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PART TWO

3.7 Stocks in Sub-area VI

3.7.1 Overview

Fisheries

The whitefish fisheries in Division VIa are predominantly conducted by otter-trawlers fishing for cod, haddock and whiting, with by-catches of saithe, anglerfish, megrim and lemon sole. These trawlers use mesh sizes of 80-100 mm depending on area and may at times discard considerable amounts of young haddock and whiting. The majority of these vessels are locally-based Scottish trawlers using 'light-trawls', but trawlers from Northern Ireland, England, France and Germany also participate in this fishery. The importance of Scottish seiners essentially targeted at haddock has been declining in recent years as many of these vessels have been converted to trawlers. The larger Scottish trawlers opportunistically operate in a haddock fishery at Rockall when occasional good year classes recruit to the Division VIb stock. Although young saithe are caught by coastal trawlers, the fishery for saithe essentially takes place offshore to the west and northwest of Scotland. Traditionally, this fishery has largely been operated by the larger deep-sea French trawlers. However, the number of these vessels has declined in recent years due to economic difficulties. In the late 1980s, some of these vessels diverted their activity toward deep-sea species, notably orange roughy, but this fishery has become less profitable recently. To a large extent, the roundfish fishery in Division VIa is an extension of the similar fishery in the North Sea.

Some 200 Scottish trawlers also take part in fisheries for *Nephrops* on inshore grounds, using 70 mm mesh with 80 mm square mesh panel. These boats also land small quantities of haddock, cod, whiting and small saithe, but discard larger numbers of whiting and haddock.

The pelagic fishery for herring is mainly operated by UK vessels in the north, and by Irish vessels in a roe fishery in the south. Recent trends in the northern fishery are unclear due to substantial misreporting of catches from the North Sea and between the northern and southern stocks. The Clyde herring fishery has declined sharply in recent years as the stock has suffered from a series of low recruitments. Recent TACs have not been taken and the catches have been less than 1,000 t since 1991.

There is a directed trawl fishery for mackerel and horse mackerel in the area. The mackerel fishery mainly takes place in the fourth and first quarter of the year, when the mackerel is returning from the feeding area to the spawning area. The horse mackerel is mainly fished in the second half of the year.

The industrial fisheries in Division VIa are fairly marginal compared to the North Sea. The Scottish sandeel fishery

started in the early 1980s, peaking in 1986 and 1988. It is rather irregular, depending on the availability of the resource and of processing facilities at Shetland, Hebrides and Faroe. By-catches in this fishery are very small. The Norway pout fishery is mainly conducted by Danish vessels and is an extension of the North Sea fishery.

State of stocks

The assessments of demersal and herring stocks in Sub-area VI continued to be hampered by the poor quality of catch data due to misreporting. Estimates of misreported catches in 1992-1994 were available or derived by analysis of survey data for Division VIa haddock and whiting, but were not considered reliable for cod.

In 1994, the stocks of cod and saithe were still close to their lowest recorded spawning stock levels, and they are considered to be outside safe biological limits. A slight improvement is observed in the state of the haddock stocks in Divisions VIa and VIb, but their spawning biomass remains below average. Although the spawning biomass of whiting in Division VIa appears to have increased from its record low levels in 1989-91, the assessment based on landings data was not deemed sufficiently reliable to ascertain the status of this stock in relation to safe biological limits. Fishing mortality on all roundfish stocks continues to fluctuate about high levels. The 1992 year-class of cod and whiting has been amongst the lowest recorded for each stock, and all year classes of saithe since 1984 have been close to or below average.

The evaluation of the status of the gadoid stocks remains unchanged with fishing rates excessively high and spawning biomasses critically low. Management advice concerning the roundfish stocks still points to the need to reduce fishing effort, as the considerable misreporting which took place in recent years clearly indicates that controls on landings via TACs are not effective in achieving the reduction in fishing mortality required to rebuild the stocks.

It is likely that the stocks of haddock and saithe in Division VIa are closely related to those of the same species in the North Sea, whereas the stocks of cod and whiting are more probably related to those of the northern part of the Irish Sea.

Data are not sufficient yet to assess the stock status of megrim and anglerfish in Sub-area VI. A directed fishery for these species has developed in recent years and this expansion is further accelerated by fishing effort being diverted onto these stocks due to restrictions on the fisheries for other stocks in the area.

The state of the stocks of herring in Division VIa (North and South) is uncertain, but there is evidence that the Clyde herring stock remains very low. The level of exploitation

on sandeel is moderate and the SSB of this stock appears to be high.

The horse mackerel fishery exploits the Western stock. This

stock is declining due to low levels of recruitment since 1982. The rich 1982 year class still contributes over 50% of the catches.

3.7.2 Cod

3.7.2.a Cod in Division VIa (West of Scotland)

Catch data (Table 3.7.2.a.1):

Year	Rec. TAC	Agreed TAC ¹	Official Landings	ACFM catch
1987	22.0	22.0	19.2	19.0
1988	16.0	18.4	19.2	20.4
1989	16.0	18.4	15.3	17.2
1990	15.0	16.0	11.8	12.2
1991	- ²	16.0	10.6	10.9 ³
1992	- ²	13.5	9.0	9.1 ³
1993	- ²	14.0	11.4	10.3 ³
1994	- ²	13.0	n/a	9.0 ³
1995	- ²	13.0		

¹TAC is for the whole of Sub-area VI. ²Reduction in fishing effort. ³Not including misreporting. Weights in '000 t.

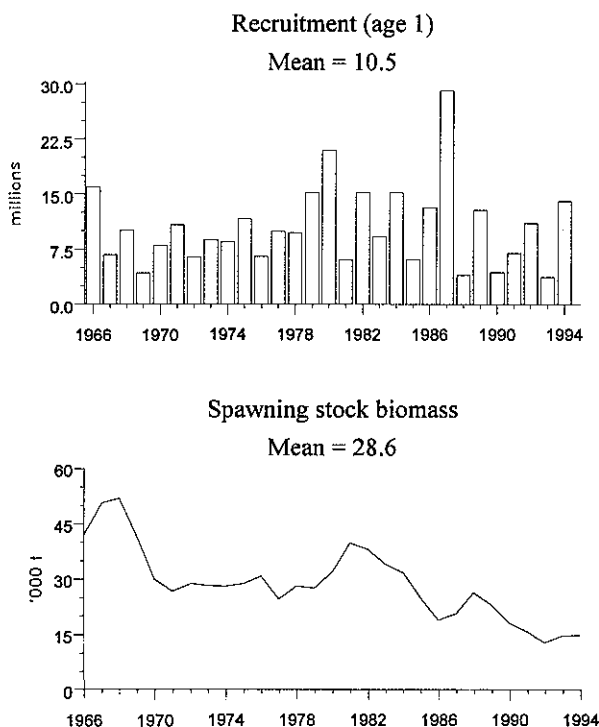
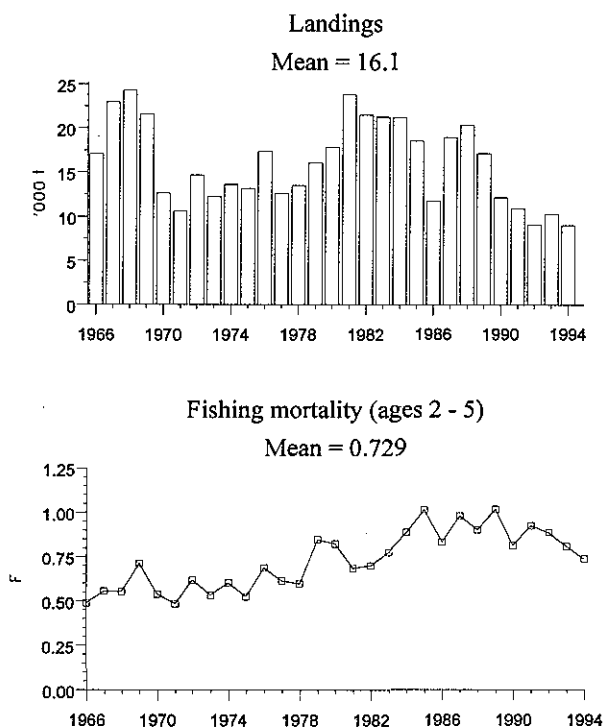
Historical development of the fishery: Cod is mainly taken in a mixed fishery directed at cod, haddock and whiting. This fishery is dominated by Scottish light trawlers. Cod is also taken as a by-catch in a French directed saithe fishery. The fishery has been influenced by catch restrictions in recent years leading to considerable misreporting.

State of stock: ACFM considers that this stock is outside safe biological limits.

SSB has decreased since 1988 to a historical low in 1992 and is indicated to have remained close to that level recently. The occasional strong year classes have had progressively less impact on SSB due to higher levels of fishing mortality.

Details in Table 3.7.2.a.2

Forecast for 1996: A catch forecast is not considered reliable due to misreporting in recent years.



Management advice: ACFM recommends that the fishing effort in 1996 in the directed fisheries on roundfish except saithe (cod, haddock and whiting) in Division VIa are reduced significantly, and on a sustained basis, relative to effort levels in the most recent years.

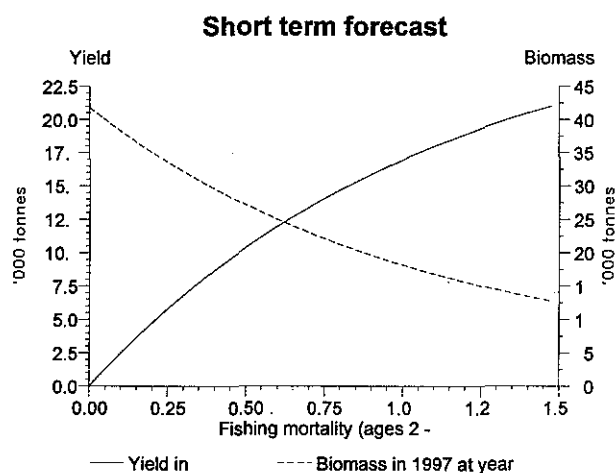
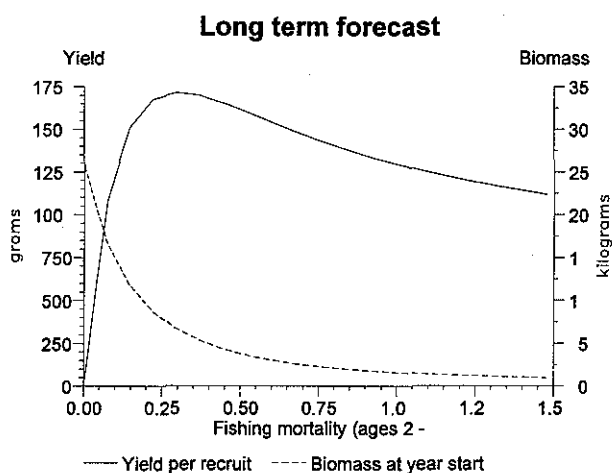
Special comments: SSB should be rebuilt to a level at which there is a higher probability that good year classes are produced. Available information indicates that this level is about 25,000 t. ACFM has recommended for several years that fishing effort in the directed fisheries for cod, haddock and whiting in Division VIa be reduced to 70% of the level in 1989. This was because of the low levels of spawning biomass in all stocks and because continued fishing, after restrictive TACs are exhausted, would cause discarding or under-reporting. Because of uncertainties due to misreporting, ACFM is not in a position to provide the exact rate of effort reduction required to reach this level in the short term. However, the indications are that it should be at least 20%.

The extent of recent misreporting does not invalidate the analysis of past trends but a catch prediction cannot be given. If the problem continues it may no longer be possible to advise on this stock in the future.

Data and assessment: Analytical assessment based on landings-at-age, commercial CPUE and survey CPUE data. Catch and effort data in 1991–1994 are considered poor due to misreporting.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.7.2.b Cod in Division VIb (Rockall)

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Catch data (Table 3.7.2.b.1):

Special comments: There is no information on the stock status of Division VIb cod and recent catches are considered unreliable due to misreporting. Official catch data are also incomplete. If a precautionary TAC is required for this Division, to be combined with management measures agreed for Division VIa, it should be based on the more reliable catches reported earlier which were about 1,000 t per year.

3.7.3 Haddock

3.7.3.a Haddock in Division VIa (West of Scotland)

Catch data (Tables 3.7.3.a.1):

Year	Rec. TAC	Agreed TAC ¹	Off. Indgs	ACFM Indgs ¹	Disc. slip.	ACFM catch ³
1987	<23.0	32.0	27	27.0	16.2	43.2
1988	25.0	35.0	21	19.1	9.0	28.0
1989	15.0	35.0	n/a	16.7	3.2	19.9
1990	14.0	24.0	n/a	10.1	5.4	15.5
1991	- ²	15.2	n/a	10.5	9.2	19.8
1992	- ²	12.5	n/a	11.4	9.4	20.8
1993	- ²	17.6	n/a	19.1	16.9	36.0
1994	- ²	16.0	n/a	14.8	11.6	26.4
1995	- ²	21.0				

¹TAC is set for Divisions VIa and VIb combined with restrictions on quantity that can be taken in VIa from 1990. ² Reduction in fishing effort. ³ Adjusted for misreporting. Weights in '000 t.

Historical development of the fishery: Haddock is mainly taken in a mixed fishery directed at cod, haddock and whiting. This fishery is dominated by Scottish light trawlers. The fishery has been influenced by catch restrictions in recent years leading to considerable misreporting.

State of stock: ACFM considers that the stock is within safe biological limits.

The spawning stock has declined since 1982 to a historical low in 1991, but has increased to 80% of the long-term mean in 1994. Fishing mortality has been generally decreasing since 1987 and is indicated to be in 1994 about 74% of the level in 1989. Recruitment since 1989 has been above average except in 1993. There is no evidence that recruitment is reduced at the lowest observed SSBs.

Details in Table 3.7.3.a.2

Forecast for 1996:

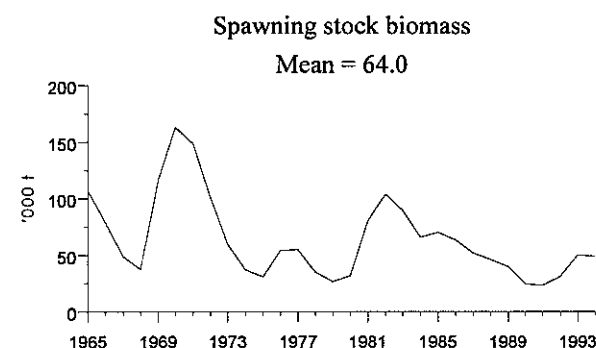
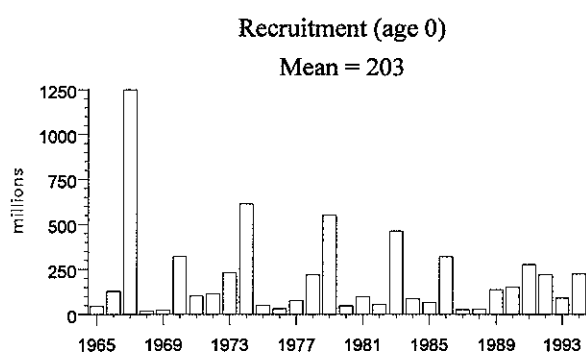
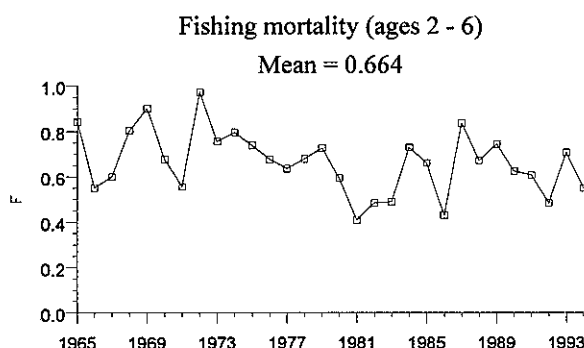
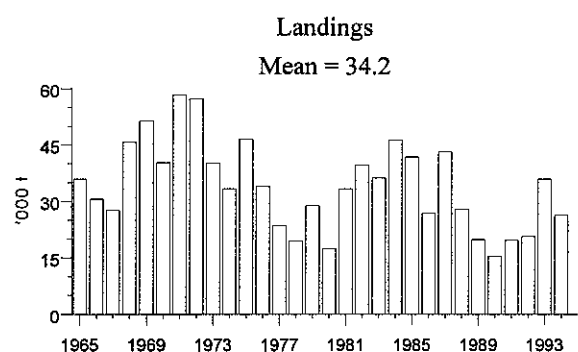
SSB(95) = 54, F(95) = 0.55, Basis: F(95) = F(94)

Catch(95) = 31, Landings (95) = 21

Option	Basis	F (96)	SSB (96)	Catch (96)	Landings (96)	SSB (97)
A	0.4 F ₉₄	0.22	54	13	9	73
B	0.6 F ₉₄	0.33		19	13	66
C	0.8 F ₉₄	0.44		24	16	59
D	1.0 F ₉₄	0.55		29	19	54
E	1.2 F ₉₄	0.66		33	22	49

Weights in '000 t.

For options A, B and C SSB will increase compared to 1995. For option D SSB will remain at the 1995 level, and for option E it will decrease but remain well above the lowest recorded level.



Management advice: There are no long-term gains in yield by increasing fishing mortality above the current level. **ACFM recommends that the fishing effort in 1996 in the directed fisheries on roundfish except saithe (cod, haddock and whiting) in Division VIa is reduced significantly, and on a sustained basis, relative to effort level in most recent years.**

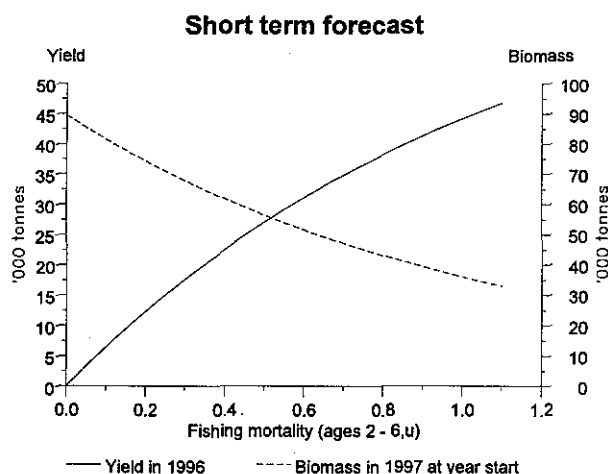
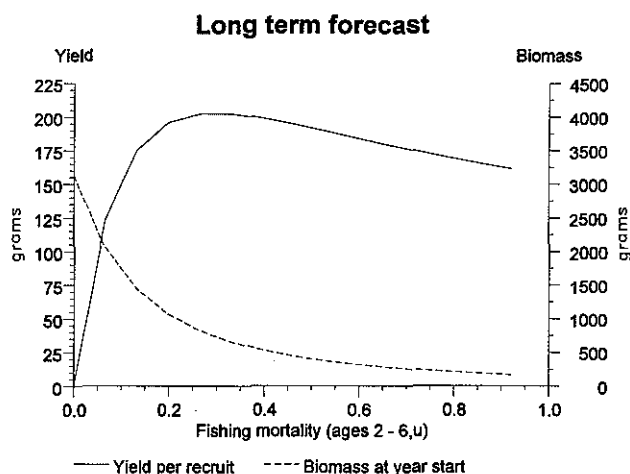
Special comments: Although misreporting continues to be a problem for assessing the state of the stock, SSB appears to have returned within safe biological limits. This is due to the recruitment of good year classes in recent years and also to an apparent reduction of fishing mortality to about 70 % of the 1989 level, which corresponds to last years ACFM recommendations. Therefore, for the haddock stock in isolation, effort reductions are not required in the short term. However, management decisions for this stock should be viewed in connection with those for cod and whiting that are taken in the same fisheries. In addition the fisheries and stocks in Divisions VIa and IV a,b are closely linked and therefore **ACFM recommends effort reduction.**

Discards constitute an important part of the catch of haddock. Any measure to reduce discards would be beneficial for yield.

Data and assessment: Analytical assessment based on catch, effort and survey data. Estimates of misreporting and non-reporting of landings (up to 60% of recorded landings) in recent years included in assessment. Continued uncertainty about the true level of catch and effort.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995(C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.7.3.b Haddock in Division VIb (Rockall)

Catch data (Tables 3.7.3.b.1):

Year	Rec. TAC	Agreed TAC ¹	Official Landings	ACFM catch
1987	10.0		8.0	8.4
1988	10.0		7.6	7.9
1989	18.0		n/a	6.7
1990	5.5		n/a	3.9
1991	5.5		n/a	5.7
1992	3.8 ²		n/a	5.3
1993	3.0		n/a	4.8
1994	- ³		n/a	5.7 ⁴
1995	5.1 ⁵			

¹TAC is set for Divisions VIa and VIb combined with restrictions on quantity that can be taken in VIa from 1990.

²Precautionary. ³Precautionary TAC in line with recent catches. ⁴Including misreporting. ⁵Landings at *status quo* F. Weights in '000t.

Historical development of the fishery: The Rockall fishery is presently dominated by Scottish vessels. The fishery is to a large degree opportunistic and takes place in the summer if fishing at Rockall is more profitable than in the North Sea or West of Scotland. There is a growing tendency for some vessels to exploit this stock on a more regular basis.

