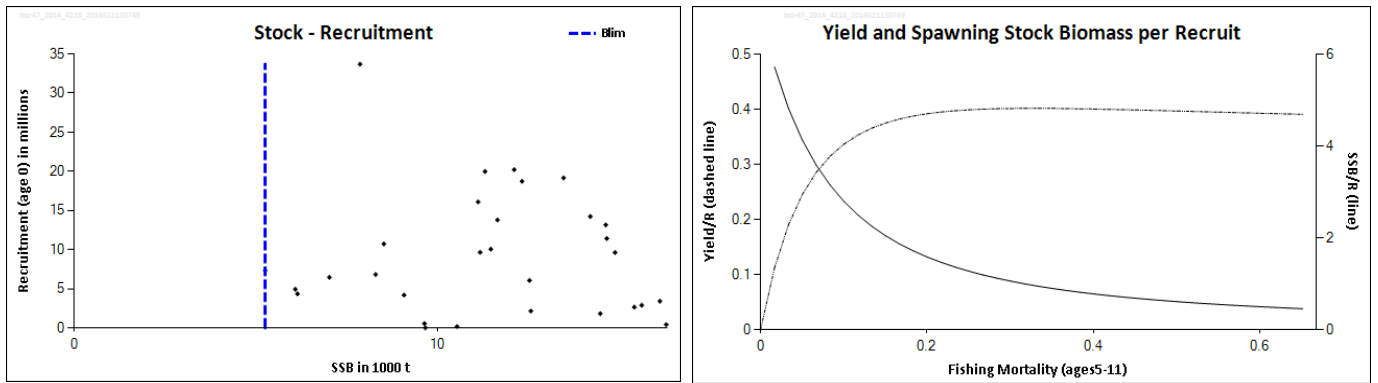
Last year's advice was based on ICES approach to data-limited stocks. This year's advice is based on the MSY approach.

#### **Assessment and management area**

The stock structure of sea bass is currently uncertain, although the populations around southern Ireland and in the Bay of Biscay are treated as separate from sea bass populations in the eastern Celtic Sea, English Channel, and North Sea. The sea bass at the north Brittany coast may mix with the population in the Bay of Biscay. Further work is needed to define the stock structure of sea bass in Subareas IV, VII, and VIII, and in appropriate management areas.

#### **Sources**

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- ICES. 2014b. Report of the Inter-Benchmark Protocol for Sea Bass in the Irish Sea, Celtic Sea, English Channel, and Southern North Sea (IBP–Bass). By correspondence. ICES CM 2014/ ACOM:46.
- ICES. 2014c. Report of the Working Group for the Celtic Seas Ecoregion (WGCSE), 13–22 May 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:12.



**Figure 5.3.32.2** European sea bass in Divisions IVbc, VIIa, and VIII-d-h. Yield- and SSB-per-recruit analysis. Yield refers to all commercial and recreational fishery removals.

**Table 5.3.32.1** European sea bass in Divisions IVbc, VIIa, and VIII-d-h. ICES advice, management, official commercial landings, and ICES commercial landings.

Year	ICES Advice	Predicted catch corresp. to advice <sup>a</sup>	Agreed TAC	Official landings <sup>b</sup>	ICES landings <sup>b</sup>
2000	-	-	none	2.1	2.4
2001	-	-	none	2.2	2.5
2002	No increase in effort or F	-	none	2.4	2.6
2003	No increase in effort or F	-	none	2.9	3.4
2004	No increase in effort or F	-	none	3.0	3.7
2005	-	-	none	3.2	4.4
2006	-	-	none	3.4	4.5
2007	-	-	none	3.5	4.2
2008	-	-	none	3.0	4.2
2009	-	-	none	4.3	4.0
2010	-	-	none	4.9	4.8
2011	-	-	none	3.9	3.9
2012	No increase in catch	-	none	3.9	4.1
2013	20% reduction in catches (last 3 years' average)	< 6.0 <sup>b</sup>	none	4.1	4.1
2014	36% reduction in commercial landings (20% reduction, followed by 20% precautionary reduction)	< 2.707 <sup>b</sup>	none		
2015	MSY approach	< 1.155 <sup>c</sup>			

Weights in thousand tonnes.

<sup>a</sup> Advice prior to 2014 was given for sea bass in the Northeast Atlantic.

<sup>b</sup> Commercial landings.

<sup>c</sup> Total landings (commercial and recreational landings).

**Table 5.3.32.2** European sea bass in Divisions IVbc, VIIa, and VIId–h. Official commercial landings by area/country and ICES estimates of commercial landings (t).

	Belgium	Denmark	Germany	France <sup>1</sup>	UK	Netherlands	Channel Is.	Total	Total ICES <sup>2</sup>
1985	0	0		620	105	0	18	743	1076
1986	0	0		841	124	0	15	980	1315
1987	0	0		1226	123	0	14	1363	1979
1988	0	18		714	173	8	12	925	1238
1989	0	2		675	191	2	48	918	1161
1990	0	0		609	189	0	25	823	1033
1991	0	0		726	239	0	16	981	1225
1992	0	0		721	148	0	36	905	1184
1993	0	1		718	230	0	45	994	1251
1994	0	0		593	535	0	49	1177	1370
1995	0	1		801	707	0	69	1578	1777
1996	0	1		1703	562	8	56	2330	3023
1997	0	1		1429	560	1	74	2065	2620
1998	0	2		1363	487	48	79	1979	2388
1999	0	1		0	684	32	108	825	2665
2000	0	5		1522	406	60	130	2123	2397
2001	0	2		1619	458	77	80	2236	2482
2002	0	1		1580	627	96	73	2377	2628
2003	154	1		1903	586	163	84	2891	3445
2004	159	1		1883	617	191	159	3010	3730
2005	206	1		1937	512	327	220	3203	4392
2006	211	2		2116	574	308	193	3404	4522
2007	178	1		2074	713	376	160	3502	4213
2008	188	0		1506	791	380	143	3008	4244
2009	173	0		2905	697	395	103	4273	4013
2010	215	4		3441	736	399	144	4939	4758
2011	152	2		2526	795	395	0	3870	3870
2012	149	3		2492	885	372	46	3946	4060
2013	145	4	2	2770	804	369	27	4121	4132

