

ECOREGION North Sea
STOCK Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak)

Advice for 2013

ICES advises on the basis of the EU–Norway management plan that landings in 2013 should be no more than 47 811 t.

Stock status

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓ Harvested sustainably
Management plan (F_{MP})	✓	✓	✓ Below target
SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓ Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓ Above trigger

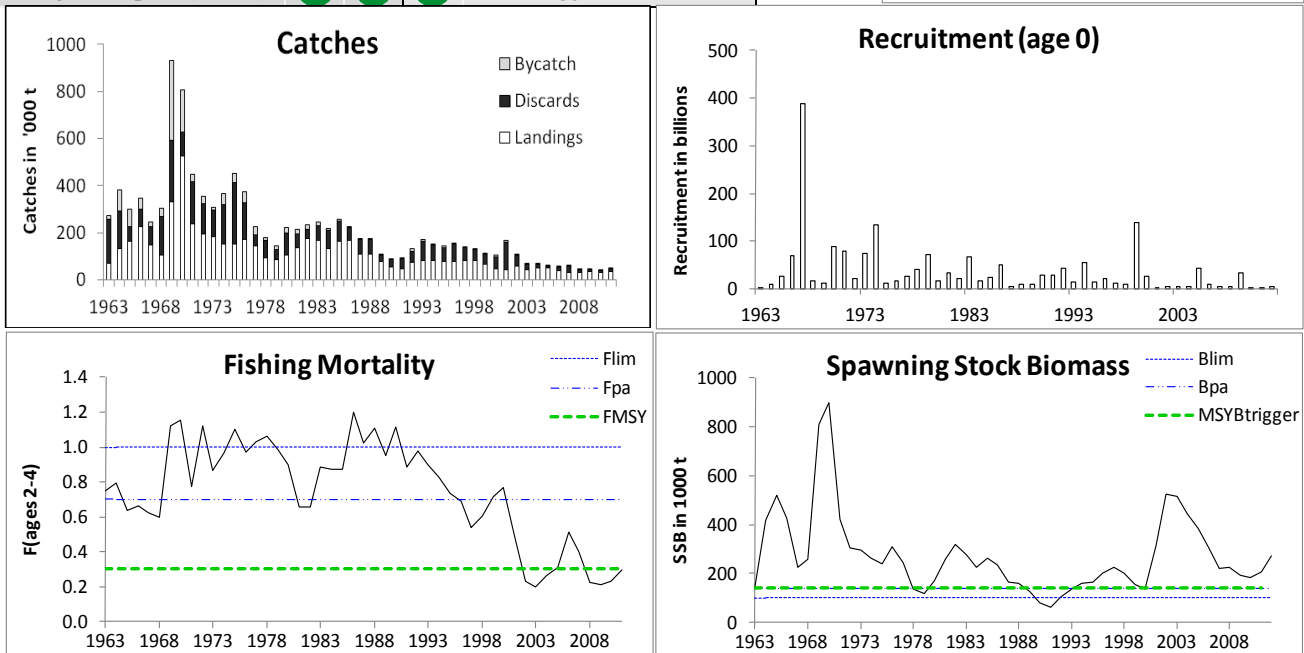
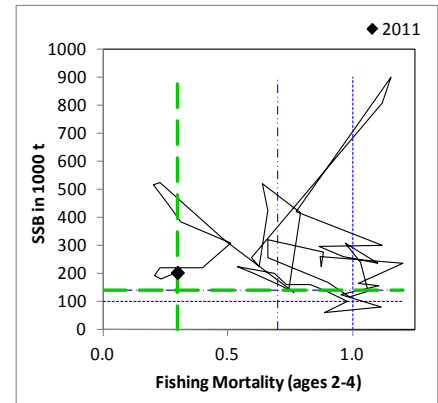


Figure 6.4.3.1 Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). Summary of stock assessment (weights in thousand tonnes), including intermediate-year forecasts for 2012. Top right: SSB and F over the time-series used in the assessment.

Fishing mortality has been below F_{pa} and around F_{MSY} and SSB has been above MSY $B_{trigger}$ since 2001. Recruitment is characterized by occasional large year classes, the last of which was the strong 1999 year class. Apart from the 2005 and 2009 year classes which are about average, recent recruitment has been poor.

Management plans

A management plan was agreed by EU and Norway in 2008 (see Annex 6.4.3). ICES has evaluated the plan and concludes that it can be accepted as precautionary.

Biology

The North Sea haddock stock exhibits sporadic high recruitment, leading to dominant year classes in the fishery. These large year classes often grow more slowly than less abundant year classes, possibly due to density-dependent effects. Recruitment appears poorly determined by either spawning-stock biomass or egg production. Haddock primarily prey on benthic and epibenthic invertebrates, sandeels, and herring eggs. Haddock are an important prey species, mainly for saithe and other large gadoids.

Environmental influence on the stock

Haddock growth may be linked to water temperature. Warmer waters may lead to faster growth in early life stages, but also to faster maturation and a lower maximum size. There are indications that haddock recruitment success is determined, in part, by the available area of suitable substrate at settlement time.

The fisheries

Haddock are primarily caught by demersal trawlers (single, twin, and pair), and (to a lesser extent) by seiners. Haddock is a specific target for some fleets, but is also caught as part of a mixed fishery catching cod, whiting, and *Nephrops*. The minimum permitted mesh size for targeted fisheries was increased to 120 mm in 2002. Estimates of haddock bycatch in the industrial fishery are low, based on the assumption that bycatch rates remain as observed in recent years, when the industrial fisheries were at a low level.

