

6.3.40 Sandeel (*Ammodytes* spp.) in Divisions 4a and 4b, SA 4 (North and Central North Sea)

ICES stock advice

ICES advises that when the precautionary approach is applied, catches in 2016 should be no more than 6000 tonnes with an associated sampling protocol in the fishery in order to obtain sufficient data for assessment purposes.

Stock development over time

Survey data indicate that the 2014 year class in sandeel area 4 (SA 4) is the strongest since 2009.

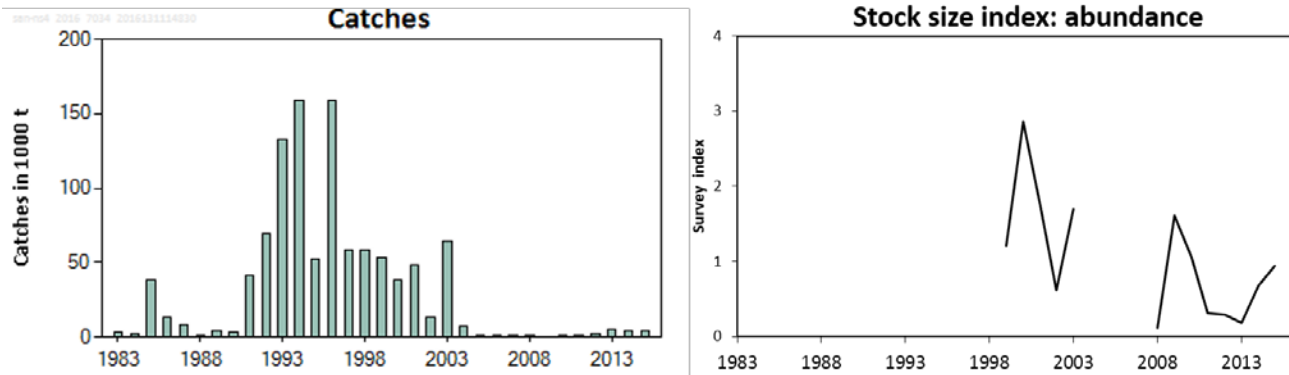


Figure 6.3.40.1 Sandeel in the North Sea (SA 4). Left graph: catches and right: stock size abundance index from the dredge survey (number per hour).

Stock and exploitation status

Table 6.3.40.1 Sandeel in the North Sea (SA 4). State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size					
		2013	2014	2015	2014	2015	2016			
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	-	-	-	Not applicable	SSB_{MGT}	-	-	-	Not applicable
Qualitative evaluation		→	→	→	Very low	-	↗	↗	↗	Increasing

Catch options

No analytical assessment or short-term forecast is available for this stock. The ICES framework for category 3 stocks was applied based on a combined abundance index for ages 0 and 1 from the dredge survey of the Firth of Forth (ICES, 2012). This index is estimated to have increased by more than 20% between 2011–2014 (four-year average) and 2015. This implies an increase in catch advice of at most 20% in relation to the advised catch in 2015, corresponding to catches of no more than 6000 tonnes in 2016. The exploitation on the stock is considered to be very low; therefore, no additional precautionary buffer was applied.

Table 6.3.40.2 Sandeel in the North Sea (SA 4). For stocks in ICES categories 3–6, one catch option is possible.

Index A (2015)		0.93
Index B (2011–2014)		0.38
Index ratio (A/B)		2.56
Uncertainty cap	Applied	1.2
Recent advised catch for 2015		5000 tonnes
Discard rate		Negligible
Precautionary buffer	Not applied	-
Catch advice*		6000 tonnes

* (Recent advised catch) × cap.

A traditional age-based, analytical assessment is not available for sandeel in this area; however, with a continued commercial sampling, sufficient samples should be available to investigate an age-based assessment at the next benchmark. In order to present an analytical assessment in the future, data on biological characteristics of the catch composition and catch and effort data are required.

Given that the advised catch of 6000 tonnes is low in relative terms, a special sampling protocol in this fishery, similar to that used for a monitoring TAC, is likely to be necessary in order to obtain sufficient samples to assess the status of the stock in 2017.

Basis of the advice

Table 6.3.40.3 Sandeel in the North Sea (SA 4). The basis of the advice.

Advice basis	Precautionary approach with a sampling protocol in the fishery.
Management plan	There is no management plan for sandeel in this area.

Quality of the assessment

Prior to the establishment of the dedicated Scottish dredge survey in 2008, dredge sampling intensity was low in SA 4. The Scottish dredge survey generally covers the northwestern parts of SA 4. Hence, no dredge sampling is available for the eastern parts of SA 4. As commercial fishing effort has been very low in recent years, there is insufficient information in the commercial catch to be able to provide an analytical assessment similar to those for SAs 1–3. In 2014, bad weather meant that the survey was only conducted inside the Firth of Forth.