Source: Official catch statistics 1950–2010 (dataset 2011) and 1992–2011 (dataset 2013), ICES, Copenhagen.

<sup>1</sup> Landings for 2000–2010 supplied by Ifremer.

<sup>2</sup> Includes adjustments to pre-2000 French statistics in line with ratio of Ifremer to official figures in later years.

**Table 5.3.32.3** European sea bass in Divisions IVbc, VIIa, and VIII–h. Survey estimates of annual recreational fishery catches of sea bass in France, Netherlands, UK (England) and Belgium from surveys in recent years. RSE = relative standard error. Release rate is proportion released alive, by weight or number.

Country	Year	Area	Weight / Number	Kept	RSE	Released	RSE	Total	RSE	Release rate
France	2009-2011 <sup>a,b)</sup>	Northeast Atlantic	Weight	2 343t	-	830t		3 173t	26%	26%
		ICES Div. IV & VII	Weight	940t		332t		1 272t	>26%	26%
	2011-2012	Northeast Atlantic	Weight	3 146t	-	776t		3 922t	-	20%
Netherlands	March 2010-Feb 2011	North Sea	Number	234 000	38%	131 000	27%	366 000	30%	64%
		North Sea	Weight <sup>c)</sup>	138t	37%					
UK (England)	2012 <sup>d)</sup>	IV & VII	Weight	230– 440t		150-250t		380 – 690t	26-38%	36-39%
Belgium	2013	North Sea	Weight	60t	-	-	-	-	-	-

<sup>a)</sup> ~ 80% by weight in 2009/11 was recreational sea angling.

<sup>b)</sup> RSE was 26% for area VII and VIII combined; area VII represented 40% of total.

<sup>c)</sup> 98% by weight is recreational sea angling.

<sup>d)</sup> Survey covered only recreational sea angling



**Table 5.3.32.4** European sea bass in Divisions IVbc, VIIa, and VIId–h. Assessment summary.

Year	Recruitment Age 0 (thousands)	High	Low	SSB (t)	High	Low	TSB (t)	Commercial landings (t)	Mean Total F <sup>a</sup> (Ages 5–11)
1985	156	242	71	10529	12949	8108	13977	1076	0.178
1986	540	777	303	9632	11810	7453	13368	1315	0.205
1987	4192	5260	3124	9070	11013	7127	12494	1979	0.27
1988	6815	8414	5215	8288	10051	6526	10903	1238	0.21
1989	33699	39236	28161	7859	9533	6186	9961	1161	0.215
1990	6457	7962	4951	7018	8616	5419	9670	1033	0.22
1991	4929	6151	3708	6080	7581	4579	10854	1225	0.274
1992	7333	8928	5739	5251	6629	3873	12525	1184	0.261
1993	4345	5456	3233	6141	7393	4888	14757	1251	0.22
1994	10722	12825	8618	8517	9753	7280	16962	1370	0.186
1995	16091	18944	13239	11108	12500	9715	18383	1777	0.198
1996	2150	2841	1459	12558	14143	10973	18982	3023	0.277
1997	20216	23892	16540	12098	13827	10370	18423	2620	0.267
1998	10051	12297	7806	11457	13250	9664	18206	2388	0.259
1999	19980	23520	16440	11297	13092	9502	18767	2665	0.279
2000	9650	11787	7512	11164	12963	9364	19430	2397	0.253
2001	13789	16640	10938	11640	13491	9789	20781	2482	0.252
2002	18733	22598	14867	12315	14241	10389	22204	2628	0.248
2003	19164	23197	15130	13459	15497	11421	23700	3445	0.281
2004	14235	17505	10965	14195	16358	12032	24732	3730	0.287
2005	11416	14284	8547	14647	16956	12338	25657	4392	0.319
2006	13149	16670	9629	14620	17091	12149	26020	4522	0.324
2007	9620	12618	6623	14872	17553	12191	26196	4213	0.3
2008	2888	4278	1498	15609	18582	12635	26353	4244	0.291
2009	3401	5025	1776	16105	19428	12783	25819	4013	0.278
2010	418	751	84	16281	19964	12597	24612	4758	0.321
2011	2648	4774	523	15402	19433	11370	21929	3870	0.291
2012	1815 <sup>b</sup>			14466	18795	10136	19221	4060	0.325
2013	6057 <sup>c</sup>			12520	17024	8015	15822	4132	0.387
2014	6057 <sup>c</sup>			9655	14149	5160	12344		
<b>Average</b>	<b>9357</b>	<b>12106</b>	<b>7656</b>	<b>11462</b>	<b>13789</b>	<b>9134</b>		<b>2696</b>	<b>0.265</b>

<sup>a</sup> Including 0.092 for recreational fishery.

<sup>b</sup> Geometric mean 2008–2011.

<sup>c</sup> Geometric mean 1985–2011.