Catch by fleet Total catch (2011) was 34.4 kt, where 75% were landings (86% demersal trawl and seine >100 mm, 11% *Nephrops* trawl 70–99 mm, and 3% others), 25% discards, and 0% industrial bycatch.

Effects of the fisheries on the ecosystem

Trawling impacts the benthos, as summarized in the North Sea ecosystem overview. Trawl gear are also relatively non-selective in terms of species caught, and trawl fisheries have a bycatch of non-commercial species that are important components of the North Sea ecosystem.

Quality considerations

The assessment and forecast are largely influenced by the 2005 and 2009 year classes. The overall reporting (in particular through the fully documented fisheries (FDF) programme) of catch data provided to ICES has improved in 2012. International landings and discard rate estimates were provided and raised according to the Data Collection Framework (DCF) métier categories.

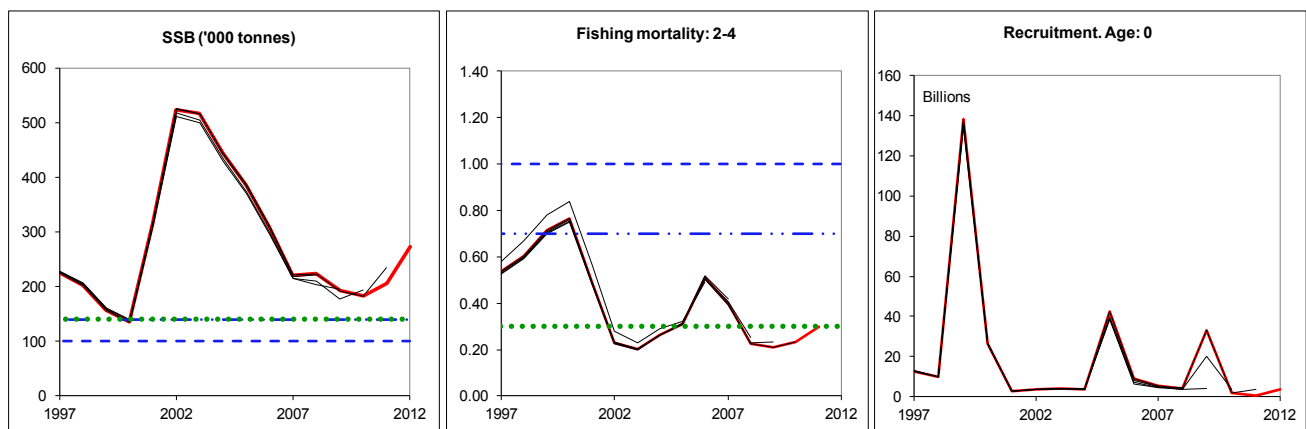


Figure 6.4.3.2 Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). Historical assessment results (final-year recruitment estimates included).

Scientific basis

Assessment type	Age-based analytical assessment (XSA).
Input data	Three survey indices: IBTS Q1, ScoGFS Q3, EngGFS Q3.
Discards and bycatch	Discards and industrial bycatch are included in the assessment.
Indicators	None.
Other information	Benchmarked in early 2011 (WKBENCH 2011).
Working group report	WGNSSK

6.4.3

Supporting information June 2012

ECOREGION **North Sea**
 STOCK **Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak)**

Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management Plan	F_{MP}	0.3	
	SSB_{MP}	100 000 t	Trigger value B_{lim} .
MSY Approach	$MSY B_{trigger}$	140 000 t	Default to value of B_{pa} .
	F_{MSY}	0.3	Provisional proxy is the management target F_{mgt} , within the range of fishing mortalities consistent with F_{MSY} (0.25–0.48).
Precautionary Approach	B_{lim}	100 000 t	Smoothed B_{loss} .
	B_{pa}	140 000 t	$B_{pa} = 1.4 * B_{lim}$.
	F_{lim}	1.0	$F_{lim} = 1.4 * F_{pa}$.
	F_{pa}	0.7	10% probability that $SSBMT < B_{pa}$.

(unchanged since: 2011)

Outlook for 2012

Basis: F (2012) = TAC constrained F = 0.196; SSB (2013) = 255; Human consumption landings (2012) = 42; Discards (2012) = 10; Industrial bycatch (2012) = 0; Recruitment (2012) = trimmed GM = 3604 million.

Rationale	Human consumption (2013)	Basis	F 2013	F HC 2013	F Disc 2013	F ind. Bycatch 2013	Discards 2013	Ind. Bycatch 2013	Catch 2013	SSB 2014	% SSB change ¹⁾	% TAC change ²⁾
Management plan	47.811	15% TAC increase	0.29	0.20	0.09	0.001	6	0	54	203	- 20%	+ 15%
MSY framework	49	F _{MSY}	0.30	0.21	0.09	0.001	6	0	55	202	- 21%	+ 17%
Precautionary approach	96	F _{pa}	0.70	0.48	0.22	0.001	12	0	108	144	- 43%	+ 130%
Zero catch	0	Zero catch	0.001	0	0	0.001	0	0	0	264	+ 4%	-100%
Other options	33	F ₂₀₁₂	0.20	0.13	0.06	0.001	4	0	38	221	-13%	-21%
	35.339	15% TAC decrease	0.21	0.14	0.07	0.001	4	0	40	219	- 14%	-15%
	42	Rollover TAC	0.25	0.17	0.08	0.001	5	0	47	211	- 17%	0%
	49	F ₂₀₁₂ *1.5	0.30	0.20	0.09	0.001	6	0	55	202	- 20%	+17%
<i>Mixed-fisheries options – minor differences with calculation above can occur due to different methodology used (ICES, 2012b)</i> □												
Maximum	56	A	0.46	NA	NA	NA	NA	NA	NA	145	- 43%	+ 34%
Minimum	25	B	0.14	NA	NA	NA	NA	NA	NA	231	- 10%	-39%
Cod MP	26	C	0.17	NA	NA	NA	NA	NA	NA	207	- 19%	- 36%
SQ effort	46	D	0.33	NA	NA	NA	NA	NA	NA	175	- 31%	+ 12%
Effort Mgt	27	E	0.17	NA	NA	NA	NA	NA	NA	217	- 15%	- 35%