State of stock: The time series is too short to judge the state of the stock with respect to safe biological limits.

Details in Table 3.7.3.b.2

Forecast for 1996:

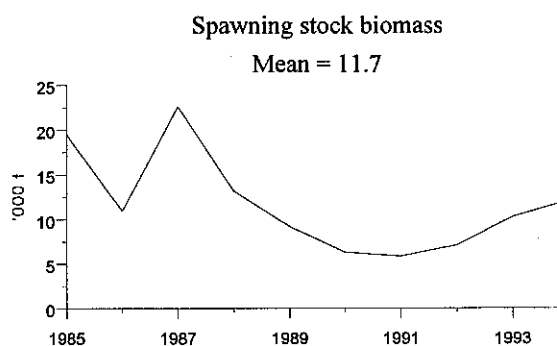
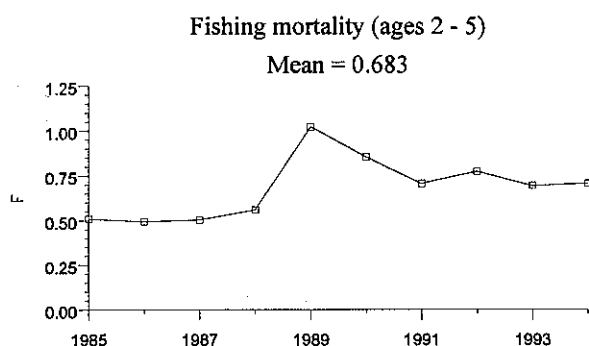
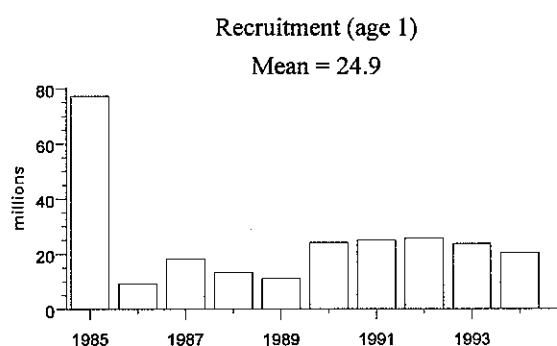
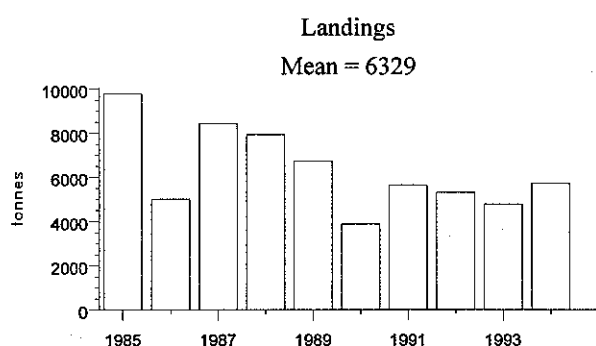
SSB(95) = 13.9, F(95) = 0.71, Basis: F(95) = F(94),
Catch(95) = 7.4, Landings (95) = 7.4

Option	Basis	F (96)	SSB (96)	Catch (96)	Landings (96)	SSB (97)
A	0.4 F ₉₄	0.28	12.5	3.4	3.4	15.7
B	0.6 F ₉₄	0.43		4.7	4.7	14.2
C	0.8 F ₉₄	0.57		5.9	5.9	12.9
D	1.0 F ₉₄	0.71		6.9	6.9	11.8
E	1.2 F ₉₄	0.85		7.8	7.8	10.8

Weights in '000 t.

For options A and B, SSB will increase compared to 1995. For options C and D, SSB will decrease, but will remain above average. For option E, SSB will decrease but will remain above the lowest observed level.

Management advice: ACFM notes that no gains in long-term yield will be obtained from an increase in fishing mortality.

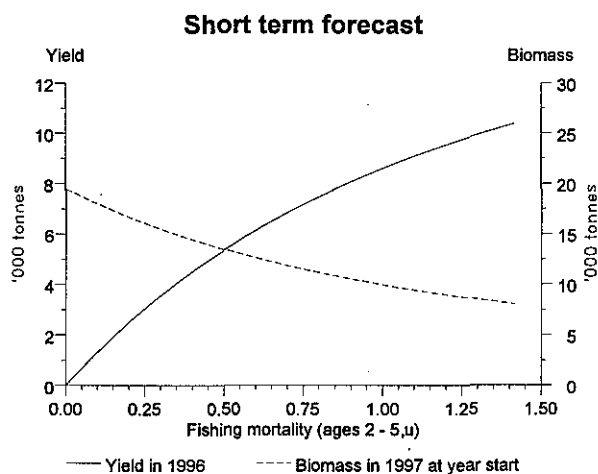
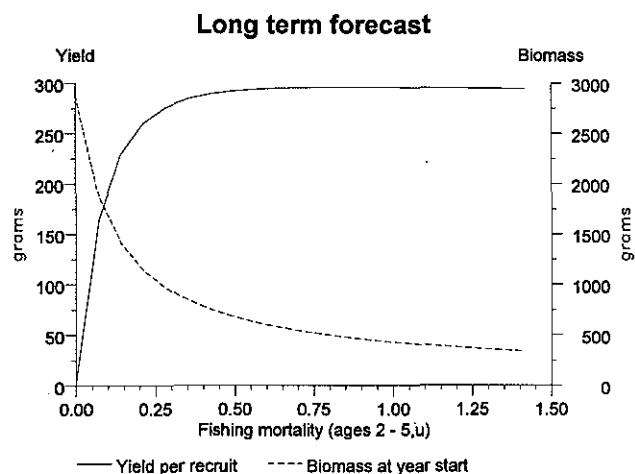


Special comments: The fishery in Division VIb is closely associated with fisheries in Division VIa and the fishery at Rockall is to a considerable extent opportunistic. This makes it difficult to predict actual fishing mortality levels as fishing fleet behaviour will be dependent on fishing opportunities elsewhere.

Data and assessment: Analytical assessment based on landings, effort and survey data. Continued uncertainty about the true level of catch and effort due to misreporting of landings. Estimates of misreporting included for 1994. No information available on discards. Forecasts take account of September 1995 survey results.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.7.4 Whiting

3.7.4.a Whiting in Division VIa (West of Scotland)

Catch data (Tables 3.7.4.a.1.):

Year	Rec. TAC	Agreed TAC ¹	Official landings	ACFM landings
1987	15.0	16.4	12.4	11.5
1988	15.0	16.4	11.9	11.4
1989	13.0	16.4	7.7	7.5
1990	11.0	11.0	6.0	5.6
1991	- ²	9.0	6.9	6.7 ³
1992	- ²	7.5	6.0	9.7 ⁴
1993	- ²	8.7	6.9	10.2 ⁴
1994	- ²	6.8	n/a	13.0 ⁴
1995	- ²	6.8		

¹TAC is set for Divisions VIa and VIb combined. ²Reduction in fishing effort. ³Not including misreporting. ⁴Including ACFM estimates of mis-reporting. Weights in '000 t.

Historical development of the fishery: Whiting is mainly taken in a mixed fishery directed at cod, haddock and whiting. This fishery is dominated by Scottish light trawlers.

State of stock: The stock may still be outside safe biological limits. The assessment is considered unreliable since it is based on landings data only, whereas discards are estimated to account for 35 to 77% of the total catch depending on the year. The survey data available since 1985 indicate that SSB has been increasing recently from its very low level in 1989-91, but fishing mortality appears to have increased also since 1991. The 1987 and 1992 year classes are indicated to be poor.

Forecast for 1996: Not reliable. A *status quo* projection indicates that landings in 1996 may be of the order of 12,500 t.

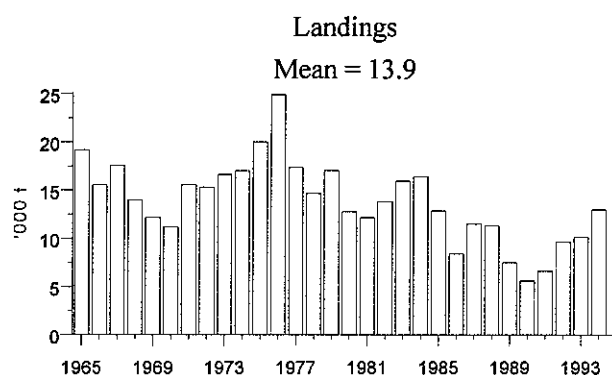
Management advice: ACFM recommends that the fishing effort in 1996 in directed fisheries on roundfish except saithe (cod, haddock and whiting) in Division VIa is reduced significantly and on a sustained basis, relative to effort levels in the most recent years.

Special comments: Although the state of the stock cannot be assessed, the available information indicates that the reduction in fishing mortality recommended by ACFM for several years has not taken place. The survey data indicate an increase of SSB, but these data are only available for the last decade during which the stock has been at a low level compared to the previous decades.

Data and assessment: Analytical age-based assessment, using landings-at-age data, CPUE from commercial fleets and indices from research vessel surveys. Estimates of misreporting have been taken in the assessment, but no account has been made of the large amount of discards. The assessment was not considered to reliably reflect the development of the stock and the effects of fishing.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Details of landings in Table 3.7.4.a.2.



3.7.5 Saithe in Sub-area VI (West of Scotland and Rockall)

Catch data (Table 3.7.5.1):

Year	Rec. TAC	Agreed TAC	Official landings	ACFM catch
1987	23	27.8	32.5	31.4
1988	35	35	32.8	34.2
1989	20	30	n/a	25.6
1990	24	29	n/a	19.9
1991	21	22	n/a	17.0
1992	<16	17	n/a	11.8
1993	6.3	14	n/a	14.7
1994	LPL ¹	14	n/a	10.4
1995	- ²	16		

¹LPL=Lowest possible level. ²Reduction in fishing effort. Weights in '000 t.

Historical development of the fishery: The fishery consists largely of a French fishery operating on the shelf edge and a Scottish fishery operating inshore. The directed fishery is relatively new, starting in the early 1970's. The number of French deep-sea trawlers participating in this fishery has declined in recent years. The fishery is linked to similar fisheries in the North Sea.

State of stock: ACFM considers that this stock is outside safe biological limits.

The spawning biomass is close to the lowest recorded level. All year classes since 1986 are estimated to have been below average with the 1990 year class being the lowest recorded.

Details in Table 3.7.5.2.

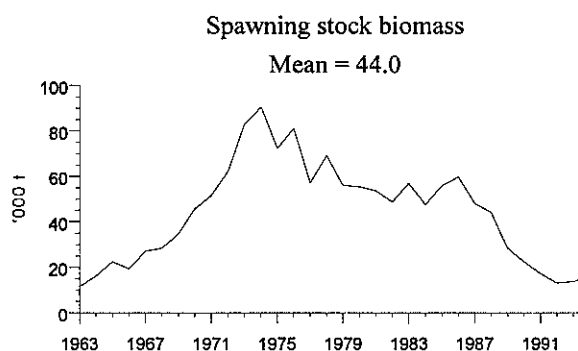
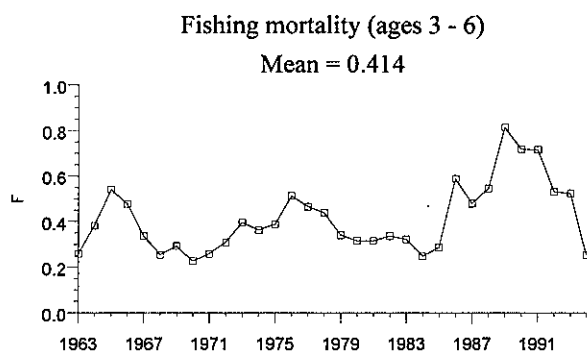
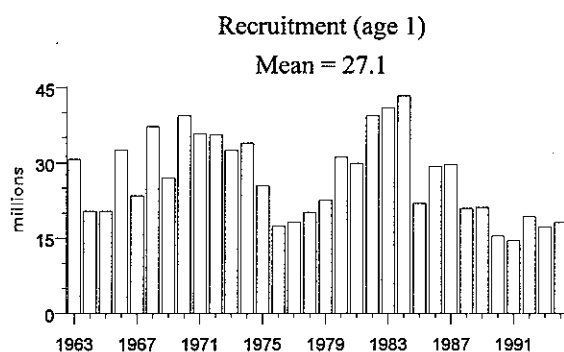
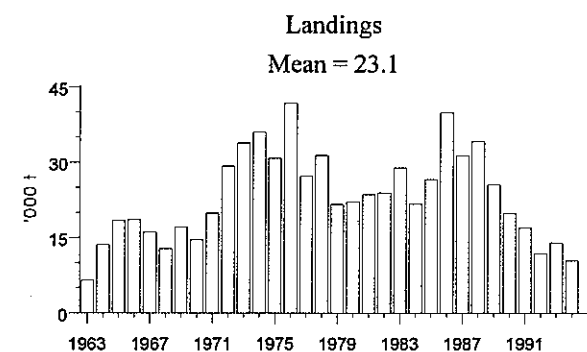
Forecast for 1996:

SSB(95) = 18, F(95) = 0.25, Basis: F(95) = F(94), Catch(95) = 8.9, Landings (95) = 8.9

Option	Basis	F (96)	SSB (96)	Catch (96)	Lnogs (96)	SSB (97)
A	0.4 F ₉₄	0.10	24	4.4	4.4	33
B	0.6 F ₉₄	0.15	24	6.4	6.4	32
C	0.8 F ₉₄	0.20	24	8.4	8.4	30
D	1.0 F ₉₄	0.25	24	10.2	10.2	28
E	1.2 F ₉₄	0.30	24	12.0	12.0	27

Weights in '000 t.

The forecast is to a large degree an average prediction since a constant value was used for the recruitment of year classes 1993-1995 for which there is no information available. The recruitment is an average for the recent period (year classes 1987-92) during which recruitment has been consistently low. Since maturity takes place at age 5, the SSBs predicted in the short term are not dependent on the values used for incoming recruitments.



Management advice: To allow the stock to recover ACFM recommends that fishing mortality in 1996 should not be allowed to increase above the 1994 level.

Special comments: The forecasts assume that fishing mortality is maintained at the very low level estimated for 1994 (0.25). This represents a sharp drop from the 1992 and 1993 values of about 0.5. However, this estimate is uncertain since the 1994 catch and effort data were missing for the French Brittany fleet which is a major component of the fishery. In addition, successive assessments have tended to underestimate fishing mortality in the last year in this stock.

This stock is associated with the North Sea stock, both in terms of stock distribution and in terms of some of the fisheries exploiting the stocks.

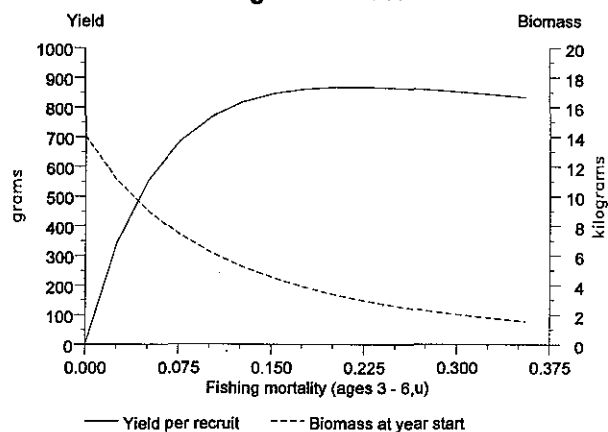
Caution should be exercised in the interpretation of time series of fishing mortality and SSB since the catch data prior to 1970 are of poor quality.

Data and assessment: Analytical assessment of landings-at-age data using commercial CPUE series. Tuning data set is of poor quality and no data were available for France in 1994. No independent estimates of recruitment.

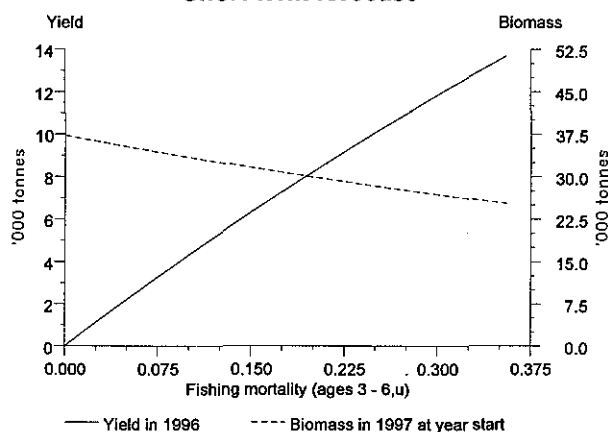
Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass

Long term forecast



Short term forecast



3.7.6 Megrim in Sub-area VI

Catch data (Table 3.7.6.1):

Year	Rec. TAC	Agreed TAC ¹	Official landings	ACFM catch ²
1987	-	4.4	3.9	-
1988	-	4.84	4.5	-
1989	-	4.84	n/a	-
1990	-	4.84	n/a	2.9
1991	-	4.84	n/a	2.7
1992	-	4.84	n/a	2.3
1993	-	4.84	n/a	2.3
1994	-	4.84	n/a	n/a
1995	-	4.84		

¹Vb(EC), VI, XII and XIV. ²Division VIa only. Weights in '000 t.

Historical development of the fishery: Until recently megrim was mainly taken as a by-catch in bottom trawl groundfish fisheries but a directed fishery has developed in recent years. Restrictive TACs for other species in Division VIa have led to increased fishing pressure on megrim in that area.

State of stock: Not known. Yield-per-recruit analyses indicate that the stock is fully exploited.

Forecast for 1996: Not available.

Special comments: The megrim in Sub-area VI consists of two species, *Lepidorhombus whiffiagonis* and *L. boscii*, which are not distinguished in the catches. The majority of the landings are *L. whiffiagonis*.

Data and assessment: Length frequency and age composition data are only available for 1990–1993. No further data were available for 1994. Data are insufficient to permit an analytical assessment.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

3.7.7 Anglerfish in Sub-area VI

Catch data (Table 3.7.7.1):

Year	Rec. TAC	Agreed TAC ¹	Official landings	ACFM catch ²
1987	-	7.8	5.2	-
1988	-	8.6	7.7	-
1989	-	8.6	n/a	-
1990	-	8.6	n/a	5.8
1991	-	8.6	n/a	5.4
1992	-	8.6	n/a	4.6
1993	-	8.6	n/a	5.0
1994	-	8.6	n/a	n/a
1995	-	8.6		

¹Vb(EC), VI, XII and XIV. ²Division VIa only. Weights in '000 t.

Historical development of the fishery: Until recently anglerfish was mainly taken as a by-catch in bottom trawl groundfish fisheries but a directed fishery has developed in recent years. Restrictive TACs for other species in Division VIa have led to increased fishing pressure on anglerfish in that area.

State of stock: Not known. Yield-per-recruit analyses indicate that the stock is fully exploited. The rapid decline in catches of older fish may be indicative of heavy exploitation and/or a shift in exploitation pattern.

Forecast for 1996: Not available.

Management advice: Indications are that the exploitation of this stock is increasing rapidly and that the stock is being affected accordingly. A precautionary TAC should take this into consideration by setting levels which do not exceed recent catches.

Special comments: The anglerfish in Sub-area VI consists of two species, *Lophius piscatorius* and *L. budegassa*, which are not distinguished in the catches. The majority of the landings are *L. piscatorius*.

Data and assessment: Length frequency and age composition data are only available for 1990–1993. No further data were available for 1994. No analytical assessment carried out. There may be a misreporting problem, possibly due to a lack of catch restrictions on anglerfish in the adjacent North Sea.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995(C.M.1996/Assess:1).

3.7.8.a Herring in Division VIa (North)

Catch data (Table 3.7.8 a.1):

Year	Rec. TAC	Agreed TAC	Disc. slip.	ACFM catch ¹
1987	38-55	49.7		63.0
1988	46	49.8		47.4
1989	58	58	1.6	53.0
1990	61	75	1.3	70.0
1991	57	62	1.2	50.6
1992	<62	62	0.2	51.6
1993	54-58	62	0.8	56.2
1994	50-60	62	0.7	54.7
1995	60 ²	77		

Weights in '000 t. ¹Misreporting believed to be important.

² Catch at *status quo* F.

Historical development of the fishery: Exploitation has decreased since the mid-1980s, with reported catches remaining approximately constant during a period of good recruitment. In recent years an increasing proportion of the catches has been misreported from Division IVa into this area.

State of stock: Lightly exploited and considered to be within safe biological limits, but the absolute level of stock size cannot be calculated.

(Details in Table 3.7.8 a.2).

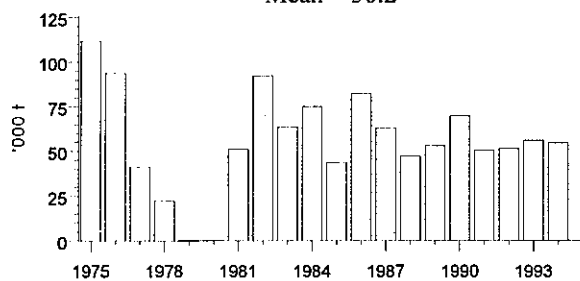
Forecast for 1996: No forecast was made on account of uncertainty in total catches in recent years.

