# ECOREGION Celtic Sea and West of Scotland
# STOCK Cod in Division VIa (West of Scotland)

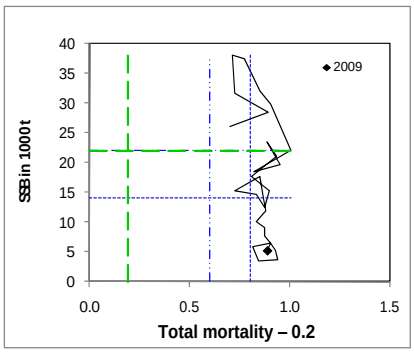
**Advice Summary for 2011**

| Management Objective (s) | Catches in 2011 |
|---|---|
| Transition to an **MSY approach** with caution at low stock size | Zero catch |
| Cautiously avoid impaired recruitment (**Precautionary Approach**) | Zero catch |
| Cautiously avoid impaired recruitment and achieve other objective(s) of a **management plan** (e.g., catch stability) | n/a |

Current landings (i.e. TAC), effort, and spatial management of fisheries catching cod in Division VIa are not controlling mortality levels. Catch (landings + discards) is seven times the reported landings in 2009.

**Stock status**

| **Fishing mortality** | 2007 | 2008 | 2009 |
|---|---|---|---|
| $F_{MSY}$ | unknown | unknown | unknown |
| $F_{PA}/F_{lim}$ | unknown | unknown | unknown |
| | | | |
| **Spawning Stock Biomass** (SSB) | 2008 | 2009 | 2010 |
| **MSY** $B_{trigger}$ | below | below | below |
| $B_{PA}/B_{lim}$ | below | below | below |



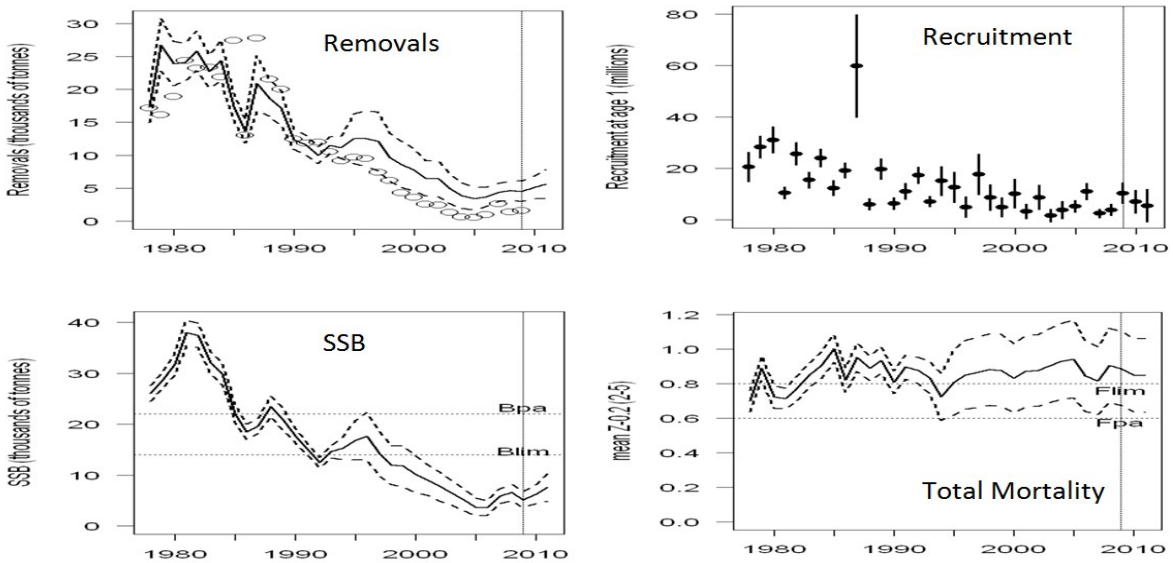




**Figure 5.4.21.1** Cod in Division VIa (West of Scotland). Summary of stock assessment (weights in '000 tonnes). Removals: open circles = observed catches, lines = estimated removals. Estimates are plotted with approximate point-wise 95% confidence bounds. The vertical line in each plot delineates the last year of the historical assessment (2009); estimates to the right of these lines are forecasts.