Issues relevant for the advice

In 2015, a monitoring TAC of 5000 t was implemented for this stock resulting in 38 samples. This is the first year that the target of 30 samples was reached with a monitoring fishery in SA 4. ICES emphasizes the importance of obtaining sufficient sampling from the fishery.

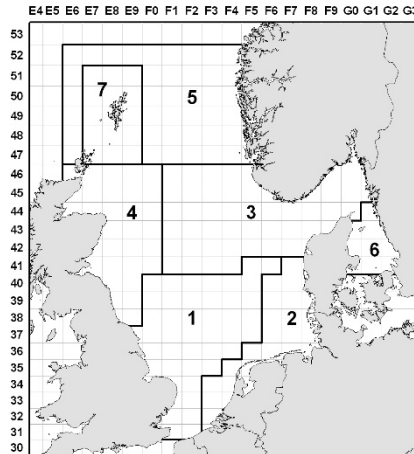


Figure 6.3.40.2 Sandeel in the North Sea (SA 4). Sandeel are largely sedentary after settlement and form a complex of local (sub-)stocks in the North Sea. To avoid local depletion, ICES advice for sandeel is provided separately for seven areas in Division 3a and Subarea 4. Advice for sandeel in the North Sea (SA 4) specifically applies to sandeel in rectangles 38–40 E7–E9 and 41–46 E6–F0.

The fishing effort and CPUE series show a low effort and a high CPUE in most recent years. Despite indications of low recruitment during 2010 to 2013, the catches taken in the southern part of SA 4 in 2013 and 2014 correspond to a high CPUE.

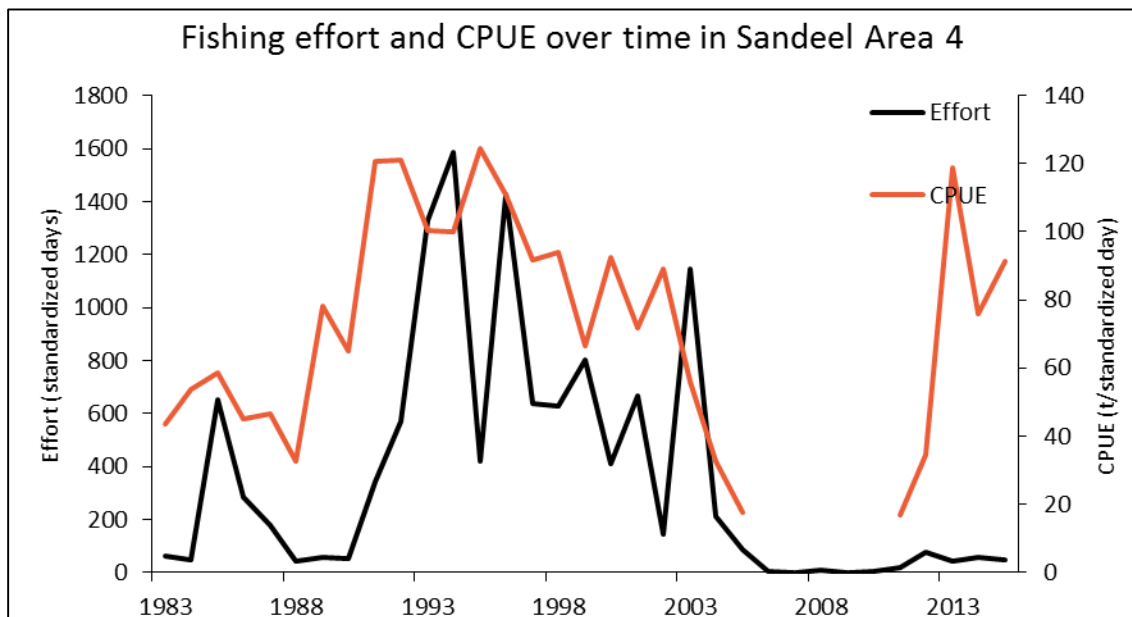


Figure 6.3.40.3 Sandeel in the North Sea (SA 4). Fishing effort and CPUE series over time.

Reference points

No reference points are defined for this stock.

Basis of the assessment

Table 6.3.40.4 Sandeel in the North Sea (SA 4). The basis of the assessment.