Special comments: There is good evidence of misreporting (into this area from the North Sea). Correction of the assessment for this would result in a smaller stock size.

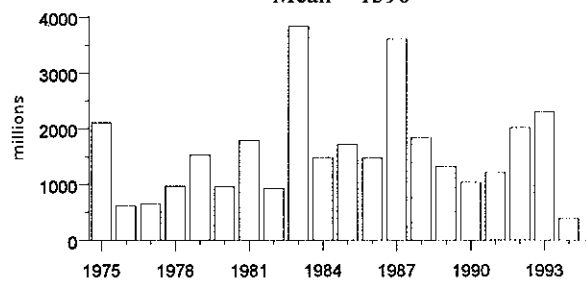
Data and assessment: Recent catches poorly known. Assessment based on reported catches, acoustic survey and larval surveys. Misreporting is believed to be substantial.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13).

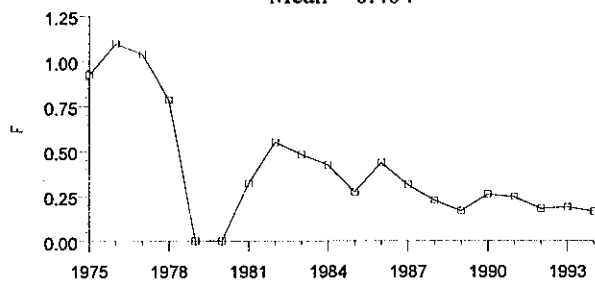
Landings
Mean = 56.2



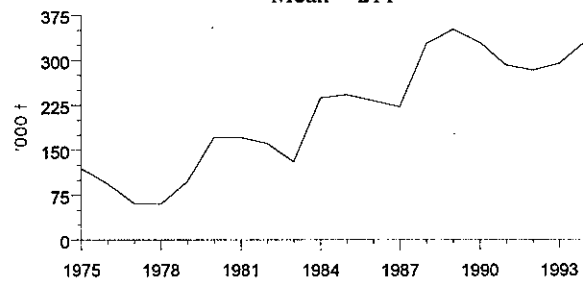
Recruitment (age 1)
Mean = 1590



Fishing mortality (ages 3 - 6)
Mean = 0.404



Spawning stock biomass
Mean = 211



3.7.8.b Clyde herring (Division VIa)

Catch data (Table 3.7.8 b.1):

Year	Rec. TAC	Agreed TAC	Disc. slip.	ACFM catch
1987	3.5	3.5	0.4	3.6
1988	3.2	3.2	0.2	1.9
1989	2.9-3.4	3.2		2.3
1990	2.6	2.6		2.3
1991	2.9	2.9		0.7
1992	1.6	2.3		0.9
1993	LPL ¹	1.0		0.9
1994	LPL ¹	1.0		0.6
1995	LPL ¹	1.0		

¹Lowest possible level. Weights in '000 t.

Historical development of the fishery: The spring-spawning stock supported a strong and locally-important fishery from 1955-1974 at catch levels ranging from 4,000 to 15,000 t. Catches then declined but increased again in the 1980s. A TAC of 3,000 t was set in 1984 but was exceeded in that year and the following three years. Since then catches have declined to below the 1,000 t TAC. Recent TACs have not been taken and there has not been great interest in fishing during the periods it has been permitted.

State of stock: The Clyde herring consists of two stocks. The state of the spring-spawning stock is uncertain but it currently suffers from low recruitment and fishing at the current low level is likely to reduce the stock size to a historically low level. When last assessed the spring-spawning stock was at a very low level, but there have been some indications of recovery including increased numbers of 1, 2 and 3-ringers in the catches in 1994. It is not possible to assess the immigrant autumn-spawning stock. The fishing mortality level is not known.

Forecast for 1996: Not available.

Management advice: ACFM recommends that, until recruitment has improved, the fishery should be at the lowest possible level.

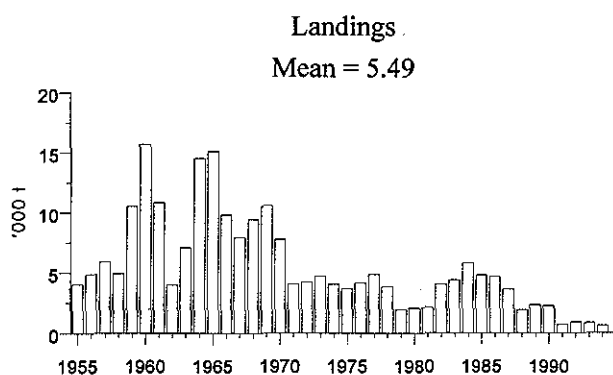
Special comments: When last assessed the SSB was at a very low level, and there is no new information that the situation has changed significantly. ACFM therefore reiterates its advice of last year.

There is no new assessment for this stock. Fishery-independent survey data are required if an analytical assessment is to be provided.

Data and assessment: Catch at age data are available, but there is no fishery-independent abundance indicator for 1994.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13).

(Details in Table 3.7.8 b.1).



3.7.9 Norway pout in Division VIa

Catch data (Table 3.7.9.1):

Year	Off. Indgs.
1987	38.3
1988	6.7
1989	28.2
1990	3.3
1991	4.3
1992	5.1
1993	7.3 ¹
1994	14.8
1995	

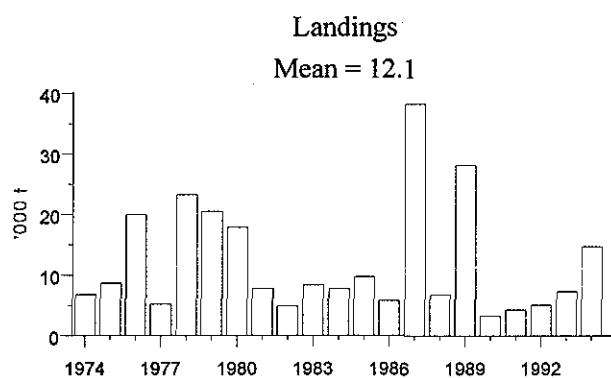
Weights in '000 t.

Historical development of the fishery: Small mesh trawl fishery operated by Danish, UK and Faroese vessels. Catches are highly variable.

State of stock: Unknown.

Data and assessment: The only data available are official landings statistics. No assessment.

Source of information: Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1995 (C.M.1996/Assess: 6).



3.7.10 Sandeel in Division VIa

Catch data (Table 3.7.10.1):

Year	Off. Indgs	ACFM catch
1987	14.5	14.5
1988	24.5	24.5
1989	18.8	18.8
1990	16.5	16.5
1991	8.5	8.5
1992	4.9	4.9
1993	6.2	6.2
1994	10.6	10.6
1995		

Weights in '000 t.

Historical development of the fishery: The fishery started in 1980 and is operated predominantly by local Scottish vessels during the summer months. Effort has declined since 1989 and is currently at a very low level partially due to the lack of a local processing outlet.

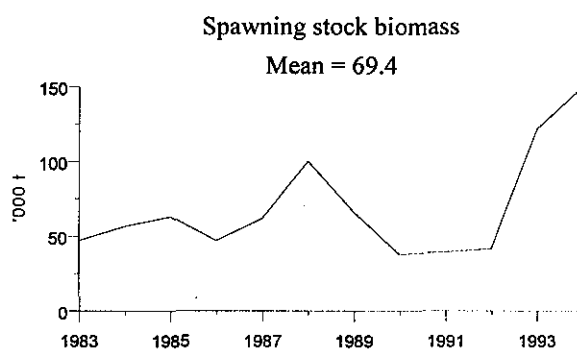
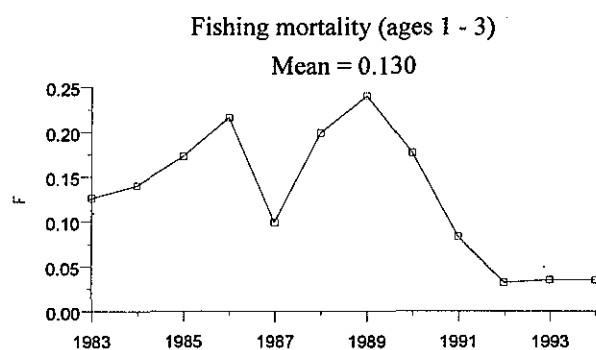
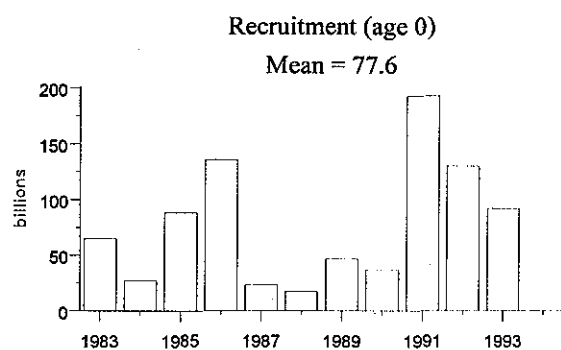
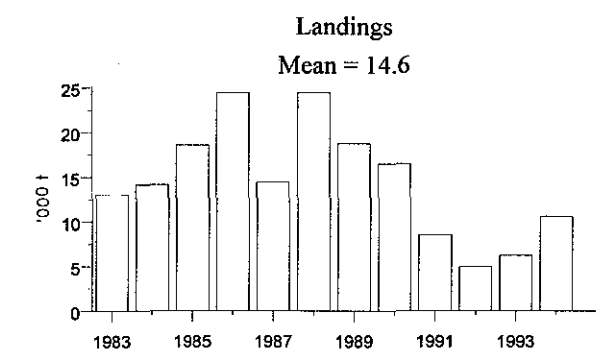
State of stock: The stock appears to be within safe biological limits. SSB is at a high level and fishing mortality at a very low level.

Details in Table 3.7.10.2

Forecast for 1995: Not available.

Data and assessment: Catch-at-age and effort data available since 1983. An analytical assessment was done utilizing effort data. However, due to the low level of fishing mortality the assessment is only indicative of the broad trends in the stock.

Source of information: Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skaggeak October 1995 (C.M.1996/Assess:6).



3.7.11 Blue ling, ling and tusk in Sub-areas V, VI and XIV

Catch data: Nominal catches as reported to ICES are given for blue ling, ling and tusk by division in Tables 3.7.11.1-3 respectively.

Special comments: No new information on these species is currently available. ACFM will provide any new information available at its meeting in May 1996.

3.7.12.a *Nephrops* in Division VIa

Units included in recommended Management Area: a) North Minch (Unit 11), b) South Minch (Unit 12) and c) Firth of Clyde (Unit 13).

Catch data (Tables 3.7.12 a.1-3.7.12 a.2) :

Year	Rec TAC	Agreed TAC	ACFM catch
1987		16.0	11.2
1988		16.0	12.5
1989		16.0	11.0
1990		16.0	10.1
1991	11.7	13.5	10.6
1992	~11.4	12.0	10.8
1993	~11.3	12.0	11.4
1994	11.3	12.6	10.8
1995	11.3	12.6	

(Weights in '000 t)

Historical Development of the Fishery: Landings and effort in all three functional units have increased since the 1960s (graphs a, b, f, g, k, l). In the North Minch landings have fluctuated since the mid-1980s (graph a). Landings in South Minch relatively stable since 1988 (graph f), while those from the Clyde have fluctuated without trend (graph k).

State of stock: a) N.Minch: LPUE fluctuating without obvious trend (graph c). Mean size fluctuation - no trend (graph d). Effort increased since 1990, but declined in 1994 (graph b). Yield per recruit analysis suggests that F is above F_{max} in males and below F_{max} in females (graph e).

b) S. Minch: LPUE fluctuating without trend (graph h). Mean size and effort fluctuating (graphs g, i). Yield per recruit analysis suggests that current F is above F_{max} in males but below F_{max} in females (graph j).

c) Firth of Clyde: LPUE at a low level, but relatively constant since 1989 (graph m). Effort at a high level up to 1993, but fell sharply in 1994 (graph l). Mean size fluctuating (graph n). Current F above F_{max} in males and below F_{max} in females (graph o). Age-based assessment suggests a decline in male biomass.

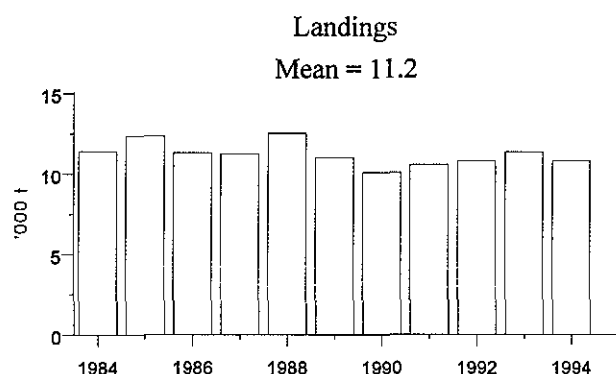
Management advice: ACFM advises a precautionary TAC of 11,300 t in 1996 and 1997.

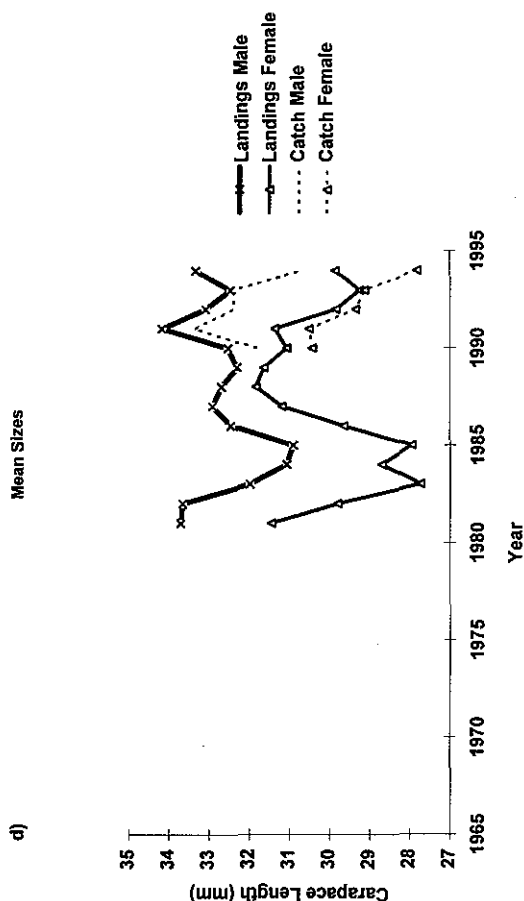
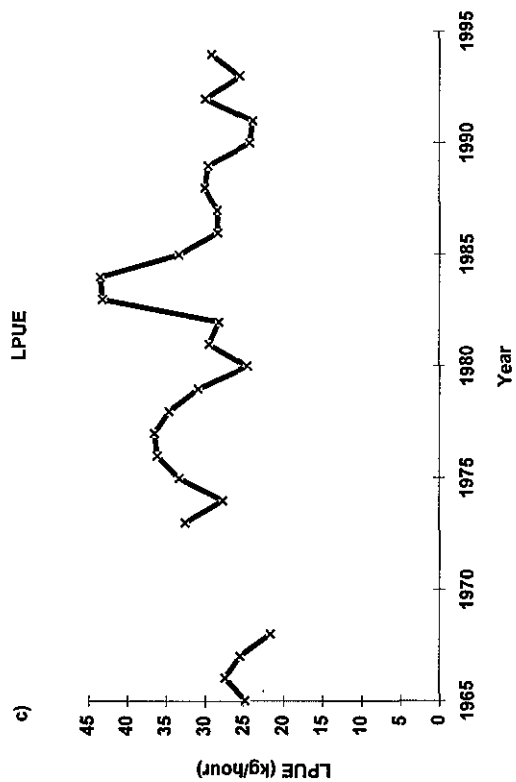
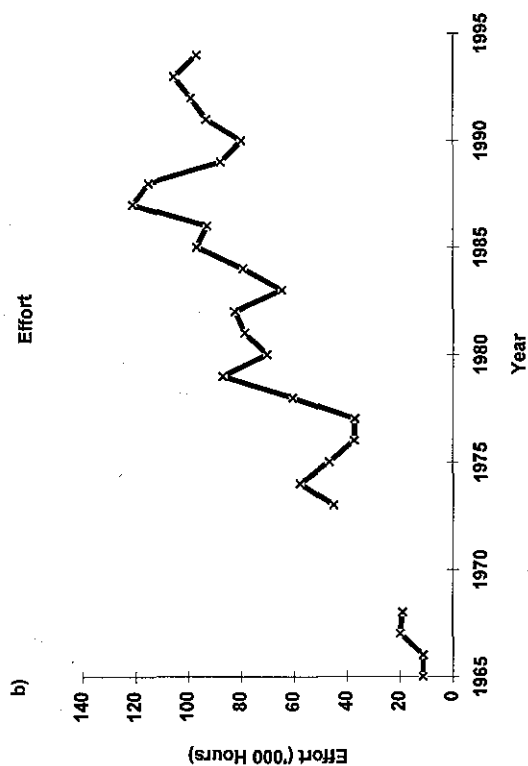
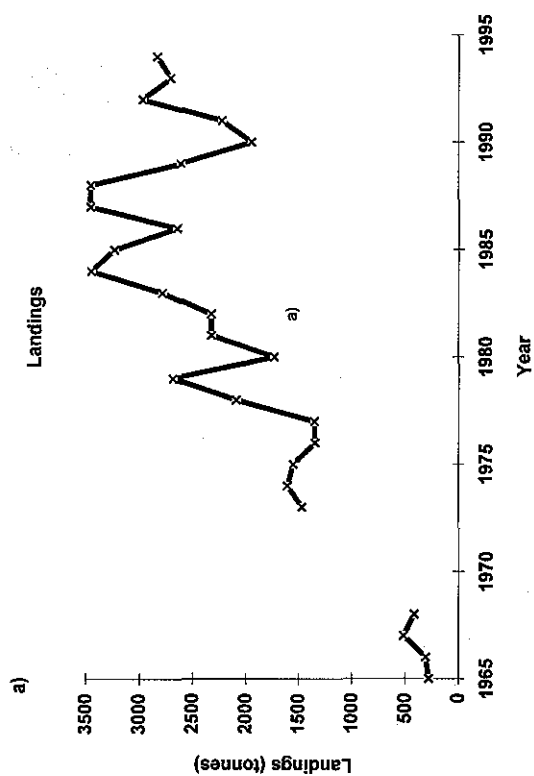
Special comments: ACFM advised a precautionary TAC of 11,300t for the Management Area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. Higher yields could be obtained in the long term by a reduction of effort. The assessment results this year are not comparable to last year's results, because in functional unit 12 there has been a change in the area boundary (Figure 2.4.3) and in the allocation of catches.

Data and assessment: LPUE, mean size, landings/area and effort/area data available for all units. Yield per recruit analysis repeated and age-based assessment for Clyde. The VPA was not considered reliable - very low F on females. No assessments of creel fisheries.