Total mortality is high, but cannot be accurately partitioned into fishing mortality and natural mortality. The spawning-stock biomass has increased from an all time low in 2006, but remains well below $B_{lim}$. Recruitment has been estimated to be low over the last decade. The 2005 and 2008 year classes are estimated to be the largest since 1997 and comparable with the long term geometric mean.

**Management plans**

Following the cod long term management plan (EC 1342/2008) the stock is considered data poor. Article 9(a) implies a TAC and associated effort reduction of 25%. This translates to a TAC of less than 180 t. ICES considers that article 10(2) may also apply.

**Biology**

Cod are known to be a hyperaggregrating species so at low abundance it is still possible to find areas of high cod density. This can lead to high catches in localised areas and low levels of fishing effort causing high mortality on the stock is possible. Occasional large catches cause greater uncertainty in survey abundance indices. Relatively stable aggregations on timescales of several weeks are consistent with management by temporary spatial closures.

**Environmental influence on the stock**

Grey seal abundance has increased from 32 to 40 thousand west of Scotland over the recent decades. Seals are known to feed on cod, amongst other species, and the mortality of cod due to seal predation is likely to have increased in recent years. The contribution of seal predation to total cod mortality is likely to be significant. This may impair the ability of the cod stock to recover. A negative impact on recruitment with rising sea temperature has been shown for cod in the warmer waters of this species' range, including cod west of Scotland.

**The fisheries**

100 mm + Otter trawl gear vessels targeting finfish (TR1) take roughly 80% of cod catch and the 70–99 mm *Nephrops* fleet (TR2) take 15–20% of the catch. A significant proportion of the landings come from vessels using TR1gear fishing west of the line defined in the cod long-term management plan.

| | |
|---|---|
| **Catch by fleet** | Total catch (2009) 1600 t where 14% reported landings , 86% discards |

**Effects of the fisheries on the ecosystem**

Cod is taken in mixed demersal fisheries and there are no impacts specific to the catching of cod.

**Quality considerations**

Quantities of landings and discards are not included in the model (only weights at age information) because of concerns over unreliability in the historical commercial data. Mortality estimates arising from this assessment - based on survey data - are poorly estimated. Because of uncertainties in the level and trend of natural mortality it is not possible to predict landings estimates from the forecast, only removals associated with both fishing and unaccounted natural mortality.

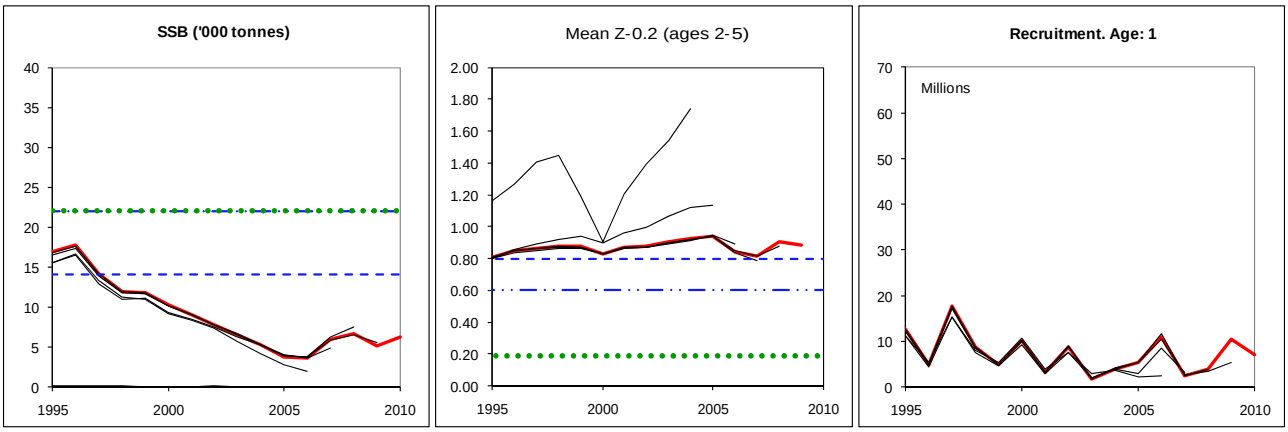



**Figure 5.4.21.2** Cod in Division VIa (West of Scotland). Historical assessment results (final year recruitment estimates included).