ICES stock data category	3.2.0 (ICES, 2016a)
Assessment type	Survey trends-based assessment (ICES, 2016b)
Input data	One survey index available in January (dredge survey). Total international catch.
Discards and bycatch	Discarding is considered to be negligible.
Indicators	Fishing effort and CPUE
Other information	Last benchmark in 2010 (ICES, 2010). This stock will be benchmarked in 2016.
Working group	Herring Assessment Working Group (HAWG)

Information from stakeholders

Fishing industry representatives reported that the work to improve temporal and spatial coverage of the sampling scheme conducted in 2015 will be continued in 2016.

History of advice, catch, and management

Table 6.3.40.5 Sandeel in the North Sea (SA 4). History of ICES advice, the agreed TAC, and ICES estimates of catch. All weights are in thousand tonnes.

Year	ICES advice	Catch corresponding to advice	TAC	ICES catch SA 4	Total ICES catch (SAs 1–7)
2005*	Exploitation to be kept below level of 2003. Adjustment to be made conditional on the abundance of the 2004 year class.	-	661**	1.49	177
2006*	The fishery should remain closed until information is available which assures that the stock can be rebuilt to B_{pa} by 2007.	-	300**	0.09	293
2007*	The fishery should remain closed until information is available which assures that the stock can be rebuilt to B_{pa} by 2008.	-	173**	0.01	230
2008*	The fishery should only be allowed if monitoring information is available and shows that the stock can be rebuilt to B_{pa} by 2009.	-	375**	1.20	348
2009*	The fishery should only be allowed if monitoring information is available and shows that the stock can be rebuilt to B_{pa} by 2010.	-	377**	0	353
2010*	The fishery should only be allowed if monitoring information is available and shows that the stock can be rebuilt to B_{pa} by 2011.	-	377**	0.10	414
2011	A TAC at 5000–10 000 tonnes will impose a low risk of overfishing sandeel in this area.	5–10	10	0.27	438
2012	Catches for monitoring purposes should not exceed 5000 t.	< 5	5	2.5	102
2013	Catch of 2012 reduced by 20% as a precautionary buffer.	< 2.041	4	5.2	278
2014	Catches for monitoring purposes should not exceed 5000 t (with associated sampling protocol).	< 5	5	4.3***	262***
2015	Catches for monitoring purposes should not exceed 5000 t (with associated sampling protocol).	< 5	5	4.4	307
2016	Precautionary approach	≤ 6			

* Advice for Subarea 4, excluding the Shetland area.

** Set for EU waters of Divisions 2a and 3a and Subarea 4.

*** Preliminary.

History of catch and landings

Table 6.3.40.6 Sandeel in the North Sea (SA 4). Catch distribution by fleet in 2015 as estimated by ICES. All weights are in thousand tonnes.

Total catch (2015)	Landings	Discards
4.4 kt	100% industrial trawl fisheries	Negligible
	4.4 kt	

Table 6.3.40.7 Sandeel in the North Sea (SA 4). History of total catch (tonnes) as estimated by ICES.

Year	Catch (tonnes)
1982	
1983	2796
1984	2570
1985	38123
1986	12706
1987	8179
1988	1335
1989	4384
1990	3314
1991	41372
1992	68905
1993	133136
1994	158690
1995	52591
1996	158490
1997	58446
1998	58746
1999	53334
2000	37792
2001	47918
2002	12761
2003	64048
2004	6882
2005	1557
2006	86
2007	11
2008	1168
2009	0
2010	275
2011	272
2012	2585
2013	5225
2014	4414
2015	4384

Summary of the assessment

Table 6.3.40.8 Sandeel in the North Sea (SA 4). Assessment summary. The assessment uses an abundance index from the Scottish December dredge survey in the Firth of Forth (with each age standardized to its long-term mean in the survey, and averaged over ages 0 and 1). Empty cells denote that no data were collected.

Year	Survey Age 0	Survey Age 1	Survey index
1999	1.79	0.62	1.21
2000	1.71	4.01	2.86
2001	0.14	3.36	1.75
2002	0.71	0.51	0.61
2003	1.69		1.69
2004			
2005			
2006			
2007			
2008	0.20	0.03	0.11
2009	2.98	0.22	1.60
2010	0.54	1.57	1.06
2011	0.35	0.28	0.31
2012	0.36	0.23	0.29
2013	0.24	0.11	0.18
2014	1.30	0.05	0.68
2015	0.44	1.42	0.93
Average 2010–2015			0.56

Sources and references

ICES. 2010. Report of the Benchmark Workshop on Sandeel (WKSAN), 6–10 September 2010, Copenhagen, Denmark. ICES CM 2010/ACOM:57. 201 pp.

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

ICES. 2016a. General context of ICES advice. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.

ICES. 2016b. Sandeel in Division 3a and Subarea 4. Available online as Section 11 of the coming Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG), 29 March–7 April 2016, ICES HQ, Denmark. ICES CM 2016/ACOM:07.