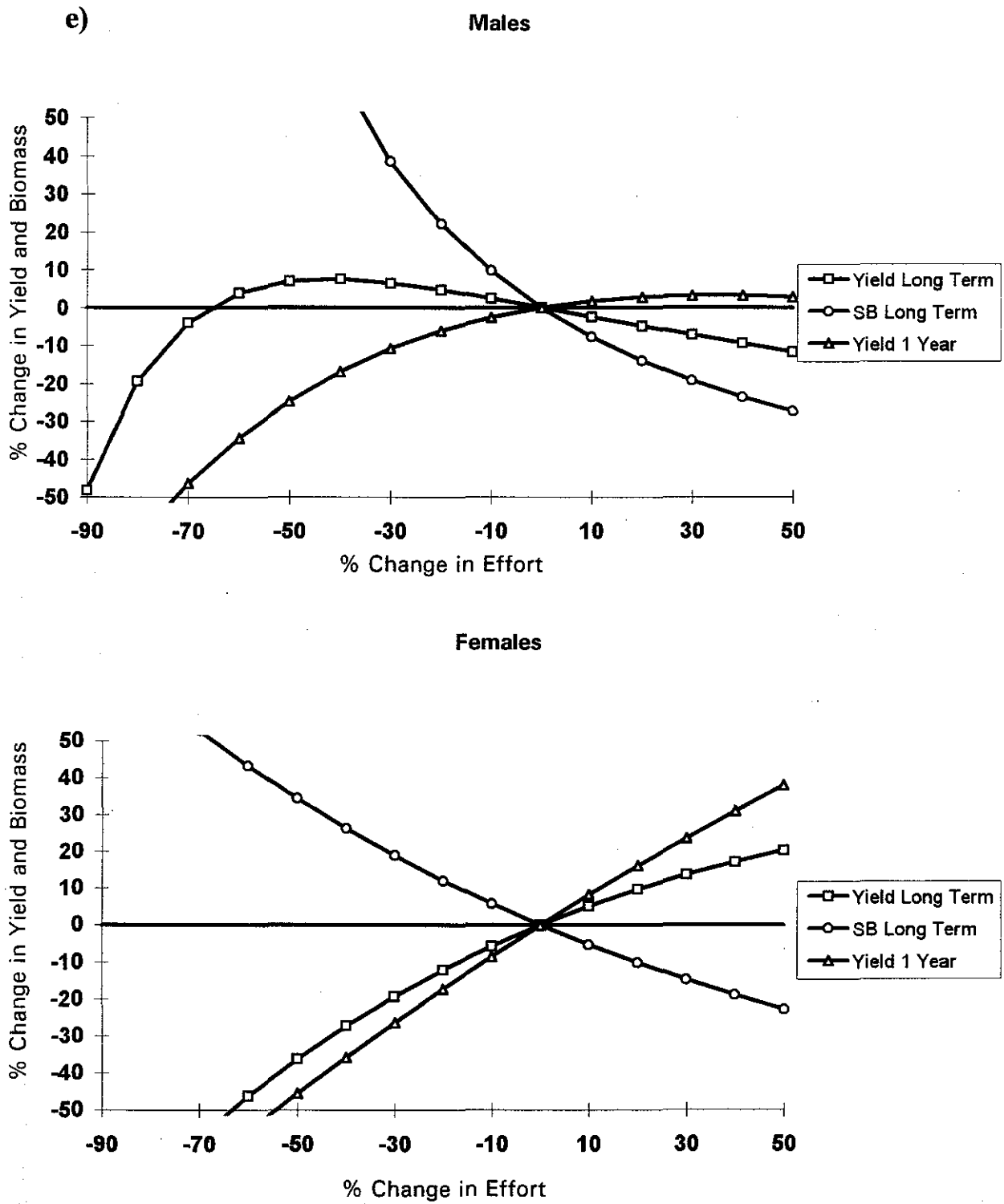
Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area.
(Details in Table 3.7.12 a.3)

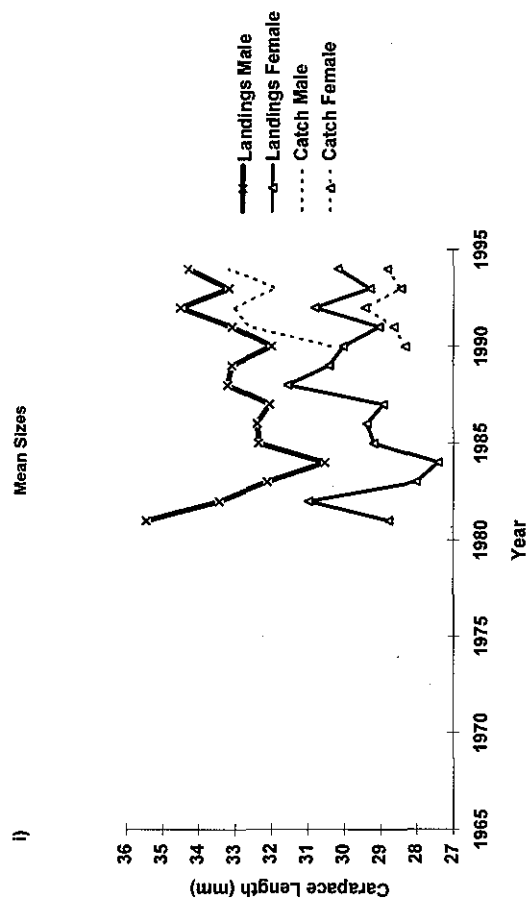
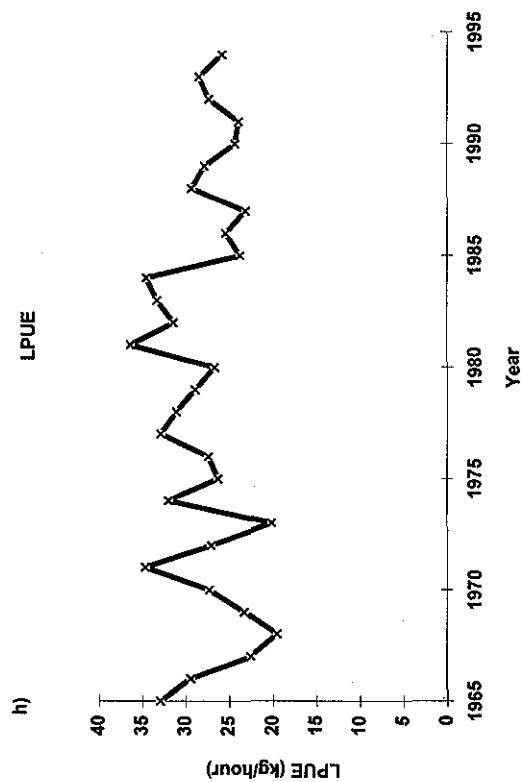
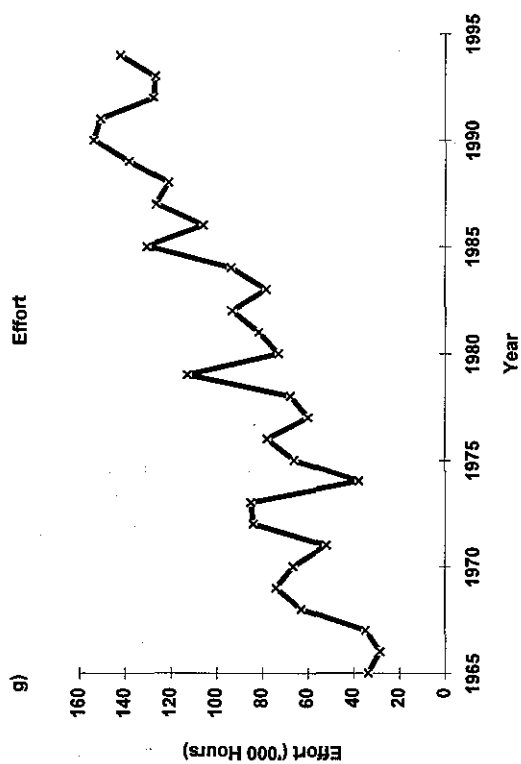
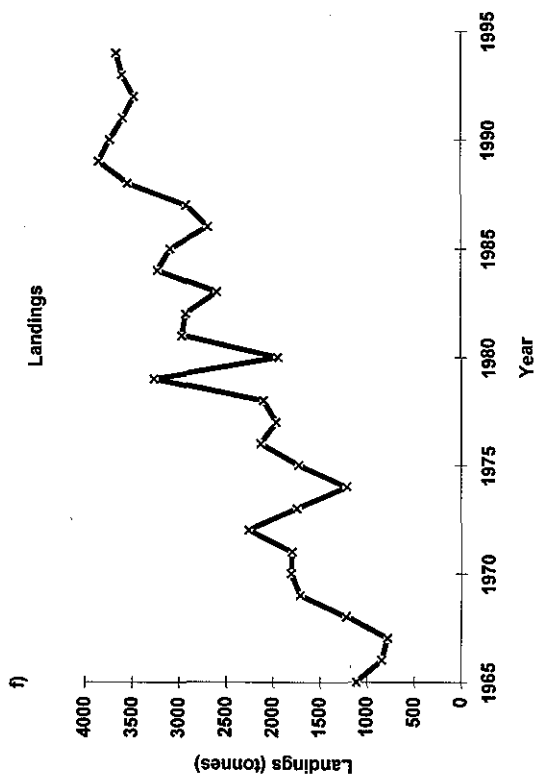




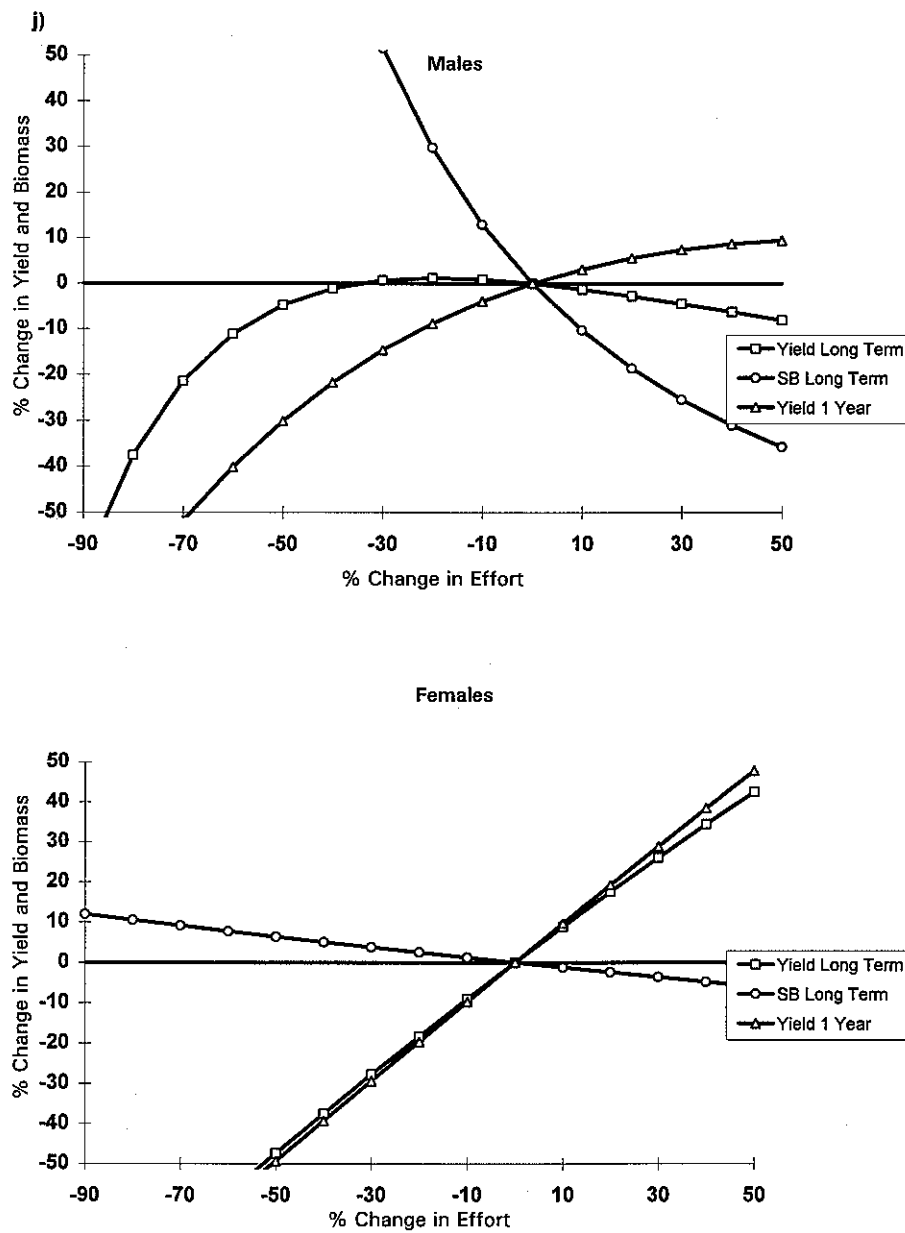
North Minch (FU11): Long-term trends in Scottish Nephrops trawler landings (tonnes), effort ('000 hours), LPUE (kg/hour) and mean size (mm CL) in catch and landings.



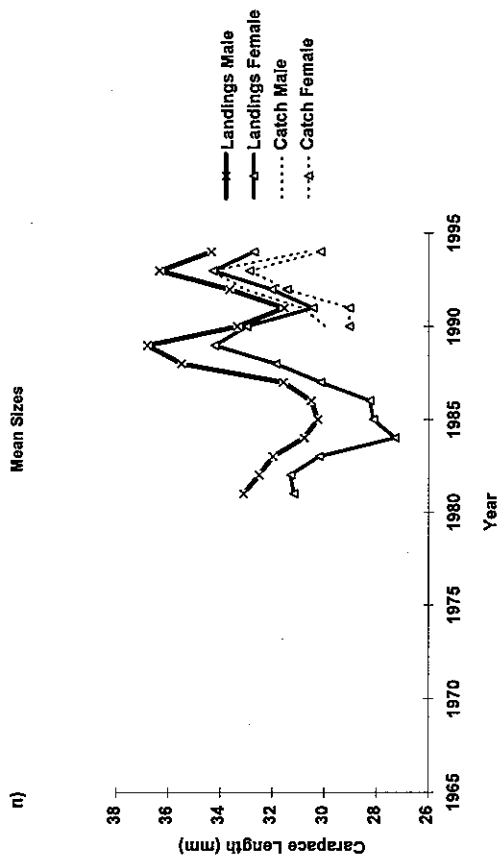
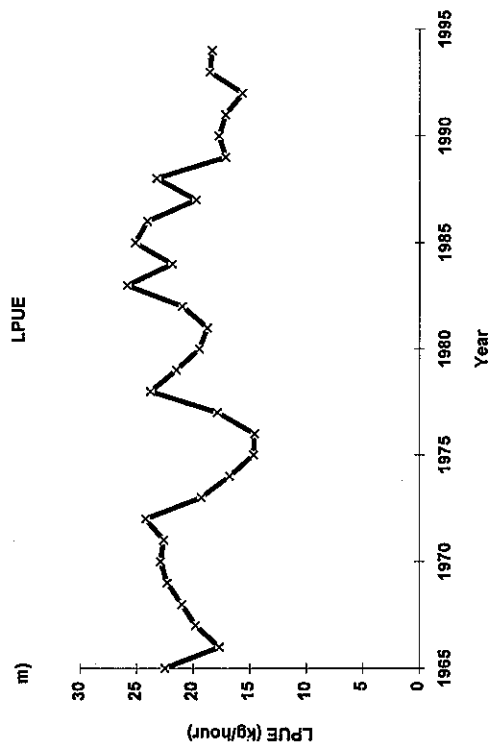
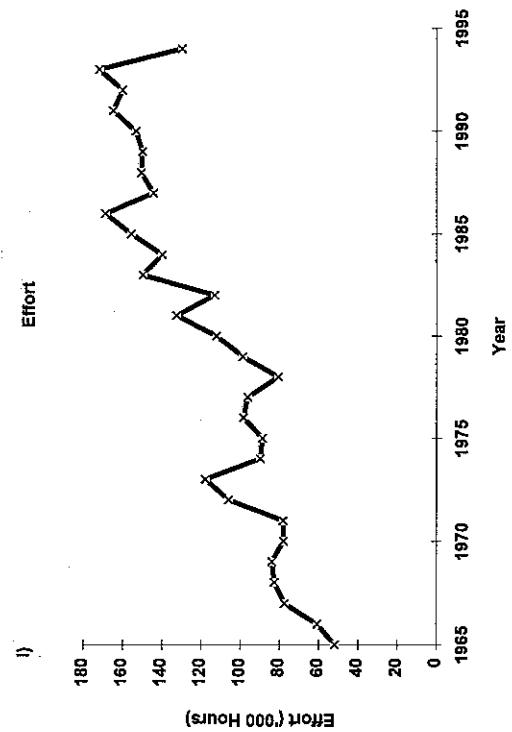
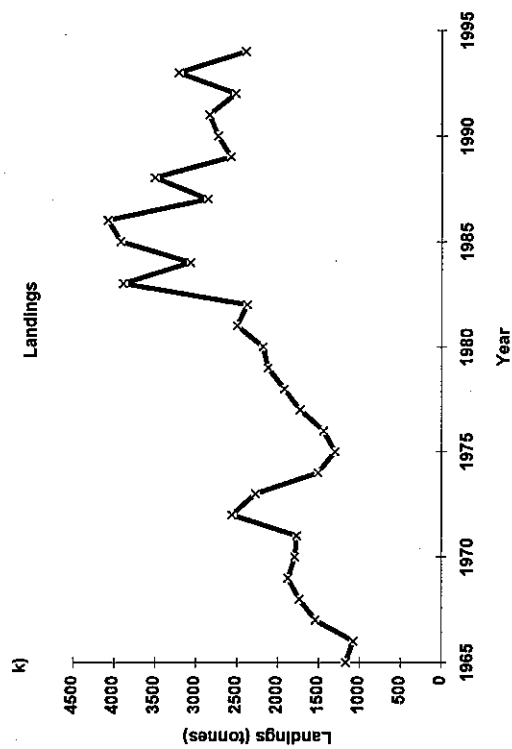
North Minch (FU 11): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Males and females shown separately.



South Mirch (F.U12): Long-term trends in Scottish Nephrops trawler landings (tonnes), effort ('000 hours), LPUE (kg/hour), and mean size (mm CL) in catch and landings.



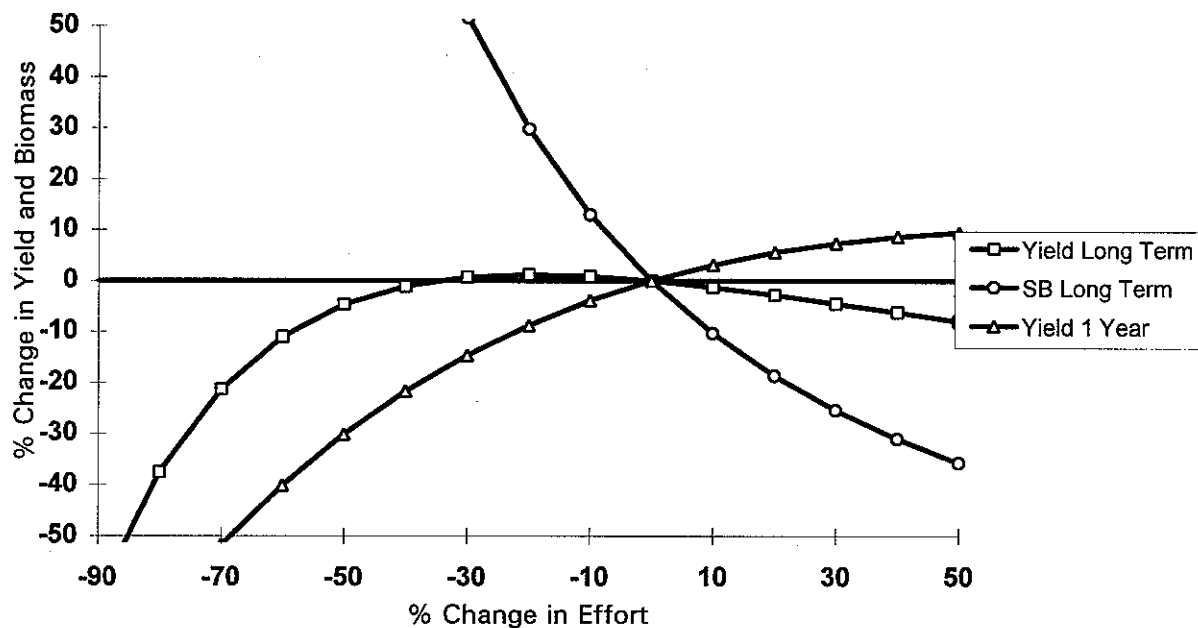
South Minch (FU12): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Males and females shown separately.



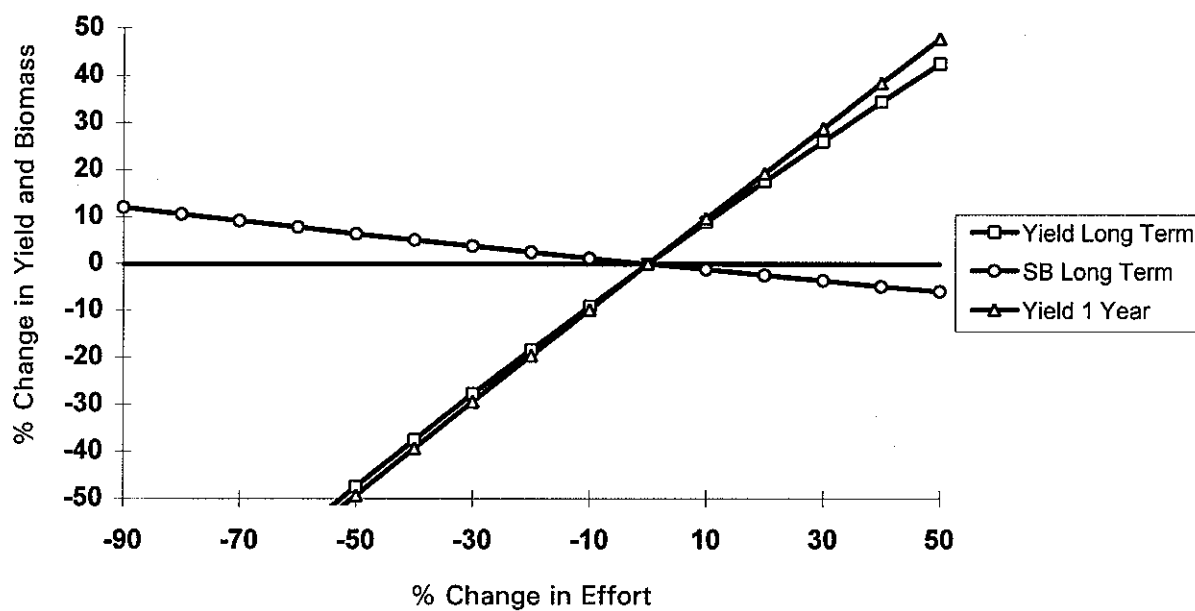
Firth of Clyde (FU13): Long-term trends in Scottish *Nephrops* trawler landings (tonnes), effort ('000 hours), LPUE (kg/hour) and mean size (mm CL) in catch and landings.

o)

Males



Females



Firth of Clyde (FU13): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Males and females shown separately.