**Scientific basis**

| | |
|---|---|
| **Assessment type** | Analytical age based assessment (TSA) |
| **Input data** | 1 survey index (ScoGFS-1Q) |
| **Discards and bycatch** | Included in the assessment 1978–1994, excluded from 1995 onward |
| **Indicators** | none |
| **Other information** | Landings and discard data are excluded from 1995 onward, a benchmark for this stock is proposed for the end of 2011 |
| **Working group report** | WGCSE |

## ECOREGION Celtic Sea and West of Scotland
## STOCK Cod in Division VIa (West of Scotland)

**Reference points**

| | *Type* | *Value* | *Technical basis* |
|---|---|---|---|
| MSY Approach | MSY $B_{trigger}$ | 22 000 t | $B_{pa}$ |
| | $F_{MSY}$ | 0.19 | Provisional proxy by analogy with North Sea cod Fmax. Fishing mortalities in the range 0.17–0.33 are consistent with Fmsy |
| Precautionary Approach | $B_{lim}$ | 14 000 t | $B_{lim} = B_{loss}$, the lowest observed spawning stock estimated in previous assessments. |
| | $B_{pa}$ | 22 000 t | Considered to be the minimum SSB required to ensure a high probability of maintaining SSB above $B_{lim}$, taking into account the uncertainty of assessments. This also corresponds with the lowest range of SSB during the earlier, more productive historical period. |
| | $F_{lim}$ | 0.8 | Fishing mortalities above this have historically led to stock decline. |
| | $F_{pa}$ | 0.6 | This F is considered to have a high probability of avoiding $F_{lim}$. |

*(unchanged since: 2010)*

**Outlook for 2011**

No short term forecast is provided because recent mortality values are highly uncertain due to unaccounted mortality.

***MSY approach***

Estimates of $F_{MSY}$ for this stock are uncertain due to the absence of fisheries data in the assessment since 1994. However, the estimates are consistent with the proposed Fmsy for the neighbouring North Sea cod stock. There is no estimate for current fishing mortality for this stock. However, it is likely that current F is above $F_{MSY}$. SSB has declined to a very low level. Therefore, catches (mainly discards) of cod should be reduced to the lowest possible level.

***PA Considerations***

Given the low SSB and low recruitments in recent years, it is not possible to identify any non-zero catch which would be compatible with the precautionary approach. No targeted fishing should take place on cod in Division VIa. Bycatches including discards of cod in all fisheries in Division VIa should be reduced to the lowest possible level.

The 2008 year class is estimated to be more abundant, and consequently additional measures (such as real time closures) to protect it are essential to ensure that it contributes to the rebuilding of the stock. It will be necessary to reduce all sources of fishing mortality on cod to as close to zero as possible if the stock is to recover above $B_{pa}$ as quickly as possible

***Management plan***

The stock is considered data poor. Following the cod long term management plan (EC 1342/2008) article 9(a) implies a TAC and associated effort reduction of 25%. This translates to a TAC of less than 180 t. ICES considers that article 10(2) may also apply. Because it is not possible at present to assess unaccounted mortality accurately, ICES cannot yet evaluate if the management plan is in accordance with the precautionary approach.

**Additional considerations**

*Management considerations*

The stock is suffering impaired recruitment. SSB is very low. It is necessary to reduce all sources of fishing mortality to recover the stock above Bpa as quickly as possible. Management measures taken thus far have not recovered the stock.

The previous cod recovery plan did not apply west of a line known as the west of Scotland management line. The cod long term management plan (EC Reg. No. 1342/2008) includes a west of Scotland management line that follows the 200 m depth contour. Fleets fishing at depths less than 200 m (i.e. within the cod recovery zone) are subject to the effort restrictions of the management plan and new gear technical measures specified in EC Reg. No. 53/2010. Vessels fishing to the west of the management line are still subject to effort restrictions but may apply for additional effort up to the

point where fleet aggregated effort equals that from the previous year (if fleet effort allowances were cut). Some landings from this stock are taken west of the line defined in EC 1342/2008. Some vessels using > 100 mm otter trawl (TR1) gear have larger cod landings from west of the line than from within the cod recovery zone.