Weights in thousand tonnes.

Under the assumption that effort is linearly related to fishing mortality.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Human Consumption 2013 relative to TAC 2012.

Mixed-fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted.
- B. Minimum scenario: Fleets stop fishing when first quota exhausted.
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted.
- D. *Status quo* (SQ) effort scenario: Effort in 2012 and 2013 as in 2011.
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans.

The landings in Division IIIa are calculated as 6% of the combined area total. The figure 6% has been used as the basis of the TAC split.

Management plan

In 2008 the EU and Norway agreed a revised management plan for this stock, which states that every effort will be made to maintain a minimum level of SSB greater than 100 000 t (B_{lim}). Furthermore, fishing was restricted on the basis of a TAC consistent with a fishing mortality rate of no more than 0.30 for appropriate age groups, along with a limitation on interannual TAC variability of $\pm 15\%$. Following a minor revision in 2008, interannual quota flexibility (“banking and borrowing”) of up to $\pm 10\%$ is permitted (although this facility has not yet been used). The stipulations of the management plan have been adhered to by the EU and Norway since its implementation in January 2007.

Following the management plan implies a TAC of 47 811 t in 2013, which is a TAC increase of 15% and is expected to lead to an F decrease of 8%.

MSY approach

Following the ICES MSY framework implies fishing mortality to be increased to 0.3, resulting in human consumption landings of less than 49 000 t in 2012. This would be expected to lead to an SSB of 202 000 t in 2014.

Precautionary approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to human consumption landings of less than 96 000 t in 2011. This is expected to keep SSB just above B_{pa} in 2014.

Mixed fisheries

In 2012, ICES puts forward mixed-fisheries advice for the first time (ICES, 2012b). In contrast to single-species advice there is no single recommendation but a range of plausible scenarios, assuming fishing patterns and catchability in 2012 and 2013 unchanged from those in 2011. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the TACs corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

The TAC for haddock in 2012 (15% reduction of the 2011 TAC) implies a reduction of fishing mortality in 2012 to 66% of the F in 2011 (which was at the level of the target of the management plan). This reduction means that the haddock TAC may act as a limiting factor in many fisheries in 2012.

In 2013, cod is the limiting species for all the North Sea demersal fisheries. Following the ‘cod’ scenario (full implementation of the cod management plan), the haddock management plan catch options could not be fully utilized.

Additional considerations

Adherence to the EU–Norway management plan has contributed to lower fishing mortality levels and greatly improved stability of yield. Discards are highly variable without obvious long-term trend but appear to be declining in recent years.

Within an ecosystem context, species-specific assessments and the latest developments in mixed-fisheries approaches need to be considered. A reduction in direct effort on one stock may lead to a reduction or an increase in effort on another and, hence, the implications of any changes need to be identified and carefully evaluated.

ICES has developed a generic approach to evaluate whether new survey information that becomes available in September forms a basis to update the advice. If this is the case, ICES will publish new advice in November 2012.

Management plan evaluations

The evaluations of the management plan that were carried out during 2007 and 2008 used a recruitment model which is thought to capture the sporadic nature of haddock recruitment. On this basis, a target $F = 0.3$ with TAC constraint $\pm 15\%$ leads to a low risk (<12% in any year) of $B < B_{lim}$ over the next 20 years, and a mean risk of 5% over all years. Lower Fs lead to lower risks. Interannual quota flexibility (banking and borrowing) has also been evaluated and it is concluded that this has no significant impact on sustainability.

ICES concludes that the management plan can be accepted as precautionary and can be used as the basis for advice.

Regulations and their effects

Effort restrictions in the EC were introduced in 2003 (annual annexes to the TAC regulations) for the protection of the North Sea cod stock. In 2009, the management programme switched from a days-at-sea to a kW-day system (2009 Council Regulation (EC) N°43/2009), in which different amounts of kW-days are allocated within each area by member state to different groups of vessels depending on gear and mesh size. Effort ceilings are updated annually.

Overall nominal effort (kW-days) by European demersal trawls, seines, beam trawls, and gillnets in the North Sea, Skagerrak, and Eastern Channel had been substantially reduced (–20% between 2003 and 2011). Following the introduction of days-at-sea regulations in 2003, there was a substantial switch from the larger mesh (>100 mm, TR1) gear to the smaller mesh (70–99 mm, TR2) gear. Subsequently, effort by TR1 has been relatively stable, whereas effort in TR2, beam trawl (80–120 mm, BT2), and gillnet has shown a continuous decline (–12%, –39%, and –35%, respectively, between 2004 and 2011). Nominal effort reported by Norway has increased in 2011 after the generalization of electronic logbooks (ICES, 2012b).