3.7.12.b *Nephrops* in Divisions Vb (EU zone) and VIIb

Special comments: There are no reported landings of *Nephrops* from this area, so it is suggested that a zero TAC would prevent misreporting.

Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

3.8 Stocks in the Irish Sea (Division VIIa)

3.8.1 Overview

Fisheries

The roundfish fisheries in the Irish Sea are essentially conducted by vessels from the bordering countries (England and Wales, Ireland, Northern Ireland). The majority of vessels are otter-trawlers fishing for cod, whiting and plaice, with by-catches of anglerfish, hake and sole. The mesh size is 80 mm and 80 mm square mesh panels have been mandatory for UK otter-trawlers since 1993, and for Irish trawlers since 1994. Since the early 1980s, there has been a development of semi-pelagic trawling for cod and whiting in the spring and autumn, predominantly by vessels from Northern Ireland.

Although some of the otter-trawlers also take part in the fishery for sole, there has been a growing number of beam-trawlers, particularly from southern England and from Belgium, exploiting this stock. The most important by-catches of this fleet are plaice, rays, brill, turbot and anglerfish.

Over 250 boats take part in a targeted *Nephrops* fishery using 70 mm cod-end mesh and 75 mm square mesh panel. The larger vessels may use twin-rig trawls with 80 mm mesh. All boats take a considerable by-catch of whiting, much of which is discarded, and smaller quantities of cod, haddock, plaice and sole.

The other gears used to catch demersal species are gill-nets, notably by inshore boats targeting cod, bass, grey mullet, sole and plaice, and longlines, essentially by Spanish vessels fishing for hake.

The main pelagic fishery in the Irish Sea is for herring. In recent years, it has been predominantly operated by vessels from Northern Ireland.

State of stocks

Current fishing mortalities remain very high on cod and whiting in the Irish Sea. The spawning stock of cod was at the lowest recorded level in 1993 and is expected to remain well below average in the short term. A significant reduction in fishing mortality is required to restore the stock within safe biological limits. After increasing from its record low in 1990 due to average or strong recruitment in 1989-1991, the spawning stock of whiting has again decreased in 1994. The 1992 year classes of cod and whiting were the lowest recorded for these stocks.

The landings of plaice in 1993 and 1994 were the lowest recorded and the spawning stock has been below average in the last 5 years. All year classes recruited since 1987 were of below average strength. The spawning stock of sole has been temporarily boosted by strong 1984 and good 1989 year classes but is currently decreasing to record low levels. This stock is considered to be outside safe biological limits.

The stocks of *Nephrops* in the Irish Sea are considered to be fully exploited. There is some concern that fishing mortality may rise above the current high level if the use of twin rigs expands. Account should also be taken of the impact of this fishery on the stocks of protected species. There has been no assessment in recent years of the effects on *Nephrops* of predation by cod, but the low abundance of the latter has probably reduced its impact.

The state of the Irish Sea stock of herring is not known, but SSB probably increased due to a strong 1990 year class.

3.8.2 Cod in Division VIIa (Irish Sea)

Catch data (Table 3.8.2.1):

Year	Rec. TAC	Agreed TAC	Official landings	ACFM catch
1987	10.3	15.0	13.2	12.9
1988	10.1	15.0	15.8	14.2
1989	≤13.4	15.0	11.3 ¹	12.8
1990	15.3	15.3	9.9 ¹	7.4
1991	6.0	10.0	6.9 ¹	7.6 ²
1992	10.0	10.0	7.4 ¹	7.5 ²
1993	10.2	11.0	5.8 ¹	7.6 ²
1994	3.7	6.2	n/a	5.8 ²
1995	3.9	5.8		

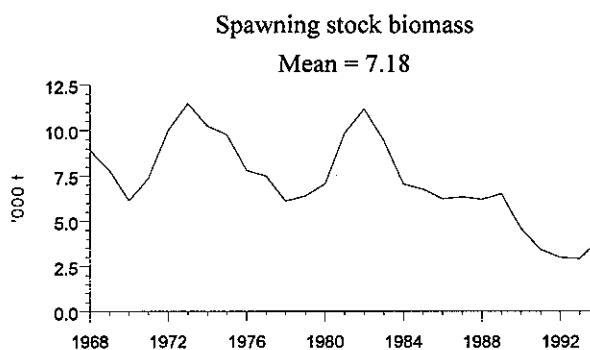
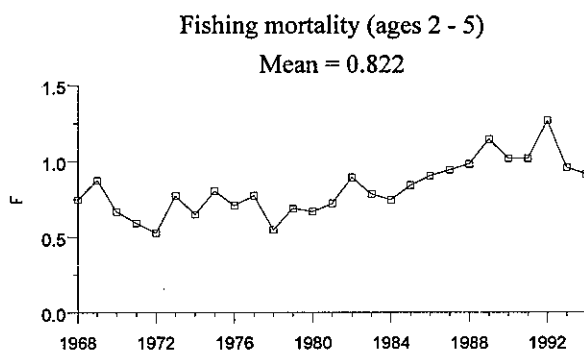
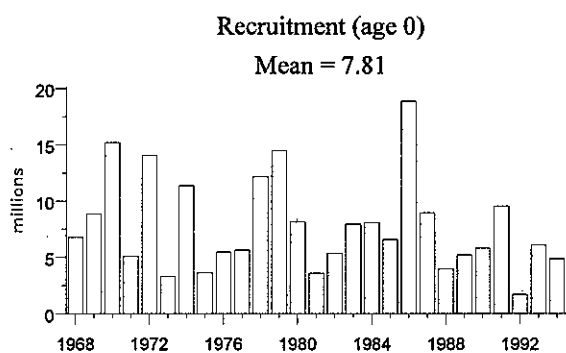
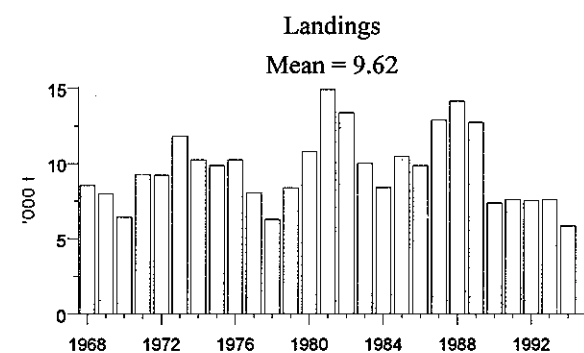
¹Preliminary. ²Including estimates of misreporting. Weights in '000 t.

Historical development of the fishery: The fishery has traditionally been carried out by pelagic and otter trawlers targeting spawning cod in spring and juvenile cod in autumn and winter. Activities of these vessels have decreased in recent years whilst a fishery for cod and hake using large pelagic trawls has increased substantially since the 1980s. The pelagic fishery is less seasonal than the otter trawl fishery. Cod are also taken as a by-catch in fisheries for *Nephrops*, plaice and sole.

State of stock: ACFM considers this stock to be outside safe biological limits.

The spawning stock biomass decreased to a historically low level in 1993. The SSB increased in 1994 due to recruitment of the above-average 1991 year class. All year classes since 1987, other than that of 1991, have been below average and the 1992 year class is the lowest recorded. Fishing mortality has slightly decreased in recent years but remains very high.

Details in Table 3.8.2.2.



Forecast for 1996

SSB(95) = 3.2, F(95) = .92, Basis: F(95)=F(94), Catch(95) = 6.4, Landings (95) = 6.4

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4 F ₉₄	0.37	4.9	3.5	3.5	8.7
B	0.6 F ₉₄	0.55	4.4	4.8	4.8	6.7
C	0.7 F ₉₄	0.64	4.2	5.4	5.4	5.8
D	0.8 F ₉₄	0.74	4.0	6.0	6.0	5.1
E	1.0 F ₉₄	0.92	3.6	7.0	7.0	3.9
F	1.2 F ₉₄	1.10	3.3	7.8	7.8	3.0

Weights in '000 t.

A,B : SSB is expected to increase to around the long-term mean.

C-E : SSB is expected to increase above the historical minimum.

F : SSB remains close to the historical minimum.

Management advice: ACFM recommends a significant reduction in fishing mortality in 1996 to restore the spawning biomass to levels experienced in the late 1980s when good recruitment was observed. To achieve this a 30% reduction in fishing mortality from the 1994 level is required in 1996.

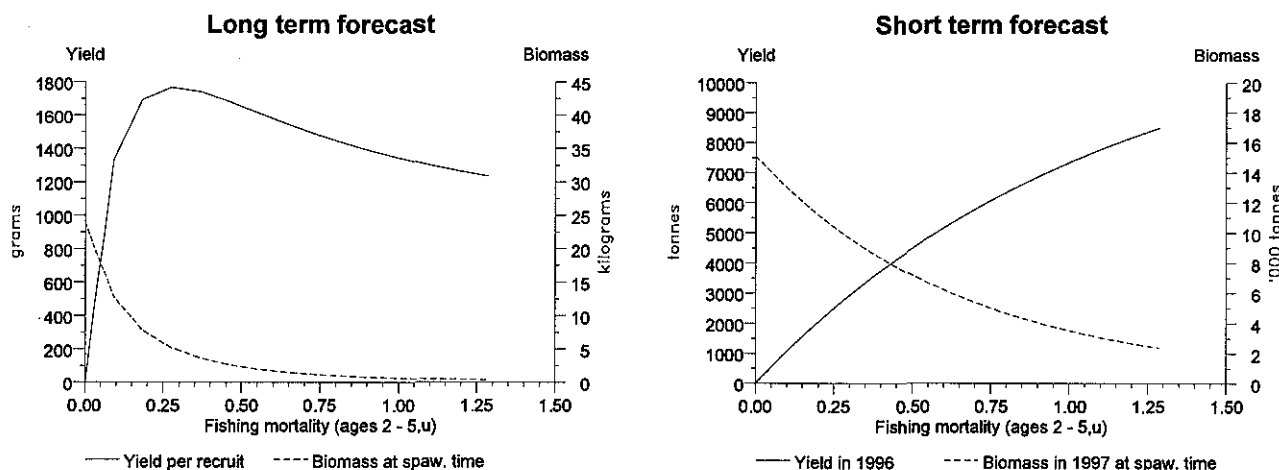
Special comments: The spawning biomass levels of the late 1980s are currently estimated to be about 6,000 t. A reduction of fishing mortality of 30% from the level in 1994 is required to restore SSB to this level in one year.

Following the reduction in TAC from 11,000 t in 1993 to 6,200 t in 1994, quotas have proved restrictive for some countries resulting in substantial misreporting. If the quality of data on catches and effort continues to deteriorate, ACFM may not be in a position to monitor the development of this stock, for which there is a high risk that SSB will fall below unprecedented low levels with the current intensity of exploitation. The remedial measures needed for this stock must be formulated to avoid this. Technical measures or catch controls are unlikely, on their own, to provide the reduction in fishing mortality necessary to increase the biomass to the level of the late 1980s.

Data and assessment: Analytical assessment based on landings-at-age, commercial CPUE and recruitment indices from surveys in Division VIIa. Estimates of misreported landings included from 1991 onwards.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.8.3 Haddock in Division VIIa (Irish Sea)

Catch data (Table 3.8.3.1):

Year	Agreed TAC ¹	Official landings	ACFM catch
1987		1287	
1988		747	
1989		n/a	
1990		n/a	
1991		n/a	
1992		n/a	
1993		n/a	689
1994		n/a	582 ²
1995	6.0		

¹Applies to Sub-areas VII, VIII, IX and X. ²Preliminary. Weights in tonnes.

Historical development of the fishery: The stock of haddock in the Irish Sea is considered to be a part of the haddock stock in Division VIa, and will in future be covered as part of that stock.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

3.8.4 Whiting in Division VIIa (Irish Sea)

Catch data (Table 3.8.4.1):

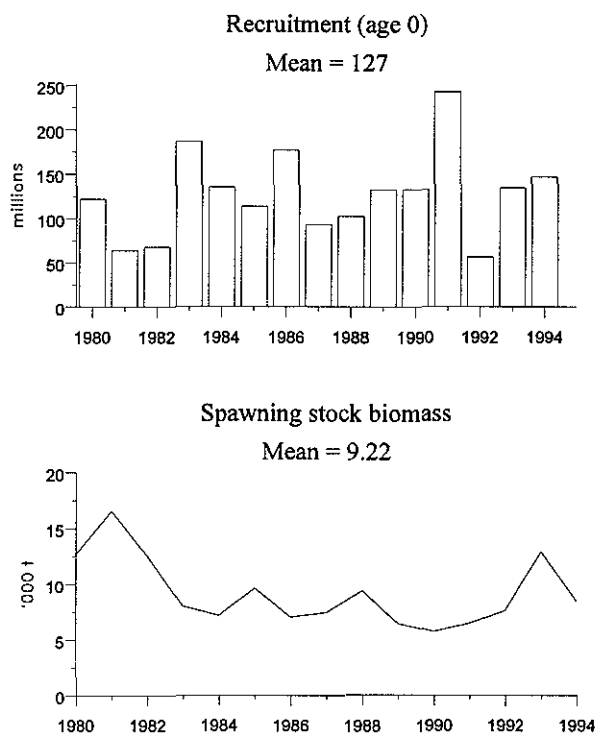
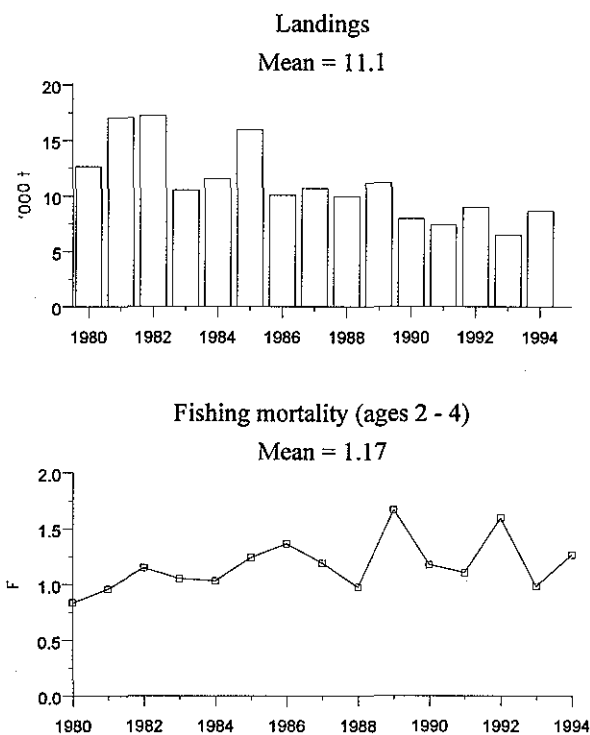
Year	Rec. TAC	Agreed TAC	Official Landings	Disc. ²	ACFM catch
1987	16.0	18.2	11.7	3.7	14.4
1988	12.0	18.2	11.5	1.9	11.9
1989	≤11.0	18.2	11.3	2.0	13.2
1990	8.3 ¹	15.0	8.2	2.7	10.7
1991	6.4 ¹	10.0	7.4	2.7	10.1 ³
1992	9.7 ¹	10.0	7.1	4.1	13.1 ³
1993	6.5	8.5	6.2	2.7	9.2 ³
1994	-	9.9	n/a	1.2	9.9 ³
1995	8.3	8.0			

¹Not including discards from the *Nephrops* fishery. ²From *Nephrops* fishery. ³Including estimates of misreporting. Weights in '000 t.

Historical development of the fishery: Whiting is taken mainly as a by-catch in mixed species otter trawl fisheries for *Nephrops*, cod and other demersal species, and in the pelagic fishery for cod. Fishing effort in the *Nephrops* and pelagic fisheries has increased steadily. Substantial discarding of juvenile whiting occurs, mainly in the *Nephrops* fisheries. Square mesh panels have been mandatory for all UK trawlers (excluding beam trawlers) in the Irish Sea since 1993 and for Irish trawlers since 1994.

State of stock: The stock may be within safe biological limits. The time series of data is short.

Details in Table 3.8.4.2.



Forecast for 1996:

SSB(95) = 10.2 , F(95) = 1.27 , Basis: F(95)=F(94),
Catch(95) = 11.6 , Landings (95) = 8.6

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs. (96)	SSB (97)
A	0.4 F ₉₄	0.51	13.6	8.0	5.0	16.4
B	0.6 F ₉₄	0.76	12.8	9.7	6.9	13.7
C	0.8 F ₉₄	1.02	12.0	11.2	8.5	11.5
D	1.0 F ₉₄	1.27	11.3	12.5	9.8	9.9
E	1.2 F ₉₄	1.52	10.7	13.6	11.0	8.6

Weights in '000 t.

A-C : SSB increases above 1995 level.

D : SSB decreases in 1997 but remains above average

E : SSB decreases in 1997 to below average

SSB is about the mean of this short-time series. There is no indication of low recruitment at the lowest levels of SSB recorded. There is concern about the high fishing mortality at which level the stock is very dependent on the maintainance of recruitment.

17% of the predicted 1996 landings and 55% of the predicted 1997 SSB depend on year classes assumed to be average.

Management advice: To prevent a decline in SSB ACFM recommends that fishing mortality in 1996 should not be allowed to increase above the 1994 level.

Data and assessment: Analytical assessment based on catch-at-age, commercial CPUE and indices from Surveys in Division VIIa. Estimates of discards in the *Nephrop* fisheries are included in the assessment, and estimates of misreported landings have been included since 1991.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess: 1).

3.8.5 Plaice in Division VIIa (Irish Sea)

Catch data (Table 3.8.5.1):

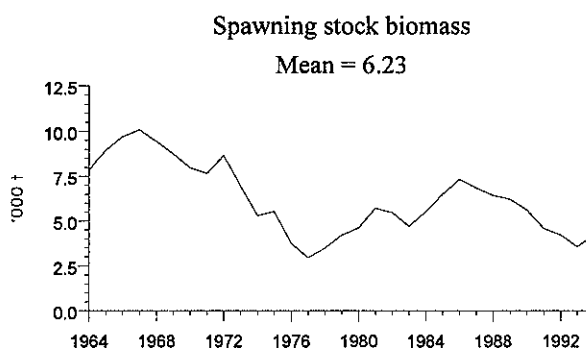
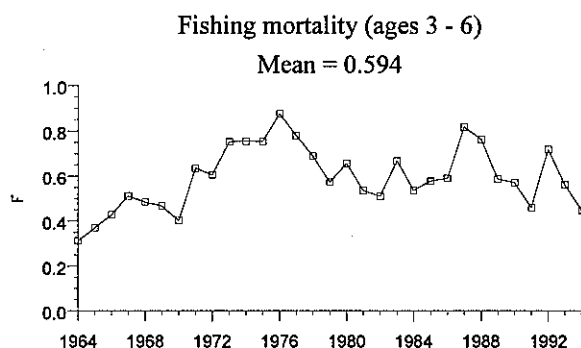
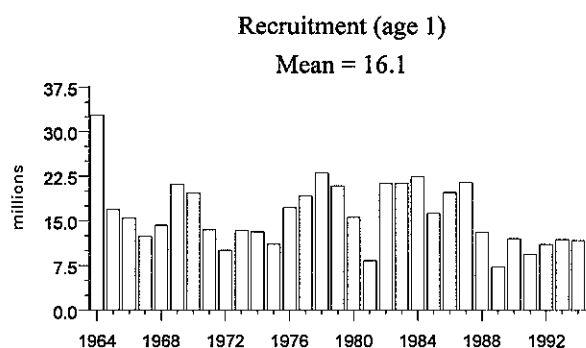
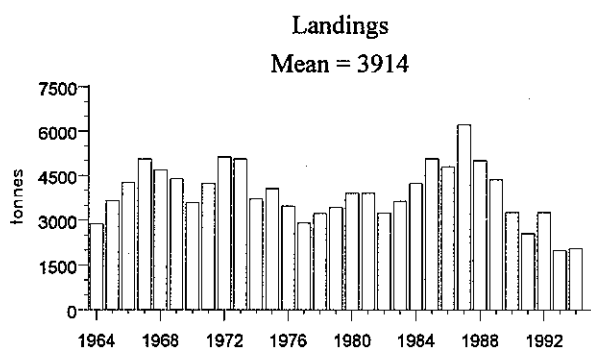
Year	Rec. TAC	Agreed TAC	Official landings	Discards	ACFM catch
1987	5.0	5.0	5.6	0.3	6.2
1988	4.8	5.0	4.4	0.2	5.0
1989	5.8	5.8	4.2	-	4.4
1990	5.1	5.1	4.0	-	3.3
1991	3.3	4.5	2.8	-	2.6
1992	3.0	3.8	3.2	-	3.3
1993	2.8	2.8	2.0	-	2.0
1994	<3.7	3.1	n/a	-	2.1
1995	2.4 ¹	2.8			

¹Catch at *status quo* F. Weights in '000 t.

Historical development of the fishery: Plaice are taken mainly in long-established UK and Irish otter trawl fisheries for demersal fish. They are also taken as a by-catch in the beam trawl fishery for sole. Effort in the UK and Belgian beam trawl fleets increased in the late 1980s, but declined in the early 1990s.

State of stock: ACFM considers the stock to be close to safe biological limits. SSB has been below average during 1990-94. Fishing mortality has decreased in recent years and is close to F_{med} (0.47). Recruitment since 1988 has been below the long-term average. There is no evidence that recruitment is reduced at the lowest observed SSB levels.