Grey seal abundance has increased from 32 to 40 thousand west of Scotland over the recent decades (Thomas and Harwood, 2008). Seals are known to feed on cod, amongst other species, and the mortality of cod due to seal predation is likely to have increased in recent years. The contribution of seal predation to total cod mortality is likely to be significant (Pope and Holmes, 2008). This may impair the ability of the cod stock to recover.

*Management plan evaluations*

In 2009 the EU adopted a long-term plan for cod stocks and the fisheries exploiting those stocks (Council Regulation (EC) 1342/2008, see Annex 5.4.21). This regulation has the objective of ensuring the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a target fishing mortality of 0.4 on specified age groups.

In 2009 ICES evaluated this revised long-term plan for cod (Council Regulation (EC) 1342/2008) in relation to the precautionary approach. This evaluation concluded that under the assumption TAC and effort constraints would lead to rapid declines in fishing mortality the stock would recover by 2015. Given the recent changes in discarding in response to a moderate year class and the difficulty in partitioning the total mortality into that attributable to landings, discards, other causes due to fishing and natural mortality in excess of the assumed 0.2 ICES could not conclude the plan was precautionary.

ICES has previously commented on the appropriateness of F= 0.4 as a target in this stock. Based on the yield-per-recruit analysis, which estimates $F_{max}$=0.22 and the positive relationship of SSB and recruitment, the long term target fishing mortality of 0.4 is not expected to achieve the management objective of maximum sustainable yield.

*Regulations and their effects*

The fishery is managed by a combination of TAC, area closures, technical measures, and effort restrictions. Current landings (i.e. TAC) effort and spatial management of fisheries catching cod in Division VIa are not controlling mortality levels. Catch (landings + discards) is seven times the reported landings.

Area closures

- Clyde Sea area closure – STECF (2007) noted that the Clyde closure includes the main spawning area of a reproductively isolated aggregation of cod and concluded that the closure is likely to have a positive effect in reducing targeting of high densities of mature cod.
- Windsock closed area – STECF (2007) concluded that the extent of the Windsock closure is unlikely to be large enough to greatly reduce fishing mortality on cod, and its boundaries should be reconsidered. However, its removal would not help improve cod recovery.

Mesh sizes and catch composition rules

- Catch composition rules related to days-at-sea allowances (Reg. (EC) 850/1998 Annex I and Reg. (EC) 2056/2001) – These rules legislate for landings compositions but do not restrict discards.
- Under the West Coast Emergency measures for 2009 (and rolled forward into 2010) there were new gear technical measures specified in EC Reg. No. 43/2009 introduced to improve selectivity. These involved larger meshes in the fleet targeting demersal fish (120mm) and a larger meshed square meshed panel in the *Nephrops* fleet (120mm). The regulation also includes new catch composition rules.
- It is too early to evaluate the impact of these new regulations.

Effort limitations

- Between 2002 and 2008 STECF (2009) reported that the fishing effort (in kWdays) of trawlers using >100 mm mesh declined by 56%. These vessels primarily targeted round fish including cod. Over the same period effort for trawlers using 70–99 mm mesh remained relatively stable. These vessels primarily target *Nephrops*.
- Further effort reductions have been implemented since February 2010 under Annex IIa of Reg. (EC) 43/2009. This includes a 25% reduction in effort for all trawl fleets relative to a recent average effort. 'Buy back' of this effort reduction is possible after adoption of cod avoidance measures or proof of operating west of the cod management line.

Supply chain traceability

U.K. “Buyers and Sellers” regulation and Irish “Sales Note” regulation – Unreported landings are expected to have reduced under these regulations. Observer data, however, show an increase in discards starting in 2006. The amount of discards relative to landings has increased and the age pattern of discarding has changed. Currently discards of fish aged 3 and above are being recorded.

Cod avoidance measures

In 2008, Scotland introduced a voluntary programme known as “Conservation Credits”, which involved real-time closures (RTCs) combined with gear requirements. This was designed to reduce mortality and discarding of cod. The scheme was incentivised by rewarding participating skippers with additional days at sea. The real-time closures system discouraged vessels from operating in areas of high cod abundance. In 2009, the annual target for the number of closures was increased substantially (to 150 for all areas subject to the cod management plan) and made mandatory, with up to 12 being implemented at any one time. The scheme has continued in 2010. Closures are determined by landings per unit effort, based on fine scale VMS data and daily logbook records and also by onboard inspections. The scheme also includes voluntary avoidance areas known as ‘amber zones’, although in 2009 few vessels took up this option. The use of more species selective gears trialled by the Marine Laboratory in Aberdeen forms a further series of options within the scheme. Preliminary results so far suggest that cod discard rate in the North Sea fell in 2009 and that catches of cod were more in line with those forecast. In Division VIa, however, early indications are that the scheme has not been so effective so far with discard rates remaining high.

