

## 8.4.2 Cod in Subdivisions 25–32

### State of the stock

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to highest yield	Fishing mortality in relation to agreed target	Comment
Undefined	Harvested sustainably	Appropriate	Below target	EU management plan implemented in 2008 with a target fishing mortality of 0.3.

In the absence of applicable biomass reference points (BRPs), the state of the stock cannot be evaluated with regards to such BRPs. SSB in 2008 was still at low level (139 000 t), but was twice as high as in 2005 (66 000 t). F in 2008 was estimated to be 0.24, lower than the agreed target fishing mortality rate (F=0.3). The 2005 and 2006 year classes (at age 2) are the strongest year classes in 20 years; i.e. since the 1985 year class.

### Management objectives

The EC has agreed on a management plan for cod in the Baltic Sea in September 2007 (see Annexed text). For Eastern Baltic cod, the goal of the plan is a fishing mortality rate no higher than 0.3.

ICES interprets the F for the preceding year as the estimate of F for the year in which the assessment is carried out (i.e. the intermediate year). The plan specifies a 10% reduction in total fishing days at sea per year until the target F has been reached. In the ICES evaluation of this plan, this is also interpreted as a 10% reduction on F in the intermediate year assuming a constant fleet catchability. The plan sets a maximum change of 15% of the TAC between consecutive years, unless the fishing mortality is estimated to be higher than 0.6. In this latter case the TAC shall be set in correspondence to the reduction of fishing mortality by 10%. ICES has evaluated the management plan in 2009 and considers it to be in accordance with the precautionary approach. The evaluation is most sensitive to assumptions about implementation error; i.e. TAC and effort overshoot.

### Reference points

	Type	Value	Technical basis
Precautionary approach	$B_{lim}$	Not defined*	
	$B_{pa}$	Not defined*	
	$F_{lim}$	0.96	F <sub>med</sub> (estimated in 1998)
	$F_{pa}$	0.60	5th percentile of F <sub>med</sub>
Targets	$F_v$	0.3-0.4	AGLTA 2005, WKREFBAS 2008, simulations
	$F_{mgt}$	0.3	EU management plan 2007

(changed in 2008)

\* A recent integrated ecosystem assessment (ICES CM 2008/BCC:04) shows a major shift in food web composition and in environmental drivers in the Central Baltic basin, and therefore previously defined biomass reference points are considered not applicable and were not used in assessing stock status or advice.

### Yield and spawning biomass per Recruit

F-reference points (2009):

	Fish Mort Ages 4–7	Yield/R	SSB/R
Average last 3 years	0.53	0.60	1.22
$F_{max}$	0.25	0.67	2.77
$F_{0.1}$	0.15	0.63	4.20
$F_{med}$	0.69	0.56	0.89

## Single-stock exploitation boundaries

### Conclusion on exploitation boundaries

The management plan is in accordance with the precautionary approach and ICES advises in the framework of this plan. This approach corresponds to a TAC of 56 800 t in 2010.

### Exploitation boundaries in relation to existing management plan

F in 2008 was below 0.3 which is as the target fishing mortality in the EU management plan. However, the EU management plan limits the change of TACs between consecutive years to a 15% increase of the total TAC (EU + Russia). Given the 2009 TAC of 49 380 t, this results in a TAC of 56 800 t in 2010.

### Exploitation boundaries in relation to high long-term yield, low risk of depletion of production potential, and considering ecosystem effects

ICES has previously recommended a target fishing mortality of  $F=0.3$  as this would result in a low risk to depletion and high long-term yields. Such a fishing mortality corresponds to landings of 98 200 t and a total catch of 101 100 t in 2010.

### Exploitation boundaries in relation to precautionary limits

Fishing below  $F_{pa}$  in 2010 corresponds to landings of less than 180 700 t and a total catch of less than 186 200 t.

## Short-term implications

### Outlook for 2010

Basis:  $F(2009) = F_{sq} = \text{mean } F(2006-08)$  rescaled to 2008 = 0.242;  $SSB(2010) = 324.3\text{kt}$ ; Landings (2009) = 61.7kt; Discards (2009) = 3.3kt<sup>5)</sup>.

