

ECOREGION North Sea
STOCK Sprat in Subarea IV (North Sea)

Advice for 2012 (in year advice)

Based on the ICES approach for data limited stocks, ICES advises that catches should not be more than 134 000 tonnes (catches of 2011).

This is the first year that ICES is providing quantitative advice for data limited stocks (see Quality considerations).

Stock status

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Unknown
SSB (Spawning Stock Biomass)	
	2010–2012
Qualitative evaluation	↗ Increasing

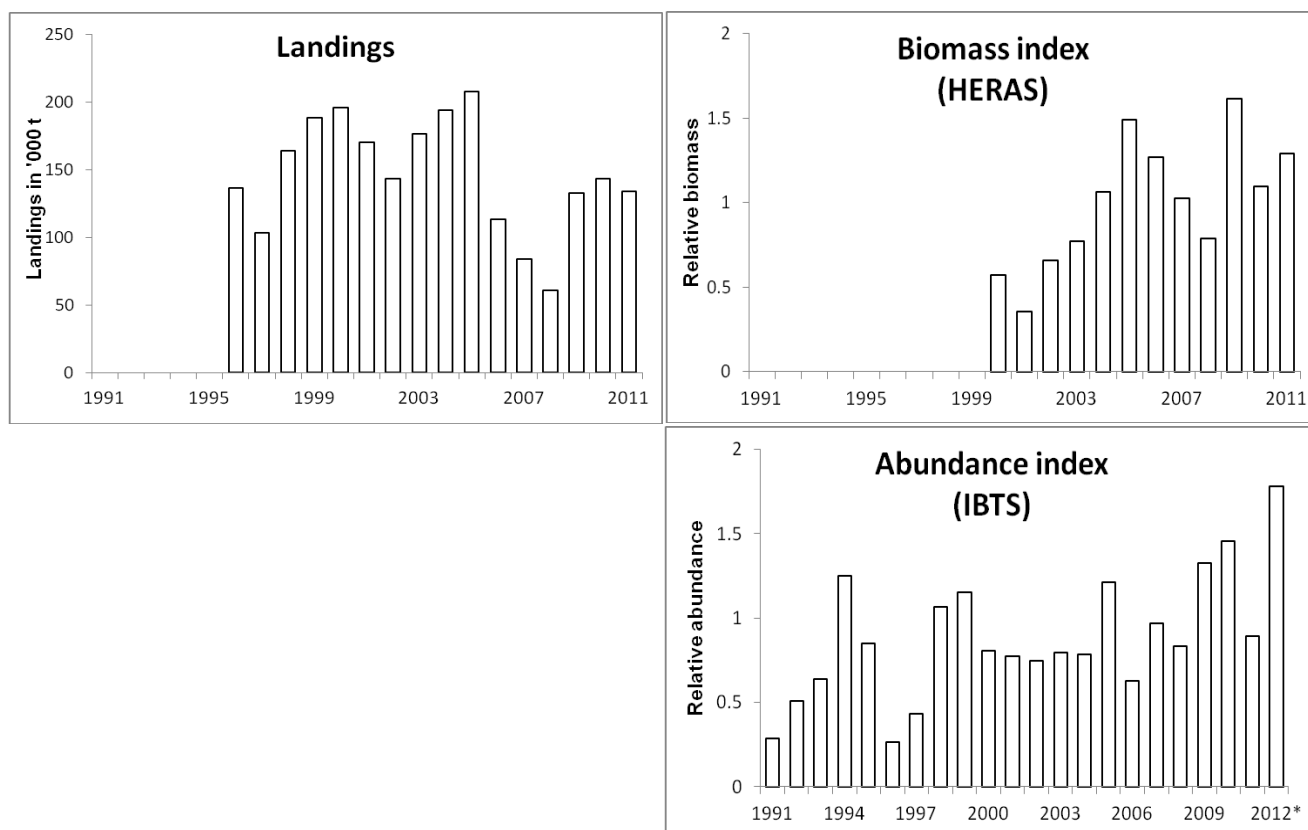


Figure 6.4.18.1 Sprat in Subarea IV (North Sea). ICES estimates of landings (in '000 tonnes), relative biomass estimate from the HERAS survey, and relative abundance estimate from the IBTS survey (* marked estimates are preliminary).