*Changes in fishing technology and fishing patterns*

The implementation of the cod long term plan effort controls (Annex IIa of Reg. (EC) 43/2009) and other technical measures including gear restriction in VIa (Annex III of Reg. (EC) 43/2009) was expected to lead to large changes in fishing patterns in 2009. Analysis is not yet available to evaluate this.

*Uncertainties in assessment and forecast*

Survey information shows that the total removal of cod in Division VIa may have been underestimated in the past decade relative to earlier periods. In an attempt to remove bias in the assessment a catch-at-age model was used that ignored landings and discard numbers from 1995 onwards, relying on survey data for this later period. It is, however, considered that mortality estimates arising from this assessment heavily or wholly based on survey data are poorly estimated. In contrast, historical trends in spawning biomass and recruitment appear to be robust measures of stock dynamics, see Figure 5.4.21.3.

Because of uncertainties in the level and trend of natural mortality it is not possible to predict landings estimates from a forecast, only removals associated with both fishing and unaccounted natural mortality.

*Comparison with previous assessment and advice*

The basis for the assessment is the same as last year. The advice is the same as last year but extended by MSY considerations.

**Sources**

ICES. 2010. Report of the Working Group on Celtic Seas Ecosystems, 12–20 May 2010, Copenhagen, Denmark ICES CM 2010/ACOM:12.

Pope, J. G., and Holmes, S. J. 2008. Length-based Approaches compared to Age-based Approaches to Determining the Significance of Grey Seal Feeding on Cod in ICES Division VIa. ICES CM 2008/F:08.

STECF. 2007. Evaluation of closed area schemes (SGMOS-07-03).

Thomas, L. and J. Harwood. 2006. Estimating the size of the UK grey seal population between 1984 and 2005, and related research. SCOS Briefing Paper 08/2.