Rationale	Landings (2010) <sup>1)</sup>	Basis	Total F (2010)	F Landings (2010) <sup>1)</sup>	F Discards (2010)	Discards (2010)	Total Catch (2010) <sup>1)</sup>	SSB (2011)	%SSB change <sup>2)</sup>	%TAC change <sup>3)</sup>
Zero catch	0.0	$F=0$	0.00	0.00	0.000	0.00	0.0	469.2	45%	-100%
Status quo	17.6	$F_{sq} * 0.2$	0.05	0.05	0.001	0.50	18.1	449.4	39%	-64%
	42.6	$F_{sq} * 0.5$	0.12	0.12	0.001	1.22	43.8	421.4	30%	-14%
	62.1	$F_{sq} * 0.75$	0.18	0.18	0.002	1.80	63.9	399.6	23%	26%
	73.4	$F_{sq} * 0.9$	0.22	0.21	0.002	2.13	75.5	387.1	19%	49%
	80.7	$F_{sq} * 1$	0.24	0.24	0.003	2.36	83.0	378.9	17%	63%
	98.2	$F_{sq} * 1.25$	0.30	0.30	0.003	2.90	101.1	359.4	11%	99%
	114.8	$F_{sq} * 1.5$	0.36	0.36	0.004	3.43	118.2	341.0	5%	133%
	130.5	$F_{sq} * 1.75$	0.42	0.42	0.005	3.94	134.5	323.7	0%	164%
	145.5	$F_{sq} * 2$	0.48	0.48	0.005	4.44	149.9	307.2	-5%	195%
Precautionary limits	21.7	$F(pa) * 0.1$	0.06	0.06	0.001	0.61	22.3	444.8	37%	-56%
	52.2	$F(pa) * 0.25$	0.15	0.15	0.002	1.50	53.7	410.7	27%	6%
	97.7	$F(pa) * 0.5$	0.30	0.30	0.003	2.88	100.6	360.0	11%	98%
	137.4	$F(pa) * 0.75$	0.45	0.45	0.005	4.17	141.6	316.1	-3%	178%
	162.6	$F(pa) * 0.9$	0.54	0.53	0.006	4.96	167.6	288.1	-11%	229%
	180.7	$F_{pa} = F_{sq} * 2.61$	0.60	0.59	0.007	5.52	186.2	268.0	-17%	266%
	198.8	$F(pa) * 1.1$	0.66	0.65	0.007	6.07	204.8	247.9	-24%	303%
	225.9	$F(pa) * 1.25$	0.75	0.74	0.008	6.89	232.8	217.7	-33%	357%
271.1	$F(pa) * 1.5$	0.90	0.89	0.010	8.27	279.3	167.4	-48%	449%	
Management plan	56.8	+15% TAC deviation <sup>4)</sup>	0.16	0.16	0.002	1.64	58.4	405.6	25%	15%

Weights in '000 t. Shaded scenarios are not considered consistent with the precautionary approach.

<sup>1)</sup> Landings are total catch without discards. If this figure is taken as TAC, no implementation error is assumed.

<sup>2)</sup> SSB (2011) relative to SSB (2010).

<sup>3)</sup> TAC 2010 relative to TAC 2009.

<sup>4)</sup> TAC in 2009 equals EU 44.580 kt + Russia 4.800 kt = 49.380 kt.

<sup>5)</sup> Discards proportions in the projections were assumed to be the average proportions discarded per age in 2006–2008 (fishing pattern partitioned in landings and discards and scaled to 2008).

## **Management considerations**

Landings of 56 800 t in 2010 are expected to be associated with discards of 1 640 t. This catch corresponds to  $F = 0.16$  for 2010.

Following the management plan,  $F$  in 2010 is predicted to be at 0.16 which is 67% of  $F$  estimated for 2009. No effort reduction is required according the management plan, as  $F$  in both 2009 and 2010 are predicted to be below the target  $F$  of 0.3. This leads to a discrepancy between available effort and catching opportunities. In addition the 2005 and 2006 year classes appear to be strong. These factors may lead to an increased risk for highgrading and discarding. With the stronger 2006 year class entering the fishery in 2009, discards are likely to increase above the level predicted. In this situation, ICES recommends to implement measures to improve the selectivity of fishing gear, e.g. by increasing the mesh size.

In 2008 the available information suggests that unreported landings were only 6% while unallocated landings are estimated to be at least within the range of 30–40% of official annual landings 2000–2006. Actions are in progress to improve enforcement and control (Copenhagen declaration on combating unreported cod fishery in the Baltic Sea, 28 March 2007). Unallocated catches have been included in the assessment, and the advice also refers to the total landings. The advised landings from the forecasts can only be directly translated into TACs if a stop of illegal landings is implemented. In view of the uncertainty about the 2008 catch and the sensitivity to assessment assumptions, the estimated  $F$  for 2008 is considered to be rather uncertain, but there is strong support for a declining trend in  $F$ . It will take a few years to be confident that fishing mortality has actually declined to the extent indicated in this assessment.

Precautionary biomass reference points for this stock were established in 1998. A recent integrated ecosystem assessment showed a major shift in food web composition and abiotic drivers in the Central Baltic basin. This indicates that the biomass reference points might be outdated and are therefore not used in the current stock classification and advice. This calls into question the applicability of the current  $F$  reference points but preliminary analysis indicates that they are less sensitive to observed ecosystem change than biomass reference points. Thus, the current  $F$  reference points are provisionally retained.

Removals of cod in recreational fisheries in the Baltic have been indicated by an EU pilot study finalized in 2007. These catches are currently not consistently and completely sampled, and therefore not included in the assessment.