Scotland implemented in February 2008 a national scheme known as the ‘Conservation Credits Scheme’. The principle of this scheme involves additional time at sea in return for the adoption of measures (real-time closures and technical measures) which aim to reduce mortality on cod and lead to a reduction in discard numbers. In 2010 there were 165 closures, and from July 2010 the area of each closure increased (from 50 square nautical miles to 225 square nautical miles). During 2011 there were 185 of these larger closures. The effects of this regulation on the behaviour of the fleet and on the haddock stock are still unclear.

Changes in fishing technology and fishing patterns

The expansion of the closed-circuit TV (CCTV) and fully documented fisheries (FDF) programmes in 2010–2012 in Scotland, Denmark, and England is expected to have contributed to the reduction of cod mortality. Under this scheme, UK vessels are not permitted to discard any cod, while Danish vessels are still permitted to discard undersize cod. For both nations, all cod caught are counted against the quota. Vessels carrying CCTV systems may preferentially target haddock to prevent exhausting the cod quota and having to tie up.

Information from the fishing industry

The 2011 report of the North Sea Stock Survey (Napier, 2011) shows the industry’s perception of increasing haddock abundance in all areas of the North Sea in 2011. This does not concur with the stock assessment perception up to 2009. In the last two years both perceptions show an increasing trend.

Effect of the environment on the stock

Baudron *et al.* (2011) has suggested that haddock growth may be linked to temperature. Warmer waters lead to faster growth in early life stages, but also faster maturation and hence a lower maximum size. Water temperature in the North Sea has increased and Wright *et al.* (2011) shows that smaller size at maturity was partly linked to temperature rises and a greater proportion of haddock maturing at a younger age. Other ongoing work (unpublished, Marine Scotland) has indicated that haddock recruitment is only weakly linked to spawning-stock biomass, being more obviously determined by the area of available suitable substrate at settlement time.

Revisions in data and methodologies

The approach used to collate discard data has changed to conform with the EU Data Collection Framework (DCF), beginning with the 2009 data year. Direct comparisons with the previous method are not available, but analysis shows that the 2009 estimates are well within the range of recent variation. This suggests that the new collation method has not changed the perception of discard rates for haddock.

The overall reporting (in particular through the fully documented fisheries programme) of catch data provided to ICES has improved in 2012. International landings and discard rate estimates were provided and raised according to Data Collection Framework (DCF) metier categories.

Uncertainties in assessment and forecast

The assessment is sensitive to the estimation of a few large cohorts, so the variability in estimates among assessment years is to be expected. There are no indications of assessment bias.

Uncertainties in the forecast are related to the assumption on intermediate year F, which implies a 66% reduction of F in 2012.

Comparison with previous assessment and advice

There is close agreement between the assessments in 2011 and 2012.

The basis for the advice is the same as last year: the agreed management plan.

Assessment and management area

The advice for this stock is given for Subarea IV (North Sea) and Division IIIaN (Skagerrak), while the TACs for this stock are set for Division IIa (EU waters) and Subarea IV, and the whole of Subarea III, respectively.

Sources

- Baudron, A. R., Needle, C. L. and Marshall, C. T. 2011. Implications of a warming North Sea for the growth of haddock *Melanogrammus aeglefinus*. ICES Journal of Marine Science. doi:10.1111/j.1095-8649.2011.02940.x.
- ICES. 2009. Report of the Working Group on Methods of Fish Stock Assessment (WGMG), 20–29 October 2009, Nantes, France. ICES CM 2009/RMC:12. 85 pp.
- ICES. 2011. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 4–10 May 2011. ICES CM 2011/ACOM:13.
- ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 27 April–10 May 2012. ICES CM 2012/ACOM:13.
- ICES. 2012b. Report of the Working Group on Mixed Fisheries Advice for the North Sea (WGMIXFISH), 21–25 May 2012. ICES CM 2012/ACOM:22.
- Jaworski, A. 2011. Evaluation of methods for predicting mean weight-at-age: an application in forecasting yield of four haddock (*Melanogrammus aeglefinus*) stocks in the Northeast Atlantic. ICES Journal of Marine Science, doi:10.1016/j.fishres.2011.01.017.
- Napier, I. R. 2011. Fishers' North Sea stock survey 2011. NAFC Marine Centre, Shetland, Scotland.
- Needle, C. L., and Catarino, R. 2011. Evaluating the effect of real-time closures on cod targeting. ICES Journal of Marine Science, 68: 1647–1655.
- STECF. 2011. Report of the SGMOS-10-05 Working Group on Fishing Effort Regimes Regarding Annexes IIA, IIB and IIC of TAC & Quota Regulations, Celtic Sea and Bay of Biscay. Edited by Nick Bailey and Hans-Joachim Rätz. 27 September–1 October 2010, Edinburgh, Scotland.
- Wright, P. J., Gibb, F. M., Gibb, I. M., and Millar, C. P. 2011. Reproductive investment in the North Sea haddock: temporal and spatial variation. Marine Ecology Progress Series, 432: 149–160.