Details in Table 3.8.5.2.



Forecast for 1996:

SSB(95) = 4.6 , F(95) = 0.45 , Basis: F(95)=F(94),
Catch(95) = 2.4 , Landings (95) = 2.4

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs. (96)	SSB (97)
A	0.4 F ₉₄	0.18	5.2	1.1	1.1	6.8
B	0.6 F ₉₄	0.27	5.1	1.6	1.6	6.3
C	0.8 F ₉₄	0.36	5.1	2.1	2.1	5.9
D	1.0 F ₉₄	0.45	5.0	2.5	2.5	5.4
E	1.2 F ₉₄	0.54	5.0	2.9	2.9	5.1

Weights in '000 t.

A,B,C : SSB will increase through 1996 to around the long-term average level.

D,E : SSB will remain around 5,000 t.

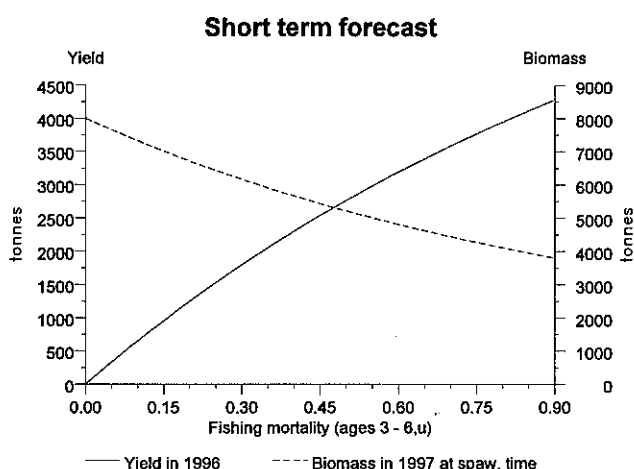
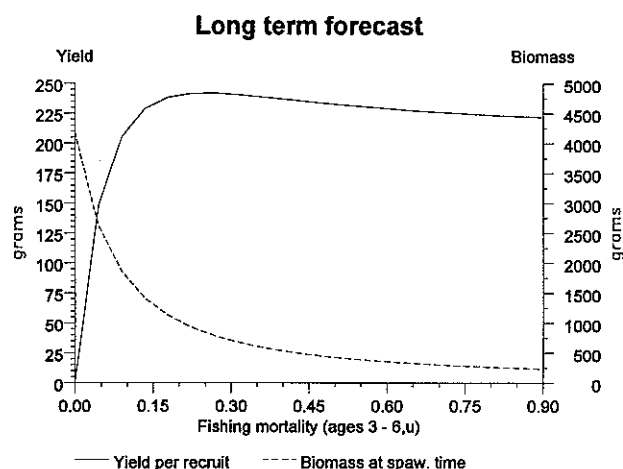
About 15% of the predicted 1996 landings and 30% of the predicted 1997 SSB depend on year classes assumed to be of average recruitment.

Management advice: No long-term gain in yield will be achieved by increasing fishing mortality above the 1994 level.

Data and assessment: Analytical assessment based on catch-at-age, commercial CPUE and survey CPUE data.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.8.6 Sole in Division VIIa (Irish Sea)

Catch data (Table 3.8.6.1):

Year	Rec. TAC	Agreed TAC	Official landings	ACFM catch ³
1987	1.9	2.1	2.0	2.8
1988	1.6	1.75	1.9	2.0
1989	<1.48	1.48	1.8	1.8
1990	1.5	1.5	1.6	1.6
1991	1.3	1.5	1.2	1.2
1992	- ¹	1.35	1.2	1.3
1993	0.92	1.0	1.0	1.0
1994	1.51 ²	1.5	n/a	1.4
1995	0.8	1.3		

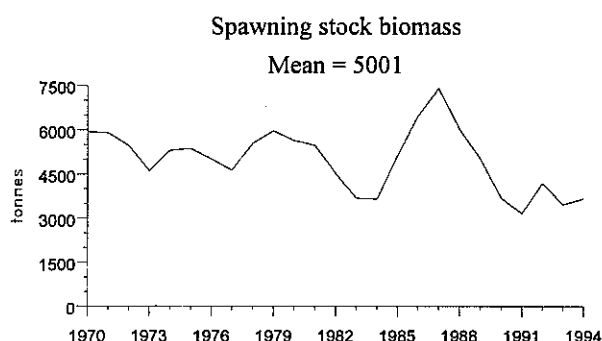
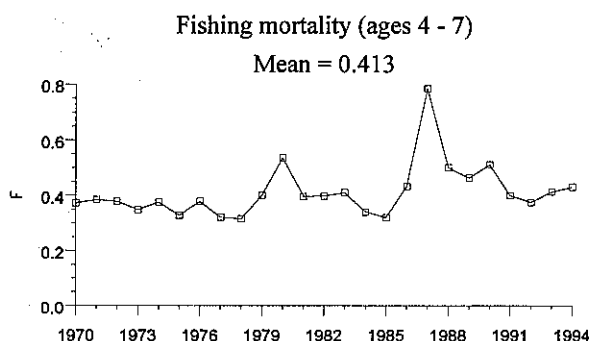
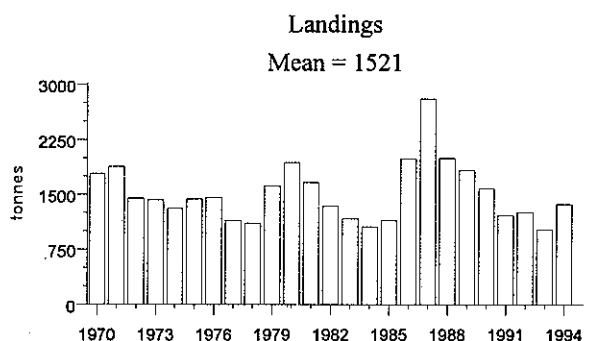
¹No long-term gains in yield by increasing F. ²Catch at *Status quo* F. ³Not including misreporting. Weights in '000 t.

Historical development of the fishery: Sole are taken mainly in a beam trawl fishery that commenced in the 1960s and are also taken as a by-catch in the longer established otter trawl fisheries. Effort in the Belgian beam trawl fleet increased in the late 1980s as vessels normally operating in

the North Sea were attracted into the Irish Sea by better fishing opportunities. Beam trawling by UK vessels increased substantially from 1986, reaching a peak in 1990 and decreased thereafter.

State of stock: The stock is considered to be outside safe biological limits. The SSB is close to or at the historical low level. Since the strong 1984 year class, all but one year class have been below average. Fishing mortality is well above F_{med} (0.23).

Details in Table 3.8.6.2.



Forecast for 1996:

SSB(95) = 3.0, F(95) = 0.43, Basis: F(95)=F(94),
Catch(95) = 1.1, Landings (95) = 1.1

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs. (96)	SSB (97)
A	0.4 F ₉₄	0.17	2.8	0.4	0.4	3.5
B	0.6 F ₉₄	0.26	2.8	0.6	0.6	3.3
C	0.8 F ₉₄	0.35	2.7	0.8	0.8	3.1
D	1.0 F ₉₄	0.43	2.7	1.0	1.0	2.9
E	1.2 F ₉₄	0.52	2.7	1.1	1.1	2.7

Weights in '000 t.

A,B : SSB will increase to above historical minimum.

C- E : SSB will be close to or decrease below the historical minimum level.

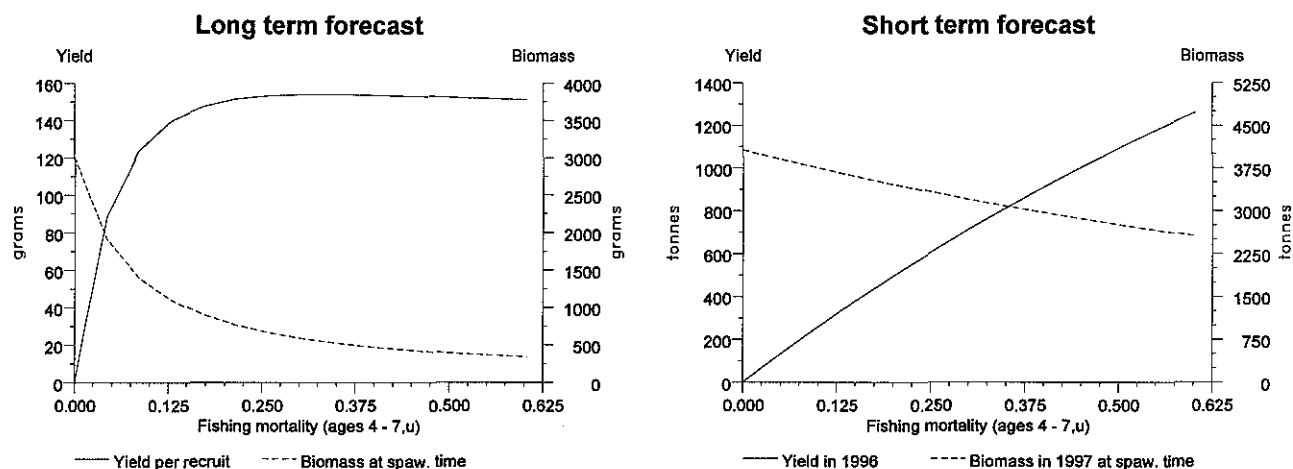
Management advice: To prevent a further decrease in SSB ACFM recommends for 1996 a 20% reduction in fishing mortality from the 1994 level, corresponding to a catch of 800 t in 1996.

Special comments: Last year's forecast was made on the assumption of average recruitment for 3 year classes which have subsequently been shown to be below average. Due to this, ACFM considered the stocks to be within safe biological limits. However, assuming an average 1994 year class, SSB is now expected to remain near the lowest recorded level. Forecasts with F levels at or above 80% of the 1994 level will lead to SSBs in 1997 which are lower than any previously recorded.

Data and assessment: Analytical assessment based on landings-at-age, commercial CPUE data and survey indices.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1995 (C.M.1996/Assess:1).

Yield and Spawning Stock Biomass



3.8.7 Irish Sea herring (Division VIIa)

Catch data (Table 3.8.7.1):

Year	Rec TAC	Agreed TAC	ACFM catch
1987	4.3	4.5	5.8
1988	10.5	10.5	10.2
1989	5.5	6.0	5.0
1990	5.7	7.0	6.3
1991	5.6	6.0	4.4
1992	6.6	7.0	5.3
1993	4.9-7.4	7.0	4.4
1994	~5.3	7.0	4.8
1995	~5.1	7.0	

Weights in '000 t

Historical development of the fishery: Catches in the early 1970s were generally above 20,000 t. Since 1984 catches have fluctuated between 4,400 and 12,200 t with recent catches (1989-1994) between 4,400 and 6,300 t. In recent years the majority of catches have been taken by the UK (Northern Ireland) fleet.

State of stock: The present state of the stock is not known. There is an indication that the spawning stock rose after 1993 with the strong 1990 year class entering the spawning stock.

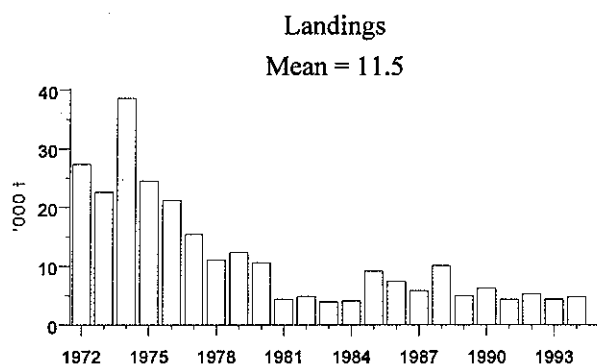
Forecast: No forecast is available.

Management advice: If a precautionary TAC is required, ACFM advises that it be set such that the catch does not exceed that of recent years (about 5,000 t).

Data and assessment: Biological sampling of catches is reasonable. The fishery-independent data available are not sufficient to form the basis for an analytical assessment.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess 13).

(Details in Table 3.8.7.2).



3.8.8 *Nephrops* in Division VIIa (excluding rectangles 33E2-E5)

Units included in recommended Management Area: a) Irish Sea East (Unit 14) and b) Irish Sea West (Unit 15).

Catch data (Table 3.8.8.1–3.8.8.2):

Year	Rec TAC	Agreed TAC ¹	ACFM landings
1987			9.9
1988			9.1
1989			8.5
1990			8.9
1991	8.76		10.4
1992	~8.90	20.0	8.0
1993	~9.40	20.0	8.7
1994	~9.40	20.0	7.8
1995	~9.40	20.0	

(Weights in '000 t) ¹Sub-area VII

Historical Development of the Fishery: Landings and effort in Irish Sea East increased to a peak in 1978 (graphs a, b). Since then landings have decreased more than effort. In Irish Sea West both landings and effort have increased since 1955; landings have been stable for the last 10 years (graph f).

State of stock: Both stocks are considered to be fully exploited.

In Irish Sea East: Effort fluctuating (graph b). Current F close to F_{max} in males and females (graph e).

In Irish Sea West F is high, but there is evidence of a slight fall in effort and a rise in CPUE in the most recent years (graphs g, h). Current F beyond F_{max} in both males and females (graph j). Recruitment relatively stable.

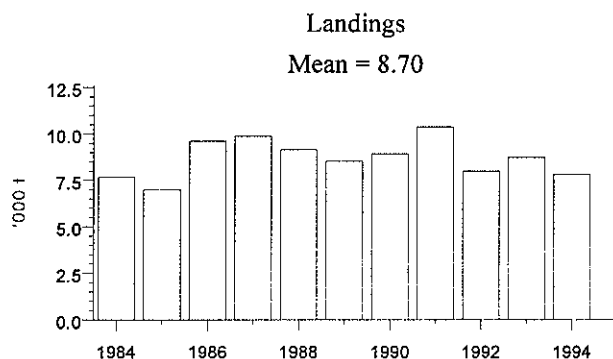
Management advice: ACFM advises a precautionary TAC of 9,400 t for 1996 and 1997.

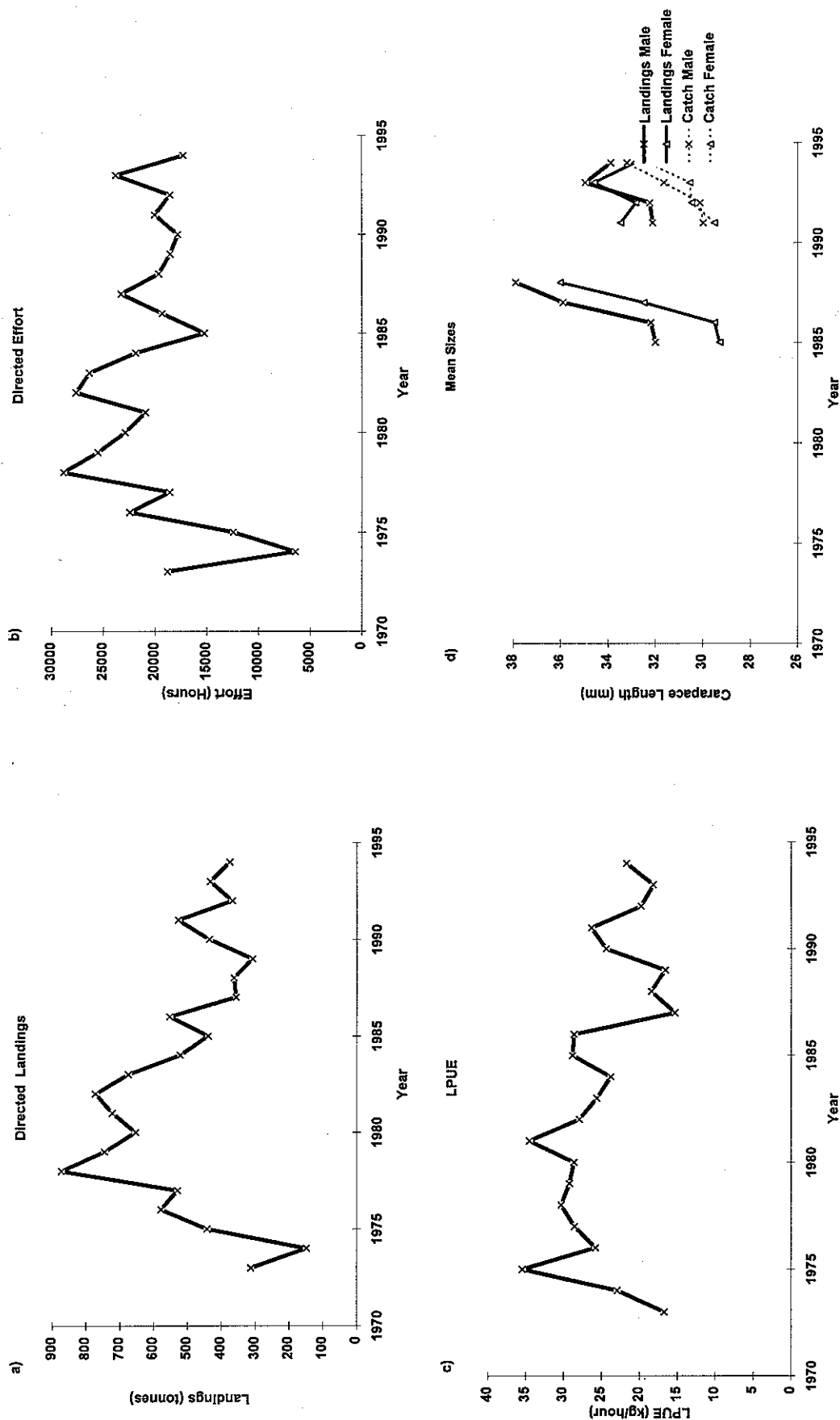
Special comments: ACFM advised a precautionary TAC of about 9,400 t for the Management Area in 1993–1995. There is no basis for revising this figure for 1996 and 1997. The high F values for the Irish Sea suggest that the situation should be very carefully monitored. While the Irish effort is probably declining there is an increasing use of more efficient twin rigs by the Northern Irish fleet, and this has not been separately recorded.

Data and assessment: LPUE and mean size data are available for both units (graphs c, d, h, i). CPUE available for Irish Sea West (graph h). Length-based assessment repeated for Irish Sea East and age-based assessment for Irish Sea West with revised Northern Ireland length compositions.

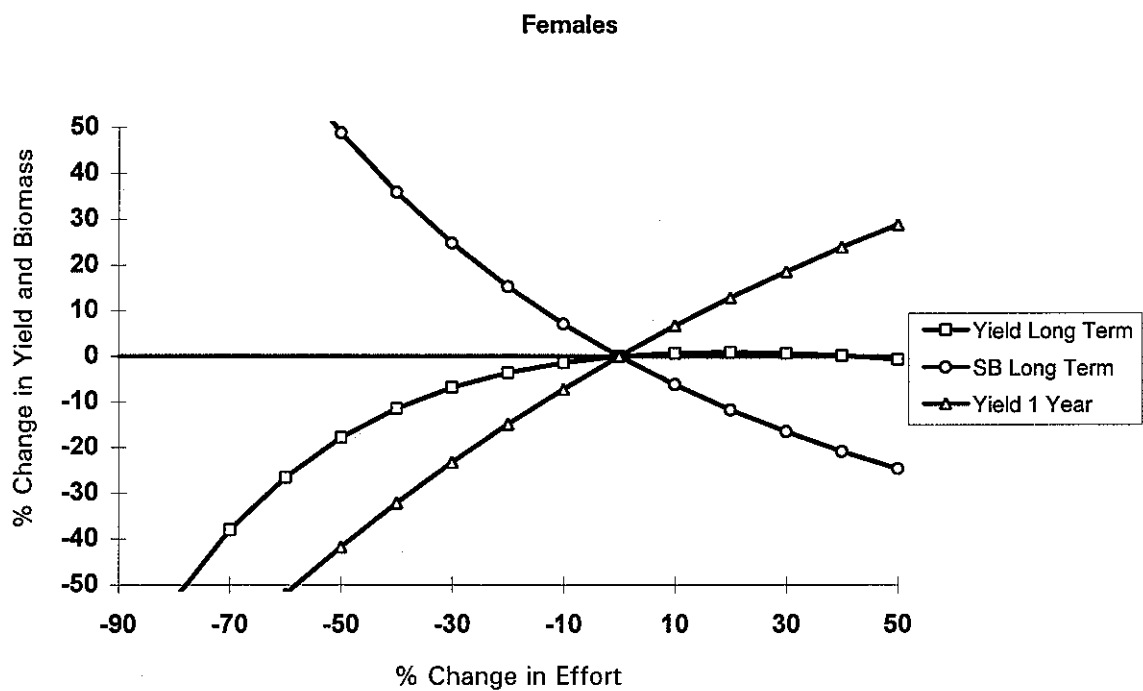
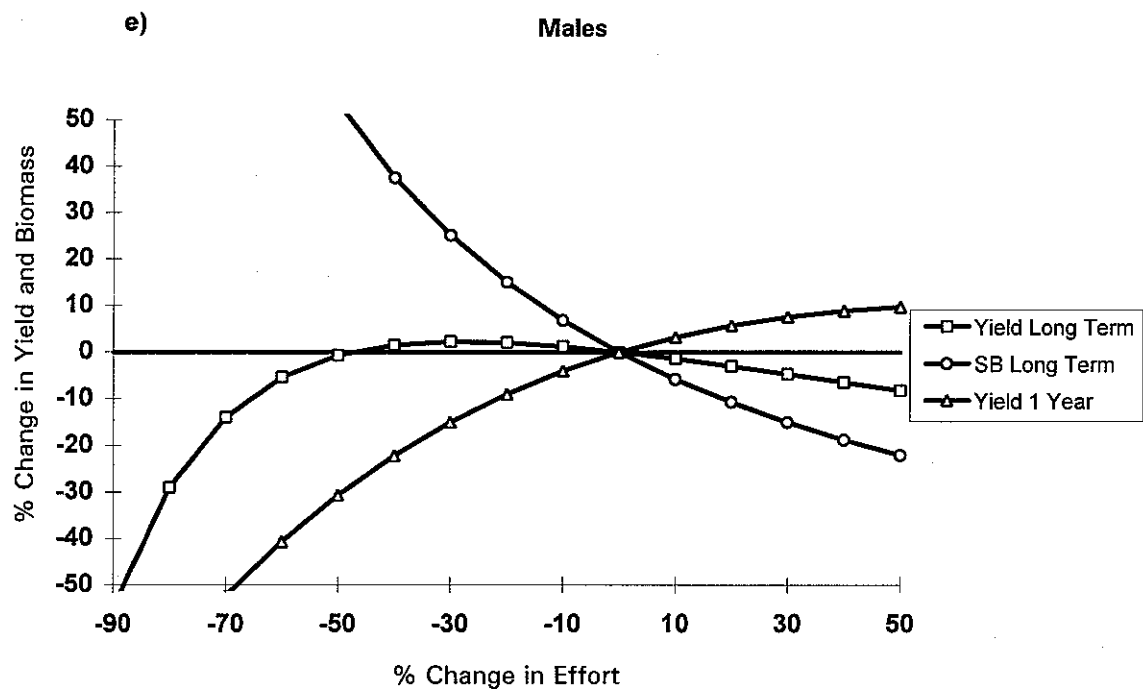
Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area
(Details in Table 3.8.8.3).