### *Management plan evaluations*

ICES has evaluated the EC management plan in March 2009 and concluded that this management plan is in accordance with the precautionary approach. During the evaluation ICES assumed that the annual effort reduction is fully achieved until the target  $F$  is achieved. The plan appeared to be most sensitive against implementation error, i.e. TAC or effort overshoot. Provided this implementation error is unbiased (i.e. no systematic misreporting) and below 10%, the stock is likely to rebuild to regain full reproduction potential before 2015 applying the plan in its current design. In the past, with the exception of 2008, the implementation error has not been insignificant.

## **Factors affecting the fisheries and the stock**

### *Regulations and their effects*

The stock is managed through TAC, effort, and seasonal fisheries restrictions.

The EC Council Regulation for the Baltic TAC and quota 2009 involves reductions in the effort in terms of number of fishing days per year, resulting in a maximum 160 days of fishing in Subdivisions 25–28.2 in 2009. There has been extensive underreporting of catches. However, this situation is believed to have improved in 2008.

The cod fisheries in the Eastern Baltic are also regulated by a seasonal closure during 1 July to 31 August to protect spawning fish.

A closure of a central part of the main spawning area in the Bornholm Deep has been implemented and enforced during the main spawning seasons since the mid-1990s for all fisheries. A year-round area closure for all fisheries in specific areas of the Bornholm Deep, the Gotland Basin, and the Gdansk Deep was introduced in 2005 aimed at reducing fishing mortality.

Since 2006, area closures have been enforced from 1 May to 31 October.

All of these measures have contributed to the marked decline in the fishing mortality on this stock.

A 'Bacoma' codend with a 120-mm mesh was introduced by IBSFC in 2001 in parallel to an increase in diamond mesh size to 130 mm in traditional codends. The expected effect of introducing the Bacoma 120-mm exit window was nullified by compensatory measures in the industry. This was to some extent explained by the mismatch between the selectivity of the 120-mm Bacoma trawl and the minimum landing size. In October 2003, the regulation was changed to a 110-mm Bacoma window. This was expected to enhance the compliance and to be in better accordance with the minimum landing size.

#### *Changes in fishing technology and fishing patterns*

Cod in the Eastern Baltic are taken primarily by trawlers and gillnetters. There was a substantial increase in the use of gill nets in the 1990s. In 2008, gillnet and longline catches accounted for about 30% of the total catch.

#### *Impact of the environment on the fish stock*

Spawning is confined to the deep basins where the water is of a sufficiently high oxygen content and salinity for eggs to survive. The amount of water with these characteristics depends on the inflow of high salinity water from the North Sea. The high cod recruitment during the mid-1970s reflected a relatively high frequency of major inflows of high salinity water from the North Sea, leading to high oxygen concentrations in the cod spawning areas and hence to high egg survival and good recruitment. Since the mid-1980s, there have been few major inflows from the North Sea, leading to poor conditions for egg survival, and much reduced recruitment. A reduction in the size of potential spawning areas in the Central Eastern Baltic has also been noted. Successful spawning now only occurs in the Bornholm Basin. Therefore, the stock may not rebuild to historic high levels unless the hydrographic conditions improve. The reduced salinity has led to reduced abundance of the main larval food of cod, the copepod *Pseudocalanus* sp. An inflow in 1993 led to some improvement in egg survival, but this did not result in improved recruitment as larval survival was limited by food supply at this time. A major inflow in early 2003 led to a substantial increase in the volume of water suitable for cod egg survival, which is consistent with the appearance of a relatively strong 2003, 2005 and 2006 year classes (compared to the past 20 years) in BITS surveys.

Cod is the major predator on herring and sprat, and the stock size of cod therefore determines the natural mortality on these populations. The expected increase in the cod stock may therefore lead to an increased mortality on these small pelagic species.

### **Scientific basis**

#### *Data and methods*

The assessment is based on commercial landings and discards data, one commercial CPUE index, and two survey indices. The longest survey series has a break in 2001 when the survey design was altered.

Substantial underreporting of catches occurred in 1993–1996, and also from 2000 onwards. In this situation, ICES have chosen to include mis- and non-reported landings in the assessment.

Estimates of the amount of misreporting are available from the national industries and control agencies and indicate that total catches during 2000–2007 were about 32–45% higher than the reported figures. By nature this information is highly uncertain and incomplete and no data are available for some countries where misreporting is suspected to occur. ICES considers that in 2008 the enforcement of fishing control led to significant reduction of non-reporting; the available information suggests that unreported landings in 2008 were only 6% of the reported landings. Although the adjusted landings values derived by ICES are the best possible estimates, they are likely to be minimum estimates.

Discard data have been available since 1996 and are applied in the assessment as yearly proportions discarded per age-group. Before 1996, an average proportion discarded per age-group estimated for 1996–2003 was applied. From 2004 onwards, annual estimates of discards have been derived from the biological sampling of catches. The season and area coverage of discard sampling still requires improvement. Due to changes in technical regulations (e.g. increase in minimum landing size; the introduction of different codend sizes; and various fishery closures), discard rates have been variable.