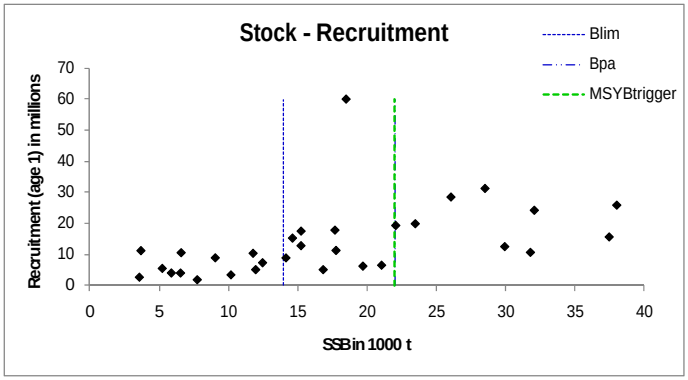



**Figure 5.4.21.3** Cod in Division VIa. Stock and recruitment relationship.

**Table 5.4.21.1** Cod in Division VIa (West of Scotland). ICES advice, management and landings.

| Year | ICES advice Single stock exploitation boundaries since 2004 | Predicted catch corresp. to advice | Agreed TAC[1] | Agreed TAC[2] | Official landings | ICES Landings |
|---|---|---|---|---|---|---|
| 1987 | Reduce F towards $F_{max}$ | 18.0 | 22.0 | | 19.2 | 19.0 |
| 1988 | No increase in F; TAC | 16.0 | 18.4 | | 19.2 | 20.4 |
| 1989 | 80% of F(87); TAC | 16.0 | 18.4 | | 15.4 | 17.2 |
| 1990 | 80% of F(88); TAC | 15.0 | 16.0 | | 11.8 | 12.2 |
| 1991 | 70% of effort (89) | - | 16.0 | | 10.6 | 10.9[3] |
| 1992 | 70% of effort (89) | - | 13.5 | | 9.0 | 9.7[4] |
| 1993 | 70% of effort (89) | - | 14.0 | | 10.5 | 11.8[4] |
| 1994 | 30% reduction in effort | - | 13.0 | | 9.1 | 10.8[4] |
| 1995 | Significant reduction in effort | - | 13.0 | | 9.7 | 9.6[4] |
| 1996 | Significant reduction in effort | - | 13.0 | | 9.6 | 9.4 |
| 1997 | Significant reduction in effort | - | 14.0 | | 7.0 | 7.0 |
| 1998 | 20% reduction in F | 9.5[6] | 11.0 | | 5.7 | 5.7 |
| 1999 | F reduced to below $F_{pa}$ | <9.7[6] | 11.8 | | 4.3 | 4.2 |
| 2000 | Recovery plan, 60% reduction in F | <4.2 | 7.48 | | 2.8[5] | 3.0 |
| 2001 | Lowest possible F, recovery plan | - | 3.7 | | 2.4 | 2.3 |
| 2002 | Recovery plan or lowest possible F | - | 4.6 | | 2.2 | 2.2 |
| 2003 | Closure | - | 1.81 | | 1.3 | 1.2 |
| 2004 | Zero catch [7] | 0 | 0.85 | | 0.6 | 0.5 |
| 2005 | Zero catch [7] | 0 | 0.72 | | 0.4 | 0.5 |
| 2006 | Zero catch [7] | 0 | 0.613 | | 0.5 | 0.5 |
| 2007 | Zero catch [7] | 0 | 0.49 | | 0.5 | 0.5 |
| 2008 | Zero catch [7] | 0 | 0.402 | | 0.4 | 0.5 |
| 2009 | Zero catch [7] | 0 | 0.302 | 0.240 | 0.2 | 0.2 |
| 2010 | Zero catch [7] | 0 | | 0.240 | | |
| 2011 | Zero catch [7] | 0 | | | | |

Weights in '000 t.
[1] TAC is for the whole of Subdivision $Vb_1$ and Subareas VI, XII, and XIV.
[2] TAC is for Subdivision $Vb_1$ and Division VIa.
[3] Not including misreporting.
[4] Including ICES estimates of misreporting.
[5] Incomplete data.
[6] For Division VIa only.
[7] Single-stock boundaries and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

**Table 5.4.21.2** Cod in Division VIa. Official landings (tonnes).

| Country | Belgium | Denmark | Faroe Islands | France | Germany | Ireland | Netherlands | Norway | Spain | UK (E., W., N.I.) | UK (Scotland) | UK | Total landings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | 48 | - | - | 7411 | 66 | 2564 | - | 204 | 28 | 260 | 8032 | | 18613 |
| 1986 | 88 | - | - | 5096 | 53 | 1704 | - | 174 | - | 160 | 4251 | | 11526 |
| 1987 | 33 | 4 | - | 5044 | 12 | 2442 | - | 77 | - | 444 | 11143 | | 19199 |
| 1988 | 44 | 1 | 11 | 7669 | 25 | 2551 | - | 186 | - | 230 | 8465 | | 19182 |
| 1989 | 28 | 3 | 26 | 3640 | 281 | 1642 | - | 207 | 85 | 278 | 9236 | | 15426 |
| 1990 | - | 2 | - | 2220 | 586 | 1200 | - | 150 | - | 230 | 7389 | | 11777 |
| 1991 | 6 | 2 | - | 2503 | 60 | 761 | - | 40 | - | 511 | 6751 | | 10634 |
| 1992 | - | 3 | - | 1957 | 5 | 761 | - | 171 | - | 577 | 5543 | | 9017 |
| 1993 | 22 | 2 | - | 3047 | 94 | 645 | - | 72 | - | 524 | 6069 | | 10475 |
| 1994 | 1 | + | - | 2488 | 100 | 825 | - | 51 | - | 419 | 5247 | | 9131 |
| 1995 | 2 | 4 | - | 2533 | 18 | 1054 | - | 61 | 16 | 450 | 5522 | | 9660 |
| 1996 | + | 2 | - | 2253 | 63 | 1286 | - | 137 | + | 457 | 5382 | | 9580 |
| 1997 | 11 | - | - | 956 | 5 | 708 | 2 | 36 | 6 | 779 | 4489 | | 6992 |
| 1998 | 1 | - | - | 714 | 6 | 478 | 1 | 36 | 42 | 474 | 3919 | | 5671 |
| 1999 | + | + | - | 842 | 8 | 223 | - | 79 | 45 | 381 | 2711 | | 4289 |
| 2000 | + | - | - | 236 | 6 | 357 | - | 114 | 14 | 280 | 2057 | | 2767 |
| 2001 | 2 | - | - | 391 | 4 | 319 | - | 40 | 3 | 138 | 1544 | | 2439 |
| 2002 | + | - | - | 208 | + | 210 | - | 88 | 11 | 195 | 1519 | | 2231 |
| 2003 | | | | 172 | + | 120 | - | 45 | 3 | 79 | 879 | | 1298 |
| 2004 | | | 2 | 91 | | 34 | | 10 | | 46 | 413 | | 596 |
| 2005 | | | 0 | 107 | | 28 | | 17 | | 25 | 243 | | 420 |
| 2006 | | | 1 | 101 | 2 | 18 | | 30 | | | | 332 | 484 |
| 2007 | | | 12 | 92 | 2 | 70 | | 30 | | 21 | 260 | | 487 |
| 2008 | | | 1 | 82 | 1 | 58 | | 65 | | 6 | 232 | | 445 |
| 2009* | | | | | 0 | 24 | 0 | 18 | | | | 120 | 162 |