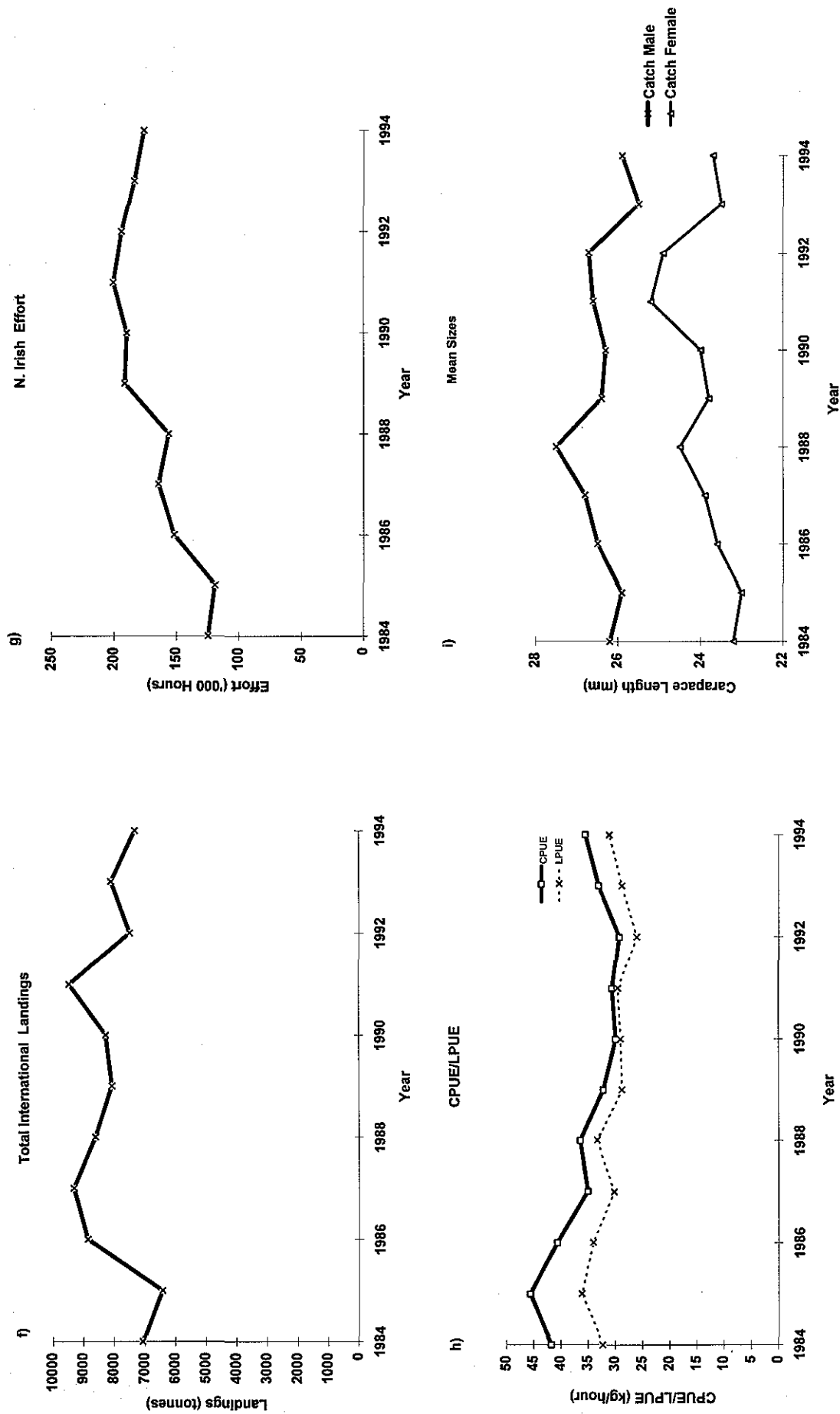




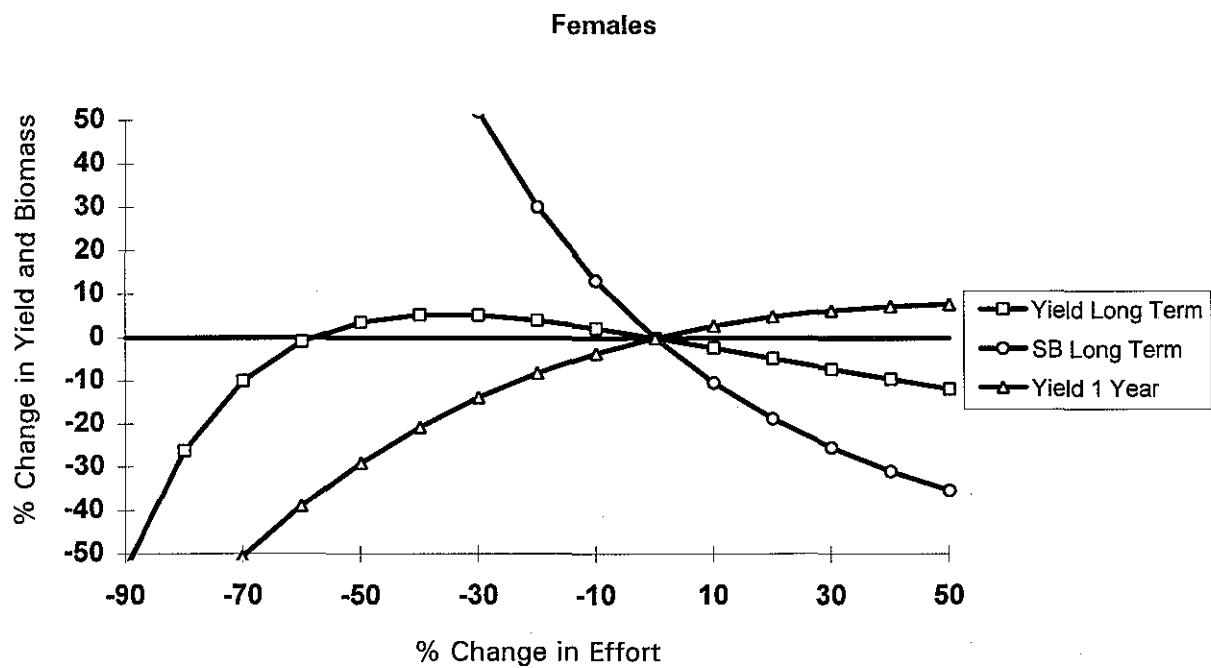
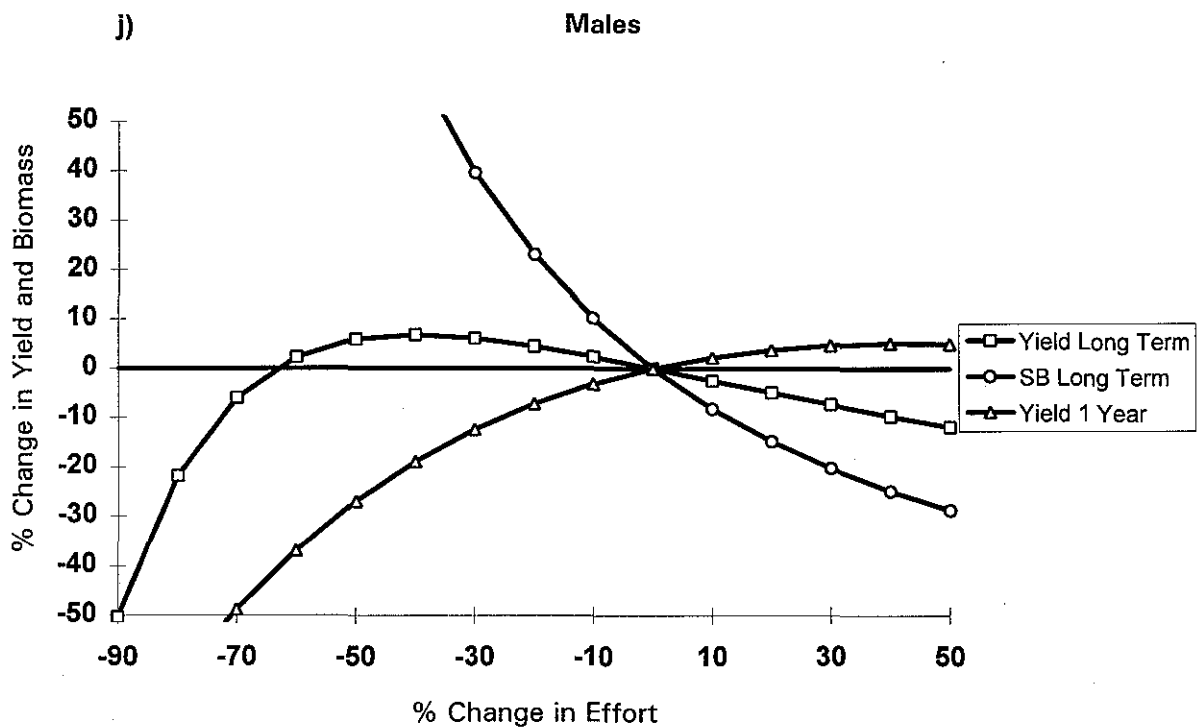
Irish Sea East (FU14): Long term trends in directed landings (tonnes), directed effort (hours), LPUE (kg/hour) and mean size (mm CL) in the landings and catch.



Irish Sea East (FU14): Percentage changes in long term landings and stock biomass, and short term landings following various changes in fishing effort. Males and females shown separately.



Irish Sea West (FU15): Long term trends in total international landings (tonnes) and N. Irish effort ('000 hours), CPUE and LPUE (kg/hour) and mean sizes (mm CL) in the catch.



Irish Sea West (FU15): Percentage changes in long term landings and stock biomass, and short term landings following various changes in fishing effort. Males and females shown separately.

3.9 Stocks in the Celtic Sea (Divisions VII-f-k), Western Channel (Division VII-e) and Northern parts of the Bay of Biscay (Divisions VIII-a,b,-d, and e)

3.9.1 Overview

Fleets and fisheries

Most of the demersal fisheries in this area have a mixed catch. Although it is possible to associate specific target species with particular fleets, various quantities of cod, whiting, hake, anglerfish, megrim, sole, plaice and *Nephrops* are taken together, depending on gear type.

In the Celtic Sea and Western Channel, fisheries for demersal species, mainly cod, whiting, sole and plaice, are conducted by Belgium, France, Ireland and the UK. The principal gears used are otter trawls and beam trawls. The targeting of sole and plaice using beam trawls became prevalent during the mid 1970s leading to an increase in the landings of these two species. The gradual replacement of otter trawls by beam trawls has occurred in the Belgian and UK fleets. In the Bay of Biscay there has been a substantial increase in the coastal gill-net fishery targeting sole.

A trawl fishery for anglerfish by Spanish and French vessels developed in the Celtic Sea and Bay of Biscay in the 1970s and expanded until 1990. The fishery has become dependent on small juvenile fish for which there is no minimum landing size. In addition, a gill net fishery has developed in the Celtic Sea in the last decade.

Nephrops are an important component of the fisheries in this area. These fisheries developed in the 1970s and 1980s and effort increased continuously until recent years. Landings increased initially as effort increased but these have tended to stabilise or decline at continuing high effort levels. The mesh size when fishing for *Nephrops* is lower than for other fish species and can lead to a significant by-catch of juvenile fish, notably hake.

There are separate trawl fisheries targeting herring in the Celtic Sea and mackerel and horse mackerel in the whole area. The herring fishery is principally a "roe" fishery and discard rates have at times reached very high levels. There is also a small directed fishery for sprat in the Channel.

Management measures

The assessment units used for demersal stocks in this area are small and catches deriving from them are generally in the region of 10 thousand t or less. However, the TACs set for the stocks often cover many management units. In addition, for a number of units, there are insufficient data for adequate assessments. This means that TACs which cover a number of depleted stocks comprise, at best, a

summation across units of analytical forecasts and average catches which offer no effective management control of the exploitation rate. Since a number of stocks affected by this problem are regarded as being close to or outside safe biological limits, there is a need to reconsider the areas on which TACs are set if management is to improve.

A notable feature of the demersal fisheries in this area is their mixed nature. The effectiveness of single species TACs is likely to be diminished unless this is taken into account. Use of measures to reduce fishing mortality directly, such as effort reductions in fleets, is likely to avoid a number of the disadvantages of catch controls in regulating the exploitation rate.

The fisheries in the Celtic Sea are essentially a continuation of the fisheries in the Bay of Biscay and some of the same fleets operate in both areas. However, the technical measures in the two areas differ. The minimum mesh sizes in the Celtic Sea are often different from those in the Bay of Biscay. This difference makes enforcement more difficult since vessels can carry multiple mesh sizes and may fish in the Celtic sea using the lower mesh sizes without being detected.

A significant problem has arisen with official landings data for certain French ports. The log-book data for these landings have not been fully processed for 1994 and as a result, it is not possible to determine the ICES reporting area from which the catches came. The problem is considered to be serious for the Celtic Sea cod and whiting assessments. This situation will deteriorate if data continue to be incompletely processed in the future.

State of the stocks

The majority of fish stocks which are assessed in this area are considered to be outside or close to being outside safe biological limits. They are characterised by declining spawning stock biomass and high fishing mortality rates. Of particular concern are sole and plaice in the Western Channel (Division VII-e) and cod in the Celtic sea. These stocks show evidence of poor recruitment at low levels of SSB and are therefore in danger of being recruitment overfished, a condition which may lead to stock collapse.

The Northern hake stock is discussed fully in Section 3.12.2. It is important to note that it is nevertheless taken by most of the demersal fleets in this area. This hake stock is regarded as being outside safe biological limits which means that any management of the fisheries in the area needs to consider its protection.

At present there are no major concerns about the *Nephrops* stocks in this area though most stock units are fully exploited in terms of yield per recruit. Management of these fisheries, however, needs to be sensitive to by-catches of stocks requiring protection such as Celtic Sea cod and Northern hake.

There is a serious decline in the Celtic Sea herring stock at the present high levels of fishing mortality. Spawning box closures have been in operation in this fishery for a number of years.

The mackerel caught in the area belong to the Southern and Western spawning components which at present are at historically low levels. The horse mackerel stocks in the area are considered to be within safe biological limits.

For many of the stocks in this area there are insufficient data for an assessment. It is not, therefore, possible to evaluate their status. It would be unwise to assume that these stocks are not already heavily exploited and conclude that catch controls can be relaxed.

3.9.2 Celtic Sea cod (Divisions VII_f, VII_g and VII_h)

Catch data (Table 3.9.2.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987	<6.4		8.2
1988	7.0		13.6
1989	8.6		16.7
1990	9.2		10.1
1991	4.5		6.9
1992	²		7.6
1993	6.5	17.5	9.0
1994	5.6	17.0	8.5
1995	4.7	17.0	

¹TAC covers Sub-areas VII (except Division VII_a) and VIII.

²Reduced fishing mortality. Weights in '000 t.

Historical development of the fishery: Celtic Sea cod are taken as a component of mixed trawl fisheries. Landings are made predominantly by French gadoid trawlers which in the 1970s devoted their activity in the Celtic Sea to fish mainly hake. The landings of cod by French *Nephrops* trawlers has increased in recent years.

State of stock: The stock is considered to be close to or outside safe biological limits. SSB fluctuates widely, depending on recruitment. After a temporary increase SSB in 1995 is below the long-term average. There is evidence of reduced recruitment at the present low level of SSB and recent year classes are below average. Good year classes are fished out rapidly due to high fishing mortality which is above F_{med} (0.8).

Further details in Table 3.9.2.2.

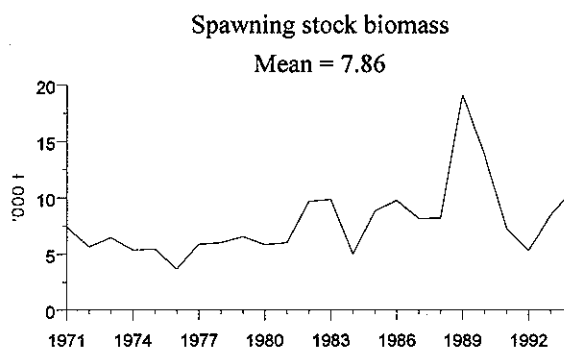
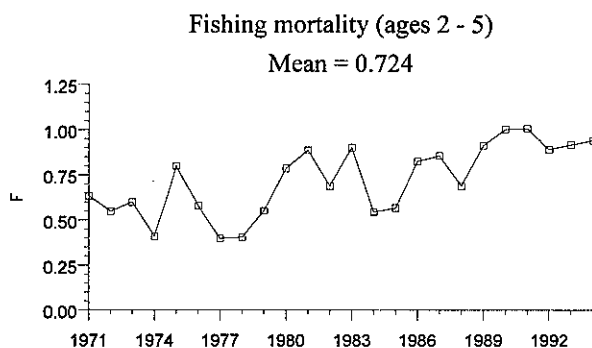
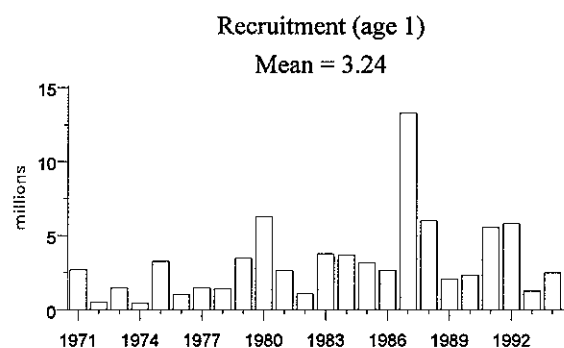
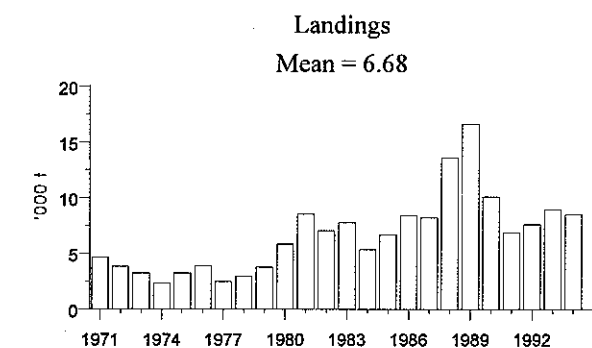
Forecast for 1996:

SSB(95) = 6.0, $F(95) = 0.94$, Basis: $F(95) = F(94)$, Catch(95) = , Landings (95) = 5.6.

Recruitment of the 1994 year class set equal to the geometric mean for the period 1970-1991.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4 F_{94}	0.38	5.6		2.8	8.8
B	0.6 F_{94}	0.56			3.9	7.3
C	0.8 F_{94}	0.75			4.7	6.0
D	1.0 F_{94}	0.94			5.5	5.0
E	1.2 F_{94}	1.13			6.1	4.2

Weights in '000 t.



The SSB is predicted to be close to the lowest recorded level by 1997 at *status quo* or higher F. For option C, SSB in 1997 remains above the average; with options D and E, SSB is decreasing below the average.

A combined forecast for cod and whiting is given in Section 3.9.3.