#### *Information from the fishing industry*

Some of the information on mis- and underreporting came from industry sources, indicating that the estimates used in the assessment are minimum values.

### *Uncertainties in assessment and forecast*

Uncertainties in assessment are mainly due to problems with underreporting, discarding, and age-reading. The estimate of F in 2008 is highly uncertain because of the probable underestimation of total landings in 2008.

The estimate of total F depends on the amount of official and nonreported catches as well as on discards. Information on nonreporting for 2008 was available only from some countries. This information resulted in catches that were 6% higher than reported figures, in contrast to the period 2000–2007 when annual discards were around 32–45%. Information on nonreported catches is highly uncertain, and therefore the estimate of F in 2008 is also highly uncertain.

Sampling for discards is insufficient and raising procedures have been problematic in the recent past. This led to revisions in this year's assessment of the strength of incoming year classes this year. Additionally, assumptions had to be made on the levels of discards of illegal catches. Predicted discards for 2010 are based on the 2008 values, and these are likely to be minimum estimates as discards are likely to be higher in the 2009 fishery as the strong 2006 year-class begins to enter the fishery.

Large inconsistencies exist in age determinations for the Eastern Baltic cod stock owing to the lack of clear growth rings in the otoliths. In 2008, the quantity of landings with no age information was very high (28%). This results in poor quality catch-at-age and survey data, and a likely underestimation of fishing mortality. ICES attempted to resolve the inconsistencies in age determinations for this stock, but no consensus was reached on the age determinations. An EU-funded study initiated in 2007 (project DECODE) will take a different approach to deliver validated aging data for the assessment.

The problems with the catch and survey data and inconsistent age determinations make it difficult to precisely determine the strengths of the 2005 and 2006 year-classes. The 2006 year-class could make a major contribution to the catch in 2010 and the spawning stock in 2011. As such, the catch and SSB forecasts are sensitive to the estimated strength of this year class.

### **Environmental conditions**

Cod distribution in the Baltic is affected by environmental conditions, specifically lack of oxygen. This is taken into account in the way the survey results are raised, assuming that no cod occurs in oxygen depleted areas.

### *Comparison with previous assessment and advice*

The current perception of the status of the Eastern Baltic cod stock in terms of development trends is similar to that from the 2008 assessment (SSB has been increasing and F declining over the past 3 years). The estimate of SSB in 2007 has been revised downwards by 11% and the F in 2007 upwards by 3% (see Figure 8.4.2.3). The benchmark workshop in 2009 identified problems with the commercial tuning fleets. In the recent assessment the commercial tuning fleets have been revised and a new standardized Danish trawler tuning fleet is used as the only commercial index.

The basis for the advice is similar to last year, i.e. to apply the EU management plan for the year 2010.

### **Sources of information**

Report of the Baltic Fisheries Assessment Working Group. ICES Headquarters, 22–28 April 2009 (ICES CM 2009/ACOM:07).

Year	ICES Advice	Predicted landings corresp. To advice	Agreed TAC <sup>1</sup>	ICES landings (25–32)	ICES landings (22–32)
1987	Reduce towards $F_{max}$	245		207	236
1988	TAC	150		194	223
1989	TAC	179	220	179	198
1990	TAC	129	210	153	171
1991	TAC	122	171	123	140
1992	Lowest possible level	-	100	55 <sup>2</sup>	73 <sup>2</sup>
1993	No fishing	0	40	45 <sup>2</sup>	66 <sup>2</sup>
1994	TAC	25	60	93 <sup>2</sup>	124 <sup>2</sup>
1995	30% reduction in fishing effort from 1994	-	120	108 <sup>2</sup>	142 <sup>2</sup>
1996	30% reduction in fishing effort from 1994	-	165	122	173
1997	20% reduction in fishing mortality from 1995	130	180	89	132
1998	40% reduction in fishing mortality from 1996	60	140	67	102
1999	Proposed $F_{pa}$ (= 0.6)	88	126	73	115
2000	40% reduction in F from 96–98 level	60	105	89 <sup>2</sup>	128
2001	Fishing mortality of 0.30	39	105	91 <sup>2</sup>	126
2002	No fishing	0	76	68 <sup>2</sup>	92
2003	70% reduction in F	See option table	75	69 <sup>2</sup>	94
2004	90% reduction in F	< 13.0	45.4	68 <sup>2</sup>	*
2005	No fishing	0	42.8	55 <sup>2</sup>	*
2006	Develop Management plan	< 14.9	49.2	66 <sup>2</sup>	*
2007	No fishing	0	44.3	51 <sup>2</sup>	*
2008	No fishing	0	42.3 <sup>3</sup>	42 <sup>2</sup>	*
2009	Limit (total) landings to 48 600 t	≤ 48.6	49.38 <sup>3</sup>		
2010	Follow management plan	56.8			

Weights in '000 t.