* Preliminary

**Table 5.4.21.3** Cod in Division VIa (West of Scotland). Summary of stock assessment (weights in tonnes). Total removals (TSA) are the estimated total removals in excess of removals due to the assumed natural mortality rate. Mean Z-0.2 are the estimated mortality corresponding to total removals.

| Year | Recruitment Age 1 thousands | SSB | Total removals (TSA) | Landings used by ICES WG | Discards used by ICES WG | Mean Z-0.2 Ages 2-5 |
|---|---|---|---|---|---|---|
| 1978 | 20567 | 26047 | 17315 | 13521 | 3678 | 0.698 |
| 1979 | 28327 | 28504 | 26745 | 16087 | 54 | 0.889 |
| 1980 | 31096 | 31778 | 23914 | 17879 | 996 | 0.723 |
| 1981 | 10503 | 38006 | 24121 | 23866 | 520 | 0.713 |
| 1982 | 25712 | 37459 | 25864 | 21510 | 1652 | 0.773 |
| 1983 | 15478 | 32060 | 22735 | 21305 | 2026 | 0.851 |
| 1984 | 24055 | 29925 | 24371 | 21271 | 635 | 0.905 |
| 1985 | 12357 | 22067 | 17371 | 18608 | 8812 | 1.003 |
| 1986 | 19169 | 18484 | 13654 | 11820 | 1201 | 0.820 |
| 1987 | 59887 | 19695 | 20910 | 18975 | 8767 | 0.952 |
| 1988 | 6056 | 23473 | 18654 | 20413 | 1217 | 0.888 |
| 1989 | 19725 | 21041 | 17148 | 17171 | 2833 | 0.934 |
| 1990 | 6357 | 17755 | 12349 | 12176 | 326 | 0.807 |
| 1991 | 11119 | 15235 | 11621 | 10926 | 917 | 0.896 |
| 1992 | 17343 | 12457 | 9990 | 9086 | 2897 | 0.875 |
| 1993 | 7160 | 14615 | 11517 | 10315 | 192 | 0.834 |
| 1994 | 15100 | 15232 | 11175 | 8929 | 186 | 0.724 |
| 1995 | 12650 | 16831 | 12508 | 9438 | 257 | 0.807 |
| 1996 | 4934 | 17680 | 12555 | 9425 | 87 | 0.850 |
| 1997 | 17671 | 14148 | 12111 | 7033 | 354 | 0.866 |
| 1998 | 8717 | 11960 | 9641 | 5714 | 423 | 0.880 |
| 1999 | 4932 | 11773 | 8604 | 4201 | 98 | 0.876 |
| 2000 | 10206 | 10177 | 7763 | 2977 | 607 | 0.830 |
| 2001 | 3249 | 9046 | 6469 | 2347 | 224 | 0.871 |
| 2002 | 8748 | 7745 | 6406 | 2242 | 169 | 0.876 |
| 2003 | 1675 | 6538 | 4888 | 1241 | 49 | 0.903 |
| 2004 | 3852 | 5223 | 3861 | 540 | 75 | 0.927 |
| 2005 | 5332 | 3682 | 3394 | 479 | 57 | 0.942 |
| 2006 | 11053 | 3573 | 3631 | 463 | 478 | 0.844 |
| 2007 | 2488 | 5879 | 4341 | 525 | 2104 | 0.816 |
| 2008 | 3860 | 6585 | 4626 | 451 | 909 | 0.905 |
| 2009 | 10390 | 5166 | 4505 | 222 | 1401 | 0.887* |
| 2010 | 7062 | 6227 | | | | |
| Average | 13540 | 16547 | 12961 | 10036 | 1381 | 0.855 |