The stock appears to have increased judged from surveys as well as an exploratory assessment. The stock seems to sustain the recent catches.

Management plans

No specific management objectives are known to ICES.

Biology

Sprat in the North Sea is short-lived with high natural mortality and the catch is dominated by young fish. The stock size is mostly driven by the recruiting year class. Thus, the fishery in a given year is dependent on that year's incoming year class.

Environmental influence on the stock

The zooplankton community structure that is sustaining the sprat stocks appears to be changing, and there has been a long-term decrease in total zooplankton abundance in the northern North Sea (Reid *et al.*, 2003; Beaugrand, 2003; ICES, 2006a). The implications of the environmental change for sprat are unknown.

The fisheries

The majority of the sprat landings are taken in the Danish small-meshed trawl fishery. In this fishery there is about 10% bycatch of herring. The Norwegian sprat fishery is mainly carried out by purse seiners. Landings are used for reduction for fish meal and fish oil. Most sprat catches are taken in an a small meshed fishery where catches are limited by herring bycatch restrictions. Bycatches of herring are practically unavoidable except in years with high sprat abundance or low herring recruitment. Given the recent increase in the North Sea Autumn Spawning herring stock, the sprat fishery in has been increasingly limited by the by-catch limits.

Effects of the fisheries on the ecosystem

Sprat is an important prey species in the North Sea ecosystem. The effects of the sprat fishery on other fish species, marine mammals and seabirds are at present unknown.

Quality considerations

Both the IBTS and the HERAS acoustic survey are currently considered to potentially provide basis for an abundance index. The sampling intensity in Subarea IV has improved in 2011, but is still below the reference level of 0.5 sample per kt in Division IVc where the majority of the fisheries takes place. A reanalysis of the data during the 2012/13 benchmark should further reveal data needs.

The methods applied to derive quantitative advice for data limited stocks are expected to evolve as they are further developed and validated.

Scientific basis

Assessment type	There is currently only an explorative assessment for this stock.
Input data	3 survey indices (IBTS Q1&3, HERAS) Commercial landings
Discards and bycatch	Bycatches from the Danish sprat fishery
Indicators	None
Other information	For this short-lived stock, in year advice is given A benchmark for this stock is planned for 2013.
Working group report	HAWG

ECOREGION **North Sea**
STOCK **Sprat in Subarea IV (North Sea)**

Reference points

No reference points are defined for this stock.

Outlook for 2012

No assessment can be presented for this stock. As this species has a very high natural mortality in the North Sea and the fishery is focused on the incoming year class (1 year old fish), only in year advice can be provided.

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, there is currently an increasing trend in abundance while catches have remained fairly constant. Recent catches appear to be sustainable. Therefore, ICES advises that catches in 2012 (in year advice) should not increase in relation to the the 2011 value of 134 000 t.

Additional considerations

Regulations and their effects

In the last decade, also the UK occasionally lands small amounts of sprat. To avoid misreporting Norwegian vessels are not allowed to fish in the Norwegian zone until the quota in the EU-zone has been taken. These vessels are not allowed to fish in the 2nd quarter and July in the EU and the Norwegian zone.

Data exploration

An exploratory assessment on the stock was performed using a stochastic assessment model (SMS). This analysis showed a very good fit of the trawl (IBTS quarter 1) and acoustic (HERAS) surveys and reasonable fit of catch composition of the main target age groups. In addition, there is a reasonable consistency of the different survey time series. All available time series show an increase in recruitment and SSB in recent years.

Comparison with previous assessment and catch options

The basis for the advice last year was precautionary considerations, this year the advice is based on the ICES advice to data limited stocks.