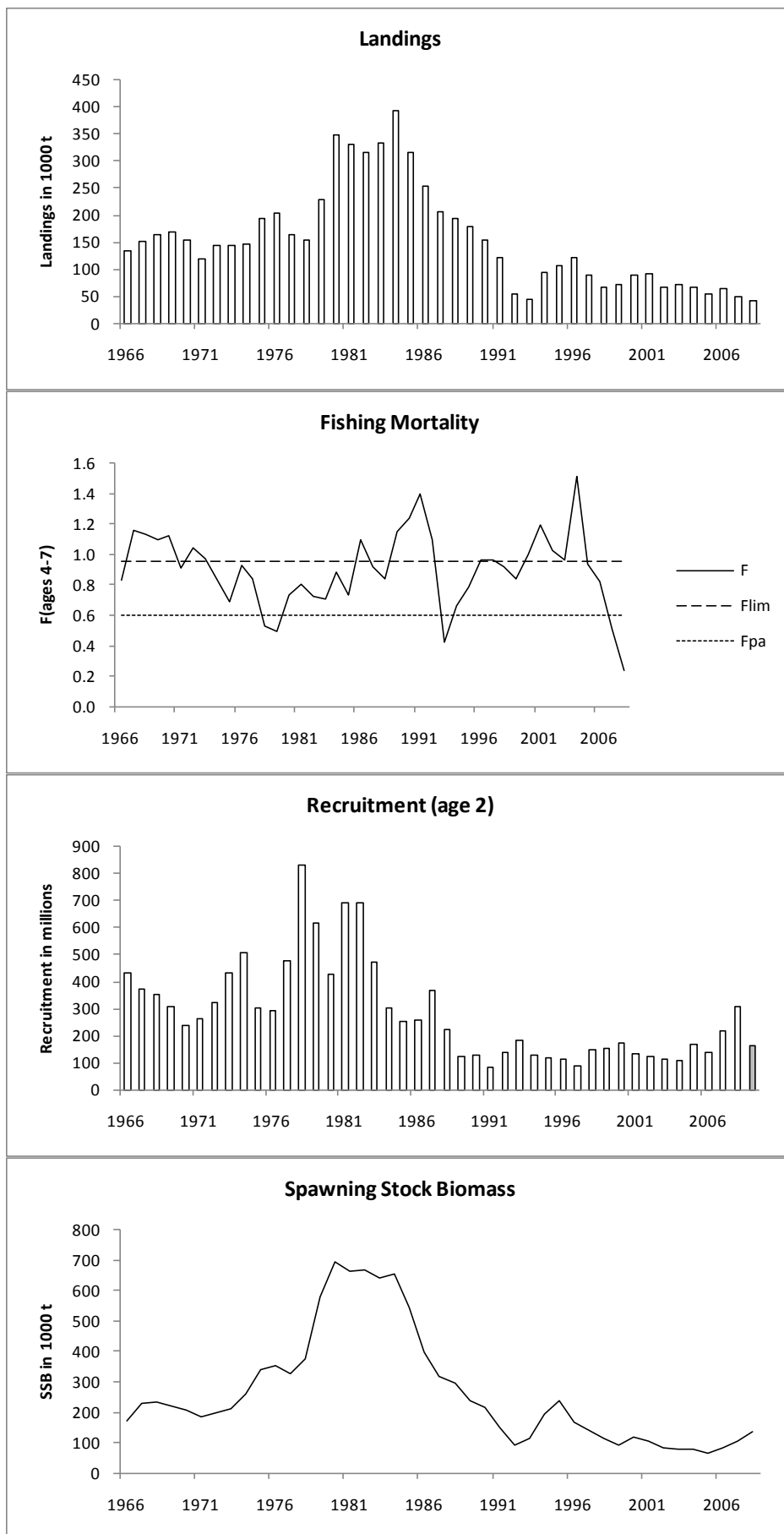
<sup>1</sup> For total Baltic until and including 2003.

<sup>2</sup> The reported landings in 1992–1995 and 2000–2008 are likely to be minimum estimates due to incomplete reporting.