(*) recent mortality values are poorly estimated due to unaccounted mortality.

## 5.4.21 Annex

The European Commission has adopted a Council Regulation ((EC) No. 1342/2008) which establishes measures for the recovery and long term management of cod stocks. The stated objective of the plan is to ensure the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a fishing mortality of 0.4. Articles 7 – 9, describing aspects of the plan relevant for west of Scotland cod, are reproduced below:

*Article 7*

**Procedure for setting TACs for cod stocks in the Kattegat the west of Scotland and the Irish Sea**

*1. Each year, the Council shall decide on the TAC for the following year for each of the cod stocks in the Kattegat, the west of Scotland and the Irish Sea. The TAC shall be calculated by deducting the following quantities from the total removals of cod that are forecast by STECF as corresponding to the fishing mortality rates referred to in paragraphs 2 and 3: (a) a quantity of fish equivalent to the expected discards of cod from the stock concerned; (b) as appropriate a quantity corresponding to other sources of cod mortality caused by fishing to be fixed on the basis of a proposal from the Commission.*

*2. The TAC shall, based on the advice of STECF, satisfy all of the following conditions: (a) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be below the minimum spawning biomass level established in Article 6, the fishing mortality rate shall be reduced by 25 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year; (b) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be below the precautionary spawning biomass level set out in Article 6 and above or equal to the minimum spawning biomass level established in Article 6, the fishing mortality rate shall be reduced by 15 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year; and (c) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be above or equal to the precautionary spawning biomass level set out in Article 6, the fishing mortality rate shall be reduced by 10 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year.*

*If the application of paragraph 2(b) and (c) would, based on the advice of STECF, result in a fishing mortality rate lower than the fishing mortality rate specified in Article 5(2), the Council shall set the TAC at a level resulting in a fishing mortality rate as specified in that Article.*

*4. When giving its advice in accordance with paragraphs 2 and 3, STECF shall assume that in the year prior to the year of application of the TAC the stock is fished with an adjustment in fishing mortality equal to the reduction in maximum allowable fishing effort that applies in that year.*

*5. Notwithstanding paragraph 2(a), (b) and (c) and paragraph 3, the Council shall not set the TAC at a level that is more than 20 % below or above the TAC established in the previous year.*

*Article 9*

**Procedure for setting TACs in poor data conditions**

*Where, due to lack of sufficiently accurate and representative information, STECF is not able to give advice allowing the Council to set the TACs in accordance with Articles 7 or 8, the Council shall decide as follows: (a) where STECF advises that the catches of cod should be reduced to the lowest possible level, the TACs shall be set according to a 25 % reduction compared to the TAC in the previous year; (b) in all other cases the TACs shall be set according to a 15 % reduction compared to the TAC in the previous year, unless STECF advises that this is not appropriate.*

*Article 10*

**Adaptation of measures**

*1. When the target fishing mortality rate in Article 5(2) has been reached or in the event that STECF advises that this target, or the minimum and precautionary spawning biomass levels in Article 6 or the levels of fishing mortality rates given in Article 7(2) are no longer appropriate in order to maintain a low risk of stock depletion and a maximum sustainable yield, the Council shall decide on new values for these levels.*
*2. In the event that STECF advises that any of the cod stocks is failing to recover properly, the Council shall take a decision which: (a) sets the TAC for the relevant stock at a level lower than that provided for in Articles 7, 8 and 9; (b) sets the maximum allowable fishing effort at a level lower than that provided for in Article 12; (c) establishes associated conditions as appropriate.*