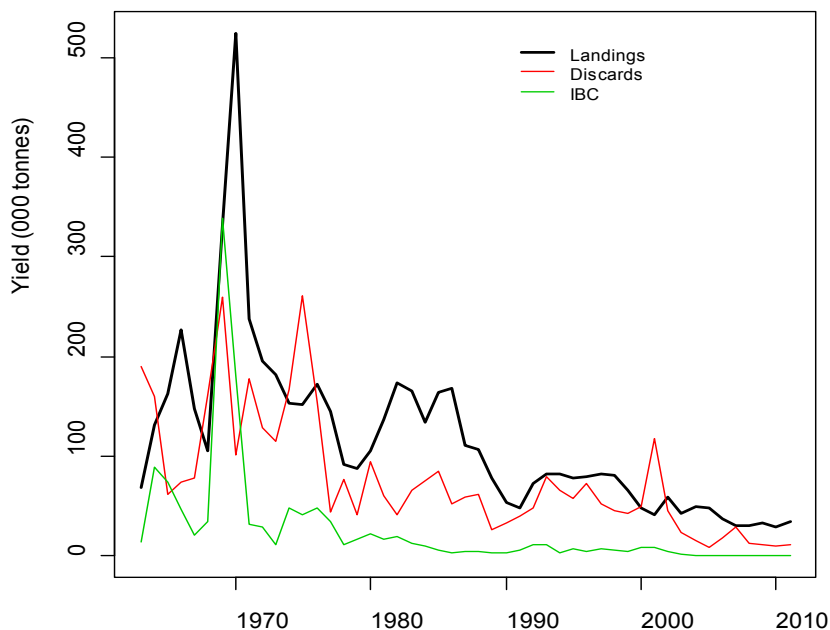


Figure 6.4.3.3 Haddock in Subarea IV (North Sea) and Division IIIaW (Skagerrak). Catch components (in '000 t) subdivided by landings, discards, and industrial bycatches (IBC).

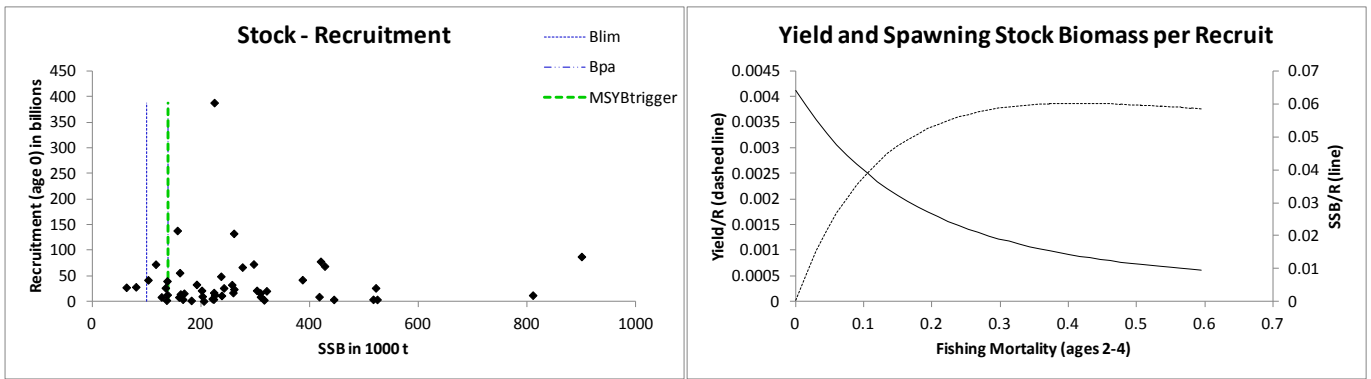


Figure 6.4.3.4 Haddock in Subarea IV (North Sea) and Division IIIaW (Skagerrak). Stock–recruitment (left) and yield-per-recruit plot (right).