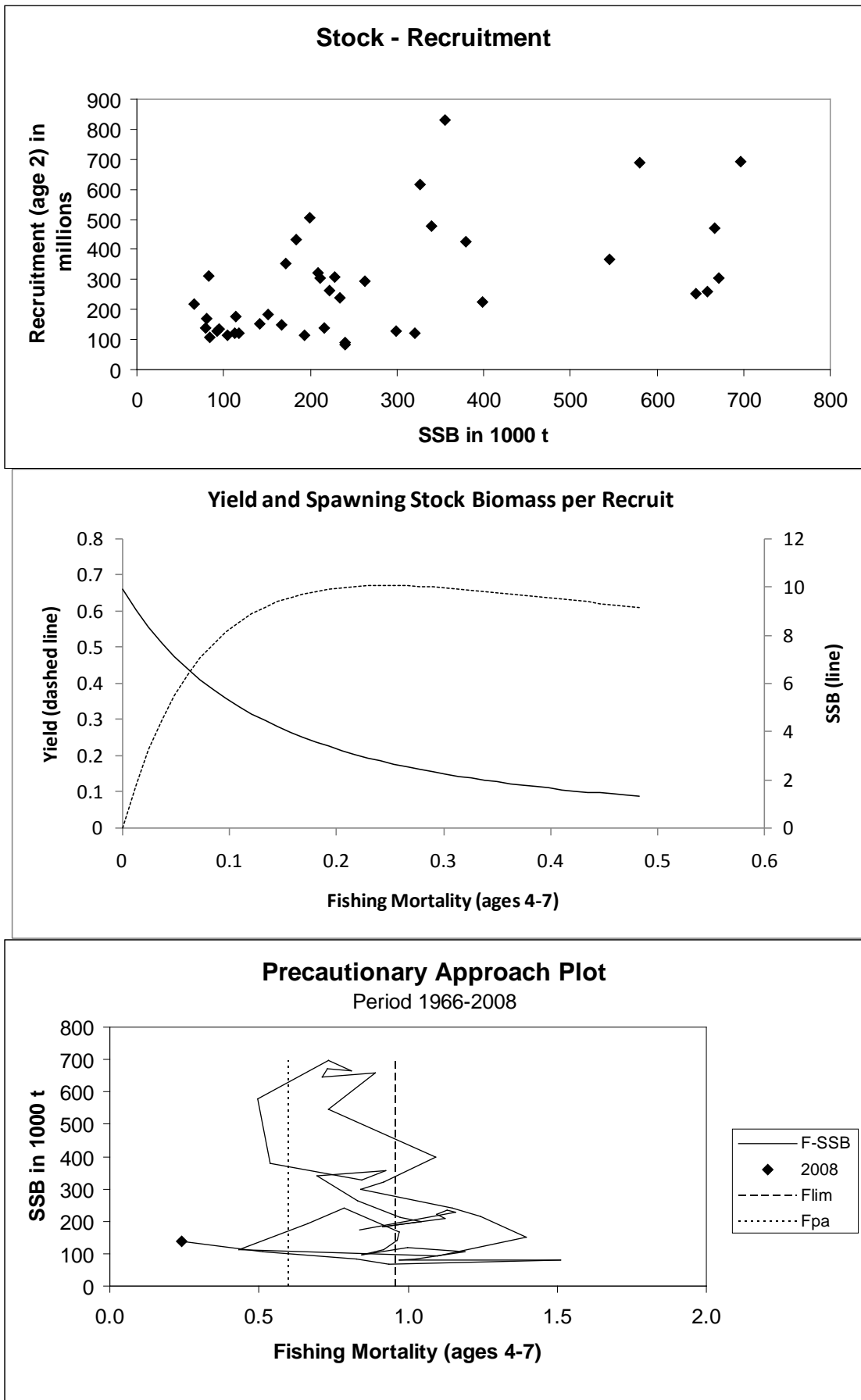
<sup>3</sup> TAC is calculated as EU + Russian autonomous quotas.