Sources

- Beaugrand, G. 2003. Long-term changes in copepod abundance and diversity in the north-east Atlantic in relation to fluctuations in the hydroclimatic environment. *Fisheries Oceanography*, 12: 270–283.
- ICES. 2006a. Report of the Study Group on Recruitment Variability in North Sea Planktivorous Fish (SGRECVAP). ICES CM 2006/LRC:03. 82 pp.
- ICES. 2006b. Report of the Herring Assessment Working Group South of 62° N (HAWG), 14–23 March, ICES Headquarters. ICES CM 2006/ACFM:20. 647 pp.
- ICES. 2008. Report of the Herring Assessment Working Group South of 62° N (HAWG), 11–19 March 2008, ICES Headquarters, Copenhagen. ICES CM 2008/ACOM:02. 601 pp.
- ICES. 2012. Report of the Herring Assessment Working Group for the Area South of 62° N (HAWG), 13–22 March 2012, ICES Headquarters, Copenhagen, Denmark. ICES CM 2012/ACOM:06.
- Reid, P. C., Edwards, M., Beaugrand, G., Skogen, M., and Stevens, D. 2003. Periodic changes in the zooplankton of the North Sea during the twentieth century linked to oceanic inflow. *Fisheries Oceanography*, 12: 260–269.

Table 6.4.18.1 Sprat in Subarea IV (North Sea). ICES advice, management, catch and landings.

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC ¹	Official Catches	ICES Landings
1987	Catch at lowest practical level	0	57	78	32
1988	TAC < recent catches, preferably zero	0	57	93	87
1989	No advice	-	59	50	63
1990	No advice	-	59	49	73
1991	No advice	-	55	92	112
1992	No advice	-	55	72	124
1993	No advice	-	114	127	200
1994	No advice for sprat; maintain bycatch regulations	-	114	184	320
1995	No advice	-	175	190	357
1996	No advice	-	200	141	136
1997	Enforce by-catch regulations	-	150	123	103
1998	Limited by restrictions on juvenile herring	-	150	175	163
1999	Limited by restrictions on juvenile herring	-	225	167	188
2000	Limited by restrictions on juvenile herring	-	225	208	196
2001	Catch prediction	225	225	180	170
2002	Catch prediction	160	232	167	144
2003	Catch prediction	175	257		177
2004	Catch prediction	171	257		194
2005	Catch prediction	244	257		206
2006	Catch predictions	< 250	175		114
2007	Catch prediction	< 195	175		84
2008	Catch prediction	< 170	170		61
2009	No advice	-	170		133
2010	No advice	-	170		143
2011	Reduce catches	-	170		134
2012	Reduce catches		162		
In year	No increase in catches (2011)	< 134			
2013	Advice for 2013 will be given in 2013				

Weights in '000 t.

¹ EU zone.² Provisional.

Table 6.4.18.2

Sprat in Subarea IV (North Sea). ICES landings by area (in tonnes). See ICES (2006b) for earlier landings data. Catch in fjords of western Norway excluded. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes. The Division IVb catches for 2000–2007 divided by IVbW and IVE can be found in ICES (2008).

Year	Quarter	Area		IVb	IVc	Total
		IVaW	IVaE			
2006	1	25	22	13 713	33 534	47 294
	2			190	8	198
	3			40 051	8	40 059
	4	2		26 579	77	26 658
	Total		27	22	80 533	33 627
2007	1			582	247	829
	2			241	3	244
	3			16 603		16 603
	4	769		41 850	23 531	66 150
	Total		769		59 276	23 781
2008	1			2 872	43	2 915
	2			52	*	52
	3			21 787		21 787
	4			27 994	8 334	36 329
	Total				52 706	8 377
2009	1			36	1 268	1 304
	2			2 526	1	2 527
	3		22	41 513		41 535
	4			78 373	9 336	87 709
	Total			22	122 448	10 604
2010	1			10 976	17 072	28 048
	2			3 235	3	3 238
	3			14 220		14 220
	4			62 006	35 973	97 979
	Total				90 437	53 048
2011	1	0		3747	21039	24 786
	2	0		2067	3	2 070
	3	0		22309	451	22 761
	4	8		70256	13759	84 023
	Total	8	0		98 380	35 252

* < 1 ton