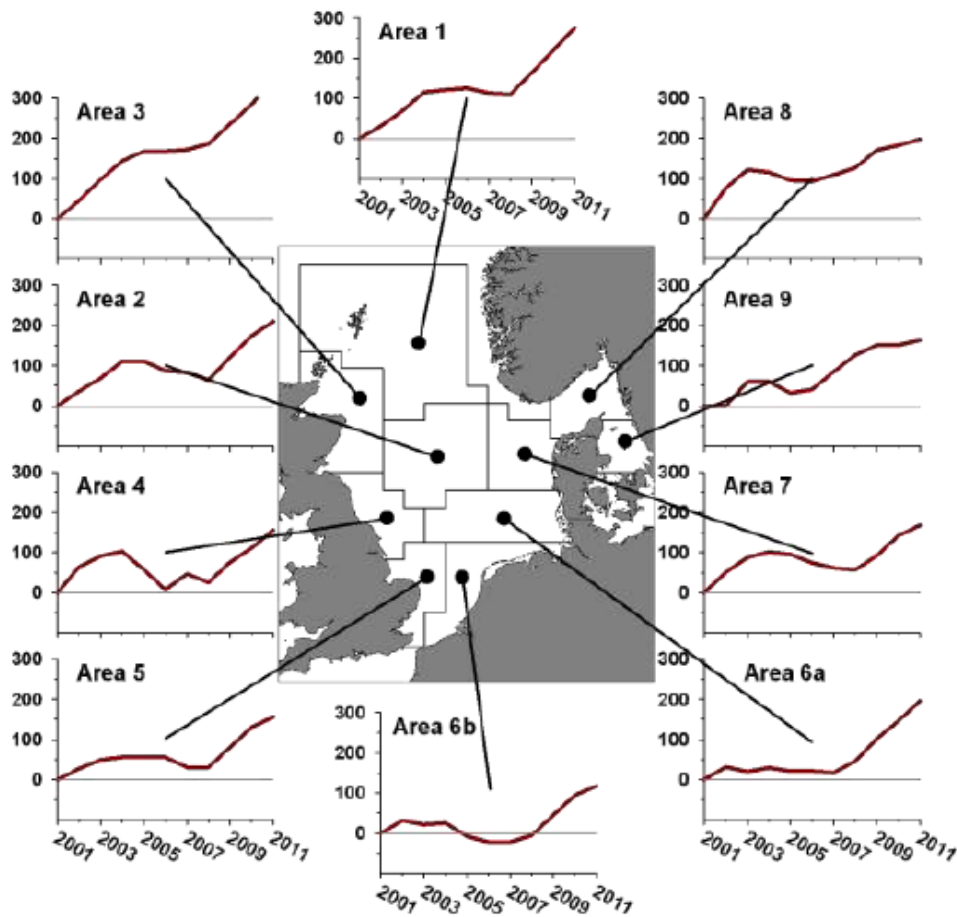


Figure 6.4.3.5 Haddock in Subarea IV and Division IIIa. Results of the 2011 North Sea Stock Survey abundance index (Napier, 2011). Each plot presents a summary of the responses by North Sea roundfish reporting area.

Table 6.4.3.1 Haddock in Subarea IV (North Sea). ICES advice, management, and catch.

Year	ICES Advice	Predicted landings corresp. to advice	Agreed TAC	Off. Indgs.	ICES catches			
					Hum. Cons.	Disc Slip.	Indust. bycatch	Total
1987	80% of F(85)	105	140	109	108	59	4	172
1988	77% of F(86); TAC	185	185	105	105	62	4	171
1989	Reduce decline in SSB; TAC; protect juveniles	68	68	64	76	26	2	104
1990	80% of F(88); TAC	50	50	43	51	33	3	87
1991	70% of effort (89)		50	45	45	40	5	90
1992	70% of effort (89)		60	51	70	48	11	129
1993	70% of effort (89)		133	80	80	80	11	170
1994	Significant reduction in effort; mixed fishery		160	87	81	65	4	150
1995	Significant reduction in effort; mixed fishery		120	75	75	57	8	140
1996	Mixed fishery to be taken into account		120	75	76	73	5	154
1997	Mixed fishery to be taken into account		114	73	79	52	7	138
1998	No increase in F	100.3	115	72	77	45	5	128
1999	Reduction of 10% F(95–97)	72	88.6	64	64	43	4	111
2000	F less than F_{pa}	<51.7	73.0	47	45	47	8	100
2001	F less than F_{pa}	<58.0	61	40	39	118	8	165
2002	F less than F_{pa}	<94.0	104.0	54	53	45	4	101
2003	No cod catches	-	52	42	42	23	1	76
2004	Mixed-fisheries consideration / F should be below F_{pa}	No forecast ²	85	48	47	17	1	65
2005	Mixed-fisheries consideration / F should be below F_{pa}	92 ²	66	31	48	10	0	57
2006	Mixed-fisheries consideration / $F < 0.3$	39 ²	52	36	36	17	0	55
2007	Mixed-fisheries consideration / $F < 0.3$	55.4 ²	55	31	31	30	0	61
2008	Mixed-fisheries consideration / 15% TAC reduction	49.3 ¹⁻²	46	30	29	13	0	42
2009	Mixed-fisheries consideration / Apply management plan	44.7 ¹⁻²	42	31	31	10	0	41
2010	Mixed-fisheries consideration / Apply management plan	38 ¹⁻²	36	28	28	10	0	38
2011	See scenarios	-	34	26	34	11	0	46
2012	Apply management plan	41.575 ¹⁻²	39					
2013	Apply management plan	47.811 ¹⁻²						

Weights in thousand tonnes.

¹ Including industrial bycatch.² The exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

Table 6.4.3.2 Haddock in **Division IIIaW (Skagerrak)**. ICES advice, management, and landings.

Year	ICES Advice	Predicted landings corresp. to advice	Agreed TAC	ICES Catches			
				Hum. Cons.	Disc Slip.	Indust. bycatch	Total
1987	Precautionary TAC	-	11.5	3.8		1.4	5.3
1988	Precautionary TAC	-	10.0	2.9		1.5	4.3
1989	Precautionary TAC	-	10.0	4.1		0.4	4.5
1990	Precautionary TAC	-	10.0	4.1		2.0	6.1
1991	Precautionary TAC	4.6	4.6	4.1		2.6	6.7
1992	TAC	4.6	4.6	4.4		4.6	9.0
1993	Precautionary TAC	-	4.6	2.0		2.4	4.4
1994	Precautionary TAC	-	10.0	1.8		2.2	4.0
1995	If required, precautionary TAC; link to North Sea	-	10.0	2.2		2.2	4.4
1996	If required, precautionary TAC; link to North Sea	-	10.0	3.1		2.9	6.1
1997	Combined advice with North Sea	-	7.0	3.4		0.6	4.0
1998	Combined advice with North Sea	4.7	7.0	3.8		0.3	4.0
1999	Combined advice with North Sea	3.4	5.4	1.4		0.3	1.7
2000	Combined advice with North Sea	<1.8	4.5	1.5		0.6	2.1
2001	Combined advice with North Sea	<2.0	4.0	1.9		0.2	2.1
2002	Combined advice with North Sea	<3.0	6.3	4.1		0.06	4.1
2003	Combined advice with North Sea	-	3.2	1.8	0.2	n/a	1.8
2004	Combined advice with North Sea / F should be below F_{pa}	No forecast	4.9	1.4	0.1	n/a	1.4
2005	Combined advice with North Sea / F should be below F_{pa}	-	4.0	0.8	0.2	0	0.8
2006	Combined advice with North Sea / $F < 0.3$	-	3.2	1.5	1.0	0	1.5
2007	Combined advice with North Sea / $F < 0.3$	-	3.4	1.6	0.8	0	2.5
2008	Combined advice with North Sea / 15% TAC reduction	2.9	2.9	1.4	0.6	0	2.0
2009	Combined advice with North Sea / Apply management plan	-	2.6	1.5	0.6	0	2.1
2010	Combined advice with North Sea / Apply management plan	-	2.2	1.3	0.6	0	1.9
2011	See scenarios	-	2.1	9.9	1.7	0	11.6
2012	Apply management plan North Sea	-	2.4				
2013	Apply management plan North Sea	-					