\* Separate management for western and eastern Baltic cod since 2004

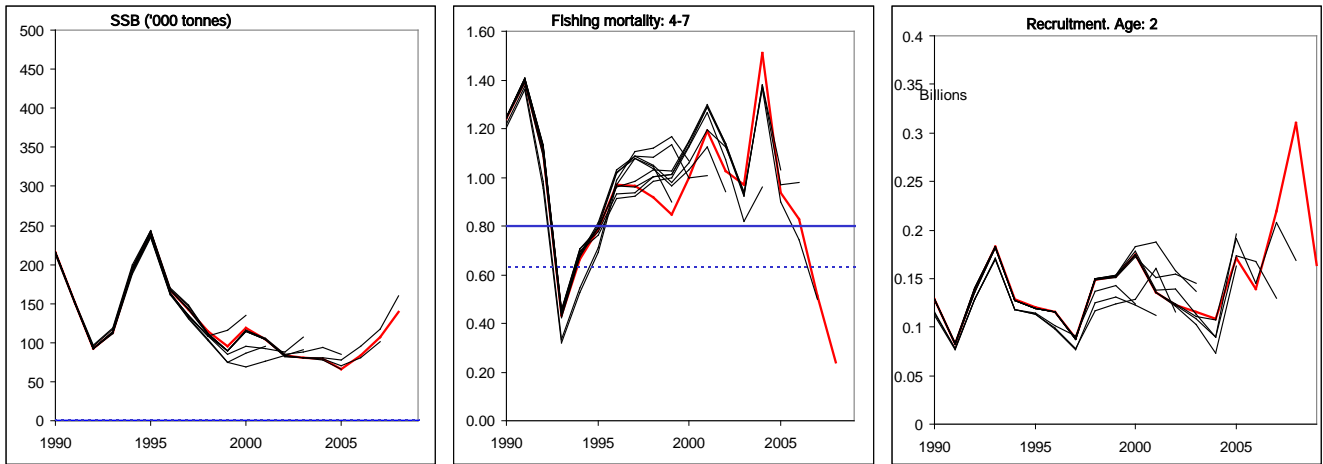
Cod in subdivisions 25–32



**Figure 8.4.2.1** Cod in Subdivisions 25– 32. Landings, fishing mortality, recruitment, and SSB.



**Figure 8.4.2.2** Cod in Subdivisions 25– 32. Stock and recruitment, yield, and SSB per recruit



**Figure 84.23** Cod in Subdivisions 25– 32. Historical performance of the assessments.

**Table 8.4.2.1** Cod in Subdivisions 25–32. Total landings (tonnes) by country.

Year	Denmark	Estonia	Finland	German Dem.Rep. <sup>2</sup>	Germany, Fed. Rep.	Latvia	Lithuania	Poland	Russia	Sweden	USSR	Faroe Islands <sup>4</sup>	Norway	Unallo- cated <sup>3</sup>	Total
1965	15,856		23	975	2,183			41,498		19,523	22,420				102,478
1966	16,570		26	2,196	1,383			56,007		20,415	38,270				134,867
1967	19,924		27	11,020	1,057			56,003		21,367	42,980				152,378
1968	21,516		70	12,118	2,018			63,245		21,895	43,610				164,472
1969	23,459		58	18,460	4,715			60,749		20,888	41,580				169,909
1970	22,307		70	10,103	4,855			68,440		16,467	32,250				154,492
1971	23,116		53	2,970	2,766			54,151		14,251	20,910				118,217
1972	34,072		76	4,055	3,203			57,093		15,194	30,140				143,833
1973	35,455		95	6,034	14,973			49,790		16,734	20,083				143,164
1974	32,028		160	2,517	11,831			48,650		14,498	38,131				147,815
1975	39,043		298	8,700	11,968			69,318		16,033	49,289				194,649
1976	47,412		287	3,970	13,733			70,466		18,388	49,047				203,303
1977	44,400		310	7,519	19,120			47,702		16,061	29,680				164,792
1978	30,266		1,437	2,260	4,270			64,113		14,463	37,200				154,009
1979	34,350		2,938	1,403	9,777			79,754		20,593	75,034	3,850			227,699
1980	49,704		5,962	1,826	11,750			123,486		29,291	124,350	1,250			347,619
1981	68,521		5,681	1,277	7,021			120,901		37,730	87,746	2,765			331,642
1982	71,151		8,126	753	13,800			92,541		38,475	86,906	4,300			316,052
1983	84,406		8,927	1,424	15,894			76,474		46,710	92,248	6,065			332,148
1984	90,089		9,358	1,793	30,483			93,429		59,685	100,761	6,354			391,952
1985	83,527		7,224	1,215	26,275			63,260		49,565	78,127	5,890			315,083
1986	81,521		5,633	181	19,520			43,236		45,723	52,148	4,596			252,558
1987	68,881		3,007	218	14,560			32,667		42,978	39,203	5,567			207,081
1988	60,436		2,904	2	14,078			33,351		48,964	28,137	6,915			194,787
1989	57,240		2,254	3	12,844			36,855		50,740	14,722	4,520			179,178
1990	47,394		1,731		4,691			32,028		50,683	13,461	3,558			153,546
1991	39,792	1,810	1,711		6,564	2,627	1,865	25,748	3,299	36,490		2,611			122,517
1992	18,025	1,368	485		2,793	1,250	1,266	13,314	1,793	13,995		593			54,882
1993	8,000	70	225		1,042	1,333	605	8,909	892	10,099		558	18,978		50,711
1994	9,901	952	594		3,056	2,831	1,887	14,335	1,257	21,264		779	44,000		100,856
1995	16,895	1,049	1,729		5,496	6,638	4,513	25,000	1,612	24,723		777	293	18,993	107,718
1996	17,549	1,338	3,089		7,340	8,709	5,524	34,855	3,306	30,669		706	289	10,815	124,189
1997	9,776	1,414	1,536		5,215	6,187	4,601	31,396	2,803	25,072		600			88,600
1998	7,818	1,188	1,026		1,270	7,765	4,176	25,155	4,599	14,431					67,428
1999	12,170	1,052	1,456		2,215	6,889	4,371	25,920	5,202	13,720					72,995
2000	9,715	604	1,648		1,508	6,196	5,165	21,194	4,231	15,910			23,118		89,289
2001	9,580	765	1,526		2,159	6,252	3,137	21,346	5,032	17,854			23,677		91,328
2002	7,831	37	1,526		1,445	4,796	3,137	15,106	3,793	12,507			17,562		67,740
2003	7,655	591	1,092		1,354	3,493	2,767	15,374	3,707	11,297			22,147		69,476
2004	7,394	1,192	859		2,659	4,835	2,041	14,582	3,410	12,043			19,563		68,578
2005	7,270	833	278		2,339	3,513	2,988	11,669	3,411	7,740			14,991		55,032
2006	9,766	616	427		2,025	3,980	3,200	14,290	3,719	9,672			17,836		65,532
2007	7,280	877	615		1,529	3,996	2,486	8,599	3,383	9,660			12,418		50,843
2008 <sup>1</sup>	7,374	841	670		2,341	3,990	2,835	8,721	3,888	8,901			2,673		42,235

<sup>1</sup>Provisional data. <sup>2</sup>Includes landings from Oct.-Dec. 1990 of Fed.Rep.Germany.

<sup>3</sup>Working group estimates. No information available for years prior to 1993.

<sup>4</sup>For 1997 landings not officially reported, estimated by the WG.

Table 8.4.2.2

Cod in Subdivisions 25–32.

	RECRUITS Age 2	TOTALBIO	TOTSPBIO	LANDINGS	DISCARDS	FBAR 4- 7
1966	430264	355416	172018	134867	8735	0.837
1967	370921	436280	228679	152378	11733	1.1587
1968	354062	422232	233958	164472	9700	1.1303
1969	306727	395953	222659	169909	10654	1.0962
1970	240010	351666	208842	154492	7625	1.1241
1971	264787	314516	184181	118217	5426	0.9133
1972	322278	350280	198995	143833	8490	1.0434
1973	432140	394362	211991	143164	7491	0.9732
1974	506893	500395	262952	147815	7933	0.8311
1975	303683	575916	339545	194649	9576	0.6955
1976	293397	535740	355564	203303	4341	0.9261
1977	479002	533503	326914	164792	2978	0.844
1978	829398	712485	379201	154009	9875	0.5358
1979	615355	983040	579671	227699	14576	0.4952
1980	425886	1026484	696743	347619	8544	0.7342
1981	689813	984216	666132	330742	6185	0.8091
1982	693590	1057369	670941	316052	11548	0.7301
1983	472374	1003058	645258	332148	10998	0.7124
1984	302921	920299	657667	391952	8521	0.8896
1985	253078	737752	544911	315083	8199	0.7334
1986	260215	547641	399372	252558	3848	1.0936
1987	368093	492369	320471	207081	9340	0.9196
1988	224305	462425	299277	194787	7253	0.84
1989	122510	352922	240279	179178	3462	1.1477
1990	128345	271637	216041	153546	4187	1.243
1991	82896	193245	151619	122517	2741	1.3951
1992	137793	133755	93014	54882	1904	1.099
1993	182824	173187	113338	45188	1558	0.4311
1994	128602	268025	193254	93380	1956	0.6635
1995	120037	314770	239910	107712	1872	0.7849
1996	115560	227798	166984	121877	1443	0.9693
1997	88718	202087	141682	88600	3462	0.9633
1998	149134	180714	114015	67429	2299	0.9185
1999	152132	185031	94987	72989	1838	0.8456
2000	175073	216904	118098	89168	6019	0.9978
2001	135495	171539	104696	91325	2891	1.1908
2002	122694	141787	84254	67740	1462	1.0259
2003	115559	136229	80201	71386	2024	0.9692
2004	108663	131689	79419	67768	1201	1.5123
2005	171243	123031	66265	55254	1670	0.937
2006	139491	157454	83292	65532	4644	0.8282
2007	219317	179789	106429	50843	4146	0.5143
2008	310174	241638	139321	42235	3762	0.2415
2009	164121					
Arith.Mean	287104	420852	265885	155120	5770	0.901
Units	(Thousands)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	

**Annex: Baltic cod multiannual plan**

*EU Council regulation 1098/2007*

Procedure for setting the TACs for Eastern Baltic cod:

Art. 4-6

1. The Council shall adopt the TAC that, according to a scientific evaluation carried out by the Scientific, Technical and Economic Committee for Fisheries (STECF), is the higher of:
  - (a) the TAC that would result in a 10% reduction in the fishing mortality rate in its year of application compared to the fishing mortality rate estimated for the preceding year;
  - (b) the TAC that would result in the level of fishing mortality rate of 0.3 on ages 4 to 7 years.
2. Where the application of paragraph 1 would result in a TAC that exceeds the TAC for the preceding year by more than 15%, the Council shall adopt a TAC which is 15% greater than the TAC of that year.
3. Where the application of paragraph 1 would result in a TAC that is more than 15% below the TAC of the preceding year, the Council shall adopt a TAC which is 15% less than the TAC of that year.
4. Paragraph 3 shall not apply where a scientific evaluation carried out by the STECF shows that the fishing mortality rate in the year of application of the TAC will exceed a value of 0.6 per year for the ages 4 to 7 years.