Weights in thousand tonnes.

n/a = not available.

Table 6.4.3.3 Haddock in Subarea IV (North Sea) and Division IIIaW (Skagerrak). Landings and catches by country and area.

Country	Division	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Belgium	III a	0	0	0	0	0	0	0	0		
Denmark	III a	3791	1741	1116	615	1001	1054	1052	1263	1139	1648
Germany	III a	239	113	69	69	186	206	87	105	65	
Netherlands	III a	0	6	1	0	0	0	0	0	1	
Norway	III a	149	211	154	93	113	152	170	121	125	
Portugal	III a	0	0	0	0	30	37	0	0		
Sweden	III a	393	165	158	180	246	278	276	166	126	193
UK -E+W+NI	III a	0	0	0	0	0	0	0	0	0	
UK - Scot	III a	0	0	0	0	0	0	0	0	0	
Official landings	III a	4572	2236	1498	957	1576	1727	1585	1655	1456	1841
WG landings	III a	4137	1808	1443	764	1537	1515	1374	1515	1287	9850
WG discards	III a		195	112	217	970	816	646	556	608	1744
WG total catch	III a	4137	2003	1555	981	2507	2332	2020	2072	1896	11595
TAC	III a	6300	3150	4940	4018	3189	3360	2856	2590	2201	2095
Belgium	IV	559	374	373	190	105	179	113	108	78	105
Denmark	IV	5123	3035	2075	1274	759	645	501	553	725	698
Faeroe Islands	IV	25	12	22	22	4	0	3	32	5	
France	IV	914	1108	552	439	444	498	448	125	277	237
Germany	IV	852	1562	1241	733	725	727	393	657	634	575
Netherlands	IV	359	187	104	64	33	55	29	24	41	72
Norway	IV	2404	2196	2258	2089	1798	1706	1482	1278	1119	1188
Poland	IV	17	16	0	0	8	8	16	0	0	
Portugal	IV	0	0	0	0	76	0	0	0		
Sweden	IV	572	477	188	135	100	130	83	141	90	128
UK - E+W+NI	IV	3647	1561	1159	651	485	1799	1378	2155	2362	
UK – Scot	IV	39624	31527	39339	25319	31905	24919	25987	26238	22622	
UK – all	IV									24984	22648
Official landings	IV	54096	42055	47311	30916	36442	30666	30433	31311	27953	25651
WG landings	IV	54171	40140	47253	47616	36074	29418	28893	31264	27770	26275
WG discards	IV	45892	23499	15439	8416	16943	27805	12532	9986	9515	10249
WG IBC	IV	3717	1150	554	168	535	48	199	52	431	23
WG total catch	IV	103780	64788	63246	56200	53551	57271	41624	41302	37717	36547
TAC	IV	104000	51735	77000	66000	51850	54640	46444	42110	35794	34057
WG landings	IV & IIIa	58308	41948	48697	48380	37611	30934	30267	32779	29058	36125
WG discards	IV & IIIa	45892	23694	15550	8633	17913	28621	13178	10543	10124	11993
WG IBC	IV & IIIa	3717	1150	554	168	535	48	199	52	431	23
WG total catch	IV & IIIa	107917	66792	64800	57181	56058	59603	43644	43374	39612	48141
TAC	IV & IIIa	110300	54885	81940	70018	55039	58000	49300	44700	37995	36152
WG quota uptake		53%	76%	59%	69%	68%	53%	61%	73%	76%	100%

Table 6.4.3.4 Haddock in Subarea IV (North Sea) and Division IIIaW (Skagerrak). Summary of stock assessment.

	Recruitment Thousands	TSB tonnes	SSB tonnes	Catch tonnes	Landings tonnes	Discards tonnes	Bycatch Tonnes	Yield/SSB	F(2-4)
1963	2314960	3412683	137050	271851	68821	189330	13700	0.502	0.745
1964	9155375	1281817	417713	379915	131006	160309	88600	0.314	0.794
1965	26286881	1080997	521738	299343	162418	62325	74600	0.311	0.639
1966	68923158	1480495	427838	346349	226184	73465	46700	0.529	0.662
1967	388351133	5527447	224790	246664	147742	78222	20700	0.657	0.626
1968	17114813	6852013	259397	301821	105811	161810	34200	0.408	0.597
1969	12133861	2477679	810544	930043	331625	260065	338353	0.409	1.121
1970	87605720	2541768	900221	805776	524773	101274	179729	0.583	1.152
1971	78203289	2546401	420401	446824	237502	177776	31546	0.565	0.773
1972	21425991	2182179	302976	353084	195545	127954	29585	0.645	1.119
1973	72938535	4087838	297147	307594	181592	114735	11267	0.611	0.866
1974	132845377	4710721	260752	366992	153057	166429	47505	0.587	0.962
1975	11406566	2385147	238279	453205	151349	260370	41487	0.635	1.102
1976	16397329	1097473	309487	375305	172680	154462	48163	0.558	0.973
1977	26203002	1069043	242297	224516	145118	44376	35022	0.599	1.033
1978	39808657	1137542	138098	179375	91683	76789	10903	0.664	1.062
1979	72620594	1352096	117086	145019	87069	41710	16240	0.744	0.987
1980	15795472	1470716	169227	222127	105041	94614	22472	0.621	0.899
1981	32606103	996405	257248	213240	136132	60067	17041	0.529	0.659
1982	20488195	1091776	320939	233283	173335	40564	19383	0.54	0.659
1983	66943546	2253195	276470	244212	165337	65977	12898	0.598	0.884
1984	17180273	1690885	224030	218946	133568	75298	10080	0.596	0.873
1985	23917418	1188181	261091	255366	164119	85249	5998	0.629	0.872
1986	49002387	1941134	237140	223081	168236	52203	2643	0.709	1.203
1987	4154844	1097088	166839	173852	110299	59143	4410	0.661	1.024
1988	8337202	630204	159929	173124	106973	62148	4002	0.669	1.108
1989	8604153	623382	127707	106526	78439	25677	2410	0.614	0.952
1990	28334295	1581748	80676	88934	53780	32565	2589	0.667	1.114
1991	27456974	1551974	63074	93287	47715	40185	5386	0.756	0.888
1992	41943346	1363931	103105	131650	72790	47934	10927	0.706	0.98
1993	13122801	1018311	138475	172551	82176	79609	10766	0.593	0.896
1994	55983396	1485103	161327	151020	82074	65370	3576	0.509	0.83
1995	14292721	1170059	162662	142524	77458	57371	7695	0.476	0.733
1996	21442638	1058031	201674	156609	79148	72461	5000	0.392	0.688
1997	12752842	975541	225758	141347	82574	52089	6684	0.366	0.537
1998	9957388	791581	202849	131316	81054	45160	5101	0.4	0.604
1999	138417502	3673171	156880	112021	65588	42598	3835	0.418	0.714
2000	26490420	3556209	135081	104457	47553	48770	8134	0.352	0.765
2001	2843508	1236908	316340	166960	40856	118225	7879	0.129	0.492
2002	3727538	896641	524367	107923	58348	45857	3717	0.111	0.229
2003	3898976	781120	517010	66805	41964	23691	1150	0.081	0.201
2004	3716574	775860	444700	64839	48734	15551	554	0.11	0.263
2005	42319097	2836645	386936	57162	48357	8637	168	0.125	0.31
2006	9031849	1422690	310074	56056	37613	17908	535	0.121	0.511
2007	5287388	775740	221317	59643	30939	28657	48	0.14	0.398
2008	4293403	605339	223563	43640	30248	13193	199	0.135	0.227
2009	33107554	1950891	192276	43407	32807	10548	52	0.171	0.209
2010	1794179	633149	182559	39640	29054	10155	431	0.159	0.233
2011	680950	415673	205468	46378	34840	11515	23	0.170	0.298
2012	3604000		272592						

Annex 6.4.3 EU and Norway Management plan

“The plan shall consist of the following elements:

- 1. Every effort shall be made to maintain a minimum level of Spawning Stock Biomass greater than 100,000 tonnes (Blim).*
- 2. For 2009 and subsequent years the Parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate of no more than 0.3 for appropriate age-groups, when the SSB in the end of the year in which the TAC is applied is estimated above 140,000 tonnes (Bpa).*
- 3. Where the rule in paragraph 2 would lead to a TAC, which deviates by more than 15 % from the TAC of the preceding year, the Parties shall establish a TAC that is no more than 15 % greater or 15 % less than the TAC of the preceding year.*
- 4. Where the SSB referred to in paragraph 2 is estimated to be below Bpa but above Blim the TAC shall not exceed a level which will result in a fishing mortality rate equal to $0.3-0.2*(Bpa-SSB)/(Bpa-Blim)$. This consideration overrides paragraph 3.*
- 5. Where the SSB referred to in paragraph 2 is estimated to be below Blim the TAC shall be set at a level corresponding to a total fishing mortality rate of no more than 0.1. This consideration overrides paragraph 3.*
- 6. In the event that ICES advises that changes are required to the precautionary reference points Bpa (140,000t) or Blim, (100,000t) the Parties shall meet to review paragraphs 1-5.*
- 7. In order to reduce discarding and to increase the spawning stock biomass and the yield of haddock, the Parties agreed that the exploitation pattern shall, while recalling that other demersal species are harvested in these fisheries, be improved in the light of new scientific advice from inter alia ICES.*
- 8. No later than 31 December 2010, the parties shall review the arrangements in paragraphs 1 to 7 in order to ensure that they are consistent with the objective of the plan. This review shall be conducted after obtaining inter alia advice from ICES concerning the performance of the plan in relation to its objective.*
- 9. This arrangement enters into force on 1 January 2009.”*