Management advice: In order to prevent a further decline in SSB, ACFM recommends a significant reduction of fishing mortality in 1996 by at least 20% of the fishing mortality in 1994.

Special comments: A catch limit would not be expected to constrain fishing mortality directly because the TAC for this stock includes all of Sub-area VII (except Division VIIa). Moreover, the forecast depends heavily on the strength of

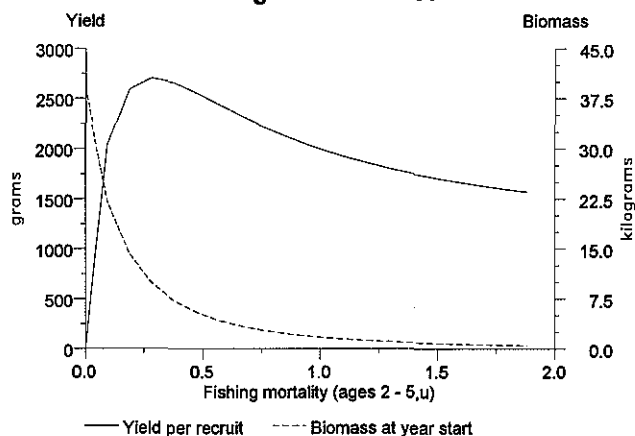
recruiting year classes which have not been measured and are assumed to be of average abundance. Therefore, a direct reduction in fishing effort is most likely to produce a reduction in fishing mortality.

Data and assessment: Analytical assessment based on landings and commercial CPUE data for eight quarterly fleets. Data for the French gadoid fleet, the main tuning fleet were missing for 1994. No recruitment indices are available for this stock.

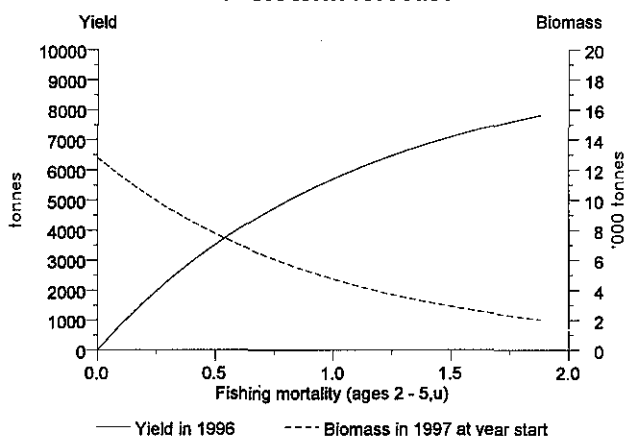
Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Yield and Spawning Stock Biomass

Long term forecast



Short term forecast



3.9.3 Celtic Sea whiting (Divisions VII_f, VII_g and VII_h)

Catch data (Table 3.9.3.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987	7.1		9.0
1988	7.0		10.4
1989	7.9		12.8
1990	8.4		10.6
1991	8.0		10.1
1992	8.0		9.1
1993	6.6	22.0	11.1
1994	<9.4	22.0	13.6
1995	8.2	25.0	

¹TAC covers Sub-area VII (except Division VII_a). Weights in '000 t.

Historical development of the fishery: Celtic Sea whiting is taken as a component of mixed fisheries. Landings are made predominantly by French gadoid trawlers. UK landings in the 1950s were 4-5 times their present level. Landings in 1994 are the largest since 1982.

State of stock: The stock is considered to be within safe biological limits. SSB fluctuates depending on recruitment. The 1990-1992 year classes are above average. Fishing mortality, though declining, is high.

Further details in Table 3.9.3.2.

Forecast for 1996:

SSB(95) = 22.5, F(95) = 0.92, Basis: F(95) = F(94), Catch(95) =, Landings (95) = 13.5.

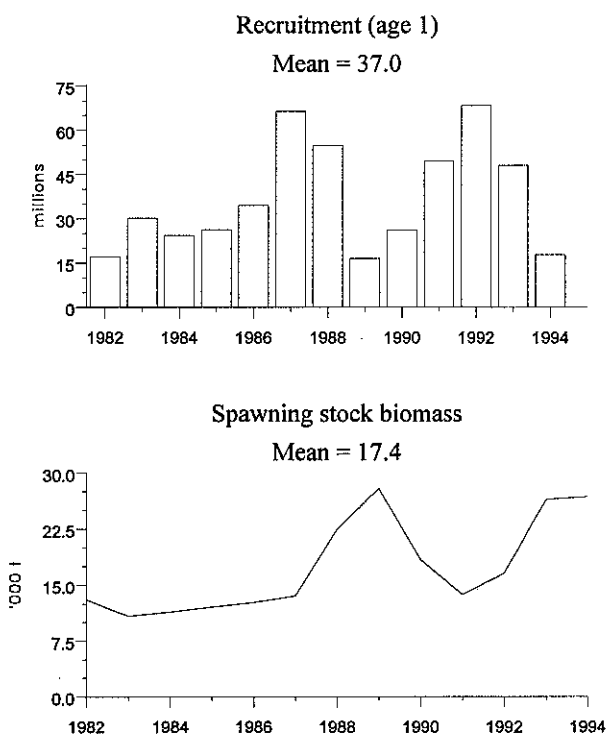
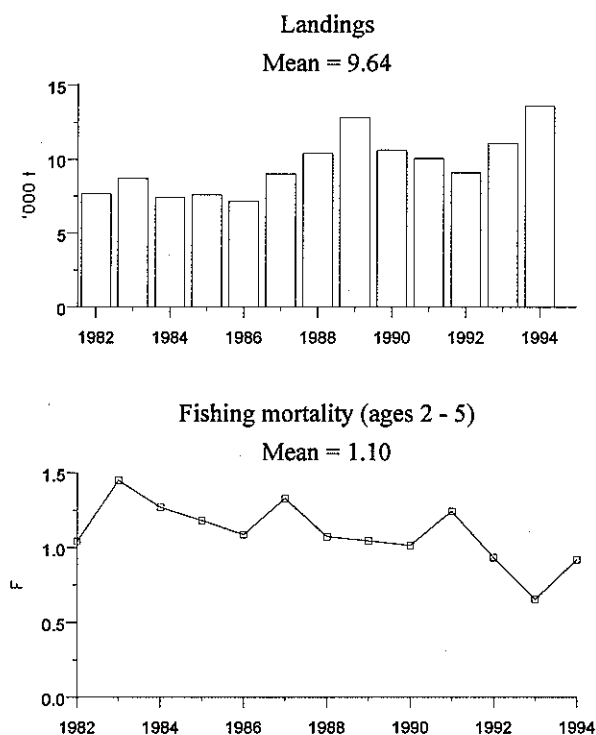
Recruitment of the 1994 and 1995 year classes set equal to the geometric mean for the period 1982-1992.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4F ₉₄	0.37	18.0		5.0	23.1
B	0.6F ₉₄	0.55			7.0	20.9
C	0.8F ₉₄	0.74			8.6	19.0
D	1.0F ₉₄	0.92			10.0	17.4
E	1.2F ₉₄	1.11			11.2	16.0

Weights in '000 t.

With options A,B,C,D: SSB in 1997 is decreasing but remains above the average. With option E: SSB is decreasing to average. With option F: SSB is decreasing below average. For all options, SSB in 1997 remains below the high 1989 or 1993-1994 level.

Management advice: Whiting are taken in a mixed fishery with cod. In order to protect cod, **ACFM recommends a significant reduction in fishing mortality in 1996 by at least 20% of the fishing mortality in 1994.** A combined forecast for cod and whiting is given in the figure below.

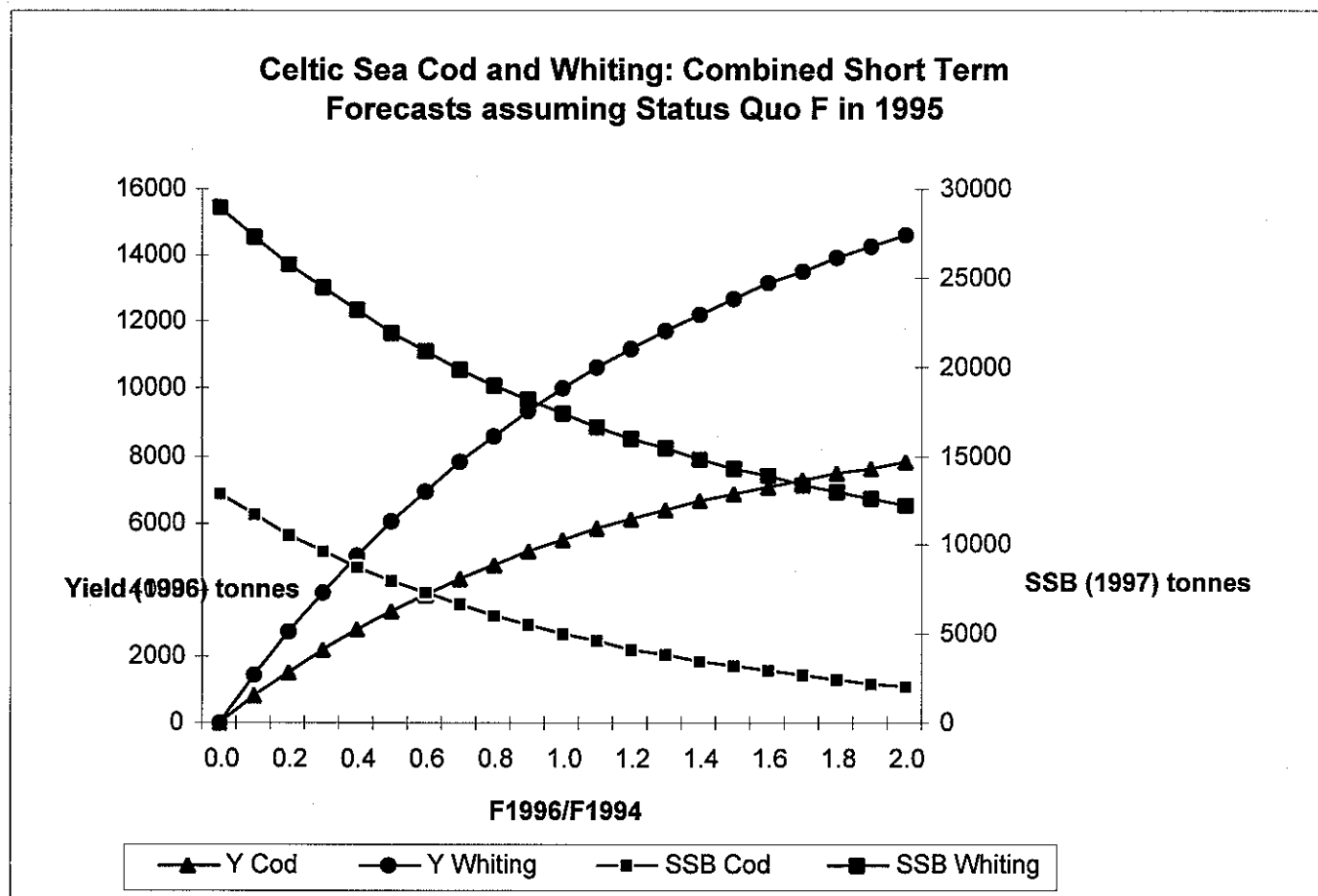


Special comments: The forecast is not of high precision. Much of this is due to dependence of the forecast on recruiting year classes whose abundance cannot be precisely determined.

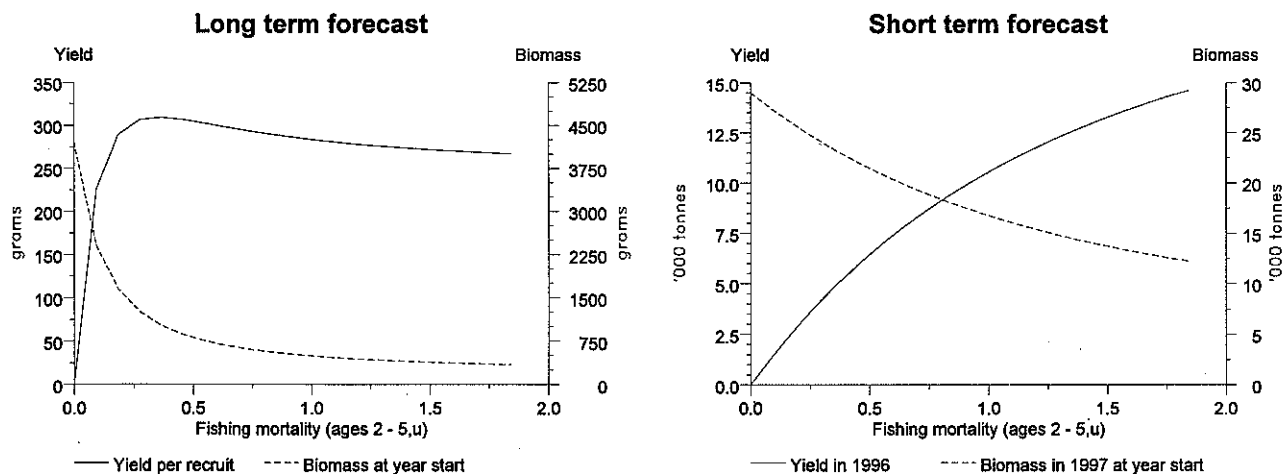
Data and assessment: Analytical assessment based on landings and commercial CPUE data, but 1994 data for the

French gadoid fleet, the main tuning fleet, were missing. No recruitment indices are available for this stock. Non-reporting of French catches by Division has led to a need to estimate 43% of the total landings used for the assessment.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).



Yield and Spawning Stock Biomass



3.9.4 Celtic Sea plaice (Divisions VII^f and g)

Catch data (Table 3.9.4.1):

Year	Rec. TAC	Agreed TAC	Official landing	ACFM catch
1987	-	1.8	1.9	1.9
1988	-	2.5	2.1	2.1
1989	-	2.5	2.2	2.2
1990	~1.9	1.9	2.1	2.1
1991	~1.7	1.9	1.5	1.5
1992	¹	1.5	1.2	1.2
1993	¹	1.4	1.1	1.1
1994	¹	1.4	1.1	1.1
1995	1.29	1.4		

¹No long-term gain in yield by increasing F. Weights in '000 t.

Historical development of the fishery: In the 1970s the fishery was mainly carried out by Belgian beam trawlers and Belgian and UK otter trawlers. In recent years the otter trawlers were almost entirely replaced by beam trawlers, which have sole as their target species. Both countries together have always taken approximately 85% of the catches.

State of stock: The stock is considered to be close to safe biological limits. SSB rose to a peak in the late 1980s but has since declined rapidly. Fishing mortality increased steadily during the 1980s, and is currently close to the highest observed level. Recruitment since 1989 has been poor. Further details in Table 3.9.4.2.

Forecast for 1996:

$F_{status\ quo}$ = mean F over 1992-1994

SSB(95) = 1.08, $F(95)$ = 0.67, Basis: $F(95) = F(sq)$, Catch(95) = Landings (95) = 0.96.

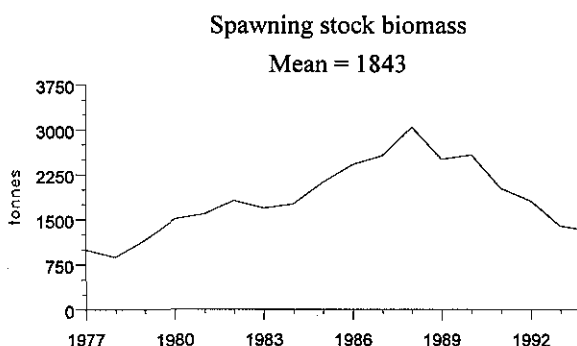
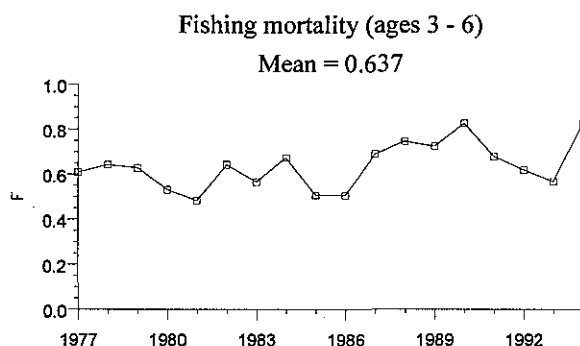
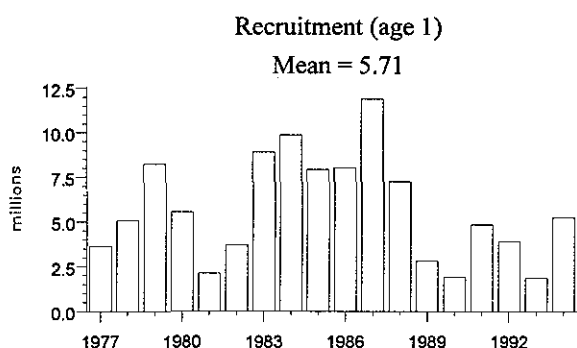
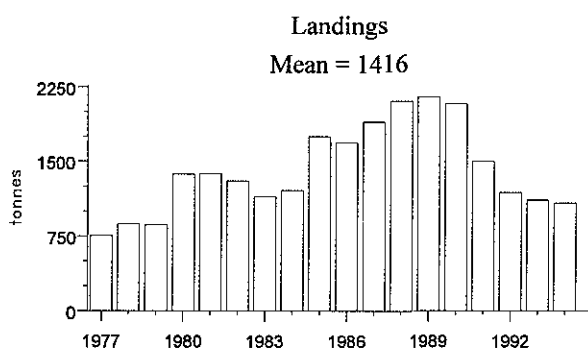
Recruitment of the 1993, 1994 and 1995 year classes was set equal to the geometric mean for the period 1977-1992.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	$0.4F_{sq}$	.27	1.23	.51	.51	1.77
B	$0.6F_{sq}$	.40	1.20	.73	.73	1.60
C	$0.8F_{sq}$	.54	1.17	.93	.93	1.45
D	$1.0F_{sq}$	.67	1.15	1.10	1.10	1.32
E	$1.2F_{sq}$	.81	1.12	1.26	1.26	1.20

Weights in '000 t.

For options A-E, SSB increases in 1997 compared with 1995 but remains below the long-term average.

Management advice: To prevent further reductions in SSB for this stock and in the Celtic sea sole, ACFM recommends that fishing mortality in 1996 should be reduced by 20% from the *status quo* level corresponding to a catch of 930t. Management of this stock should be viewed in conjunction with Celtic Sea sole.

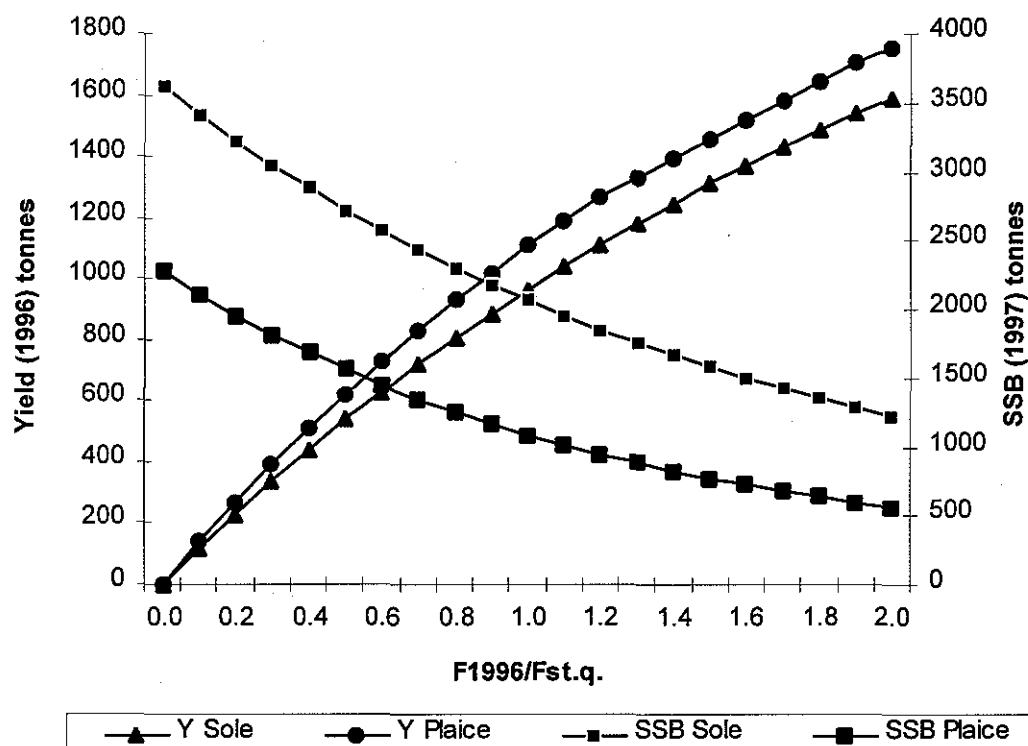


Special comments: Plaice and sole in the Celtic Sea are taken in the same fishery. If departure from *status quo* fishing mortality is implemented for either species, the implications for the associated species should be considered. A combined forecast is given below. Forecasts depend on recruiting year classes whose abundance cannot be precisely determined.

Data and assessment: Analytical age-based assessment based on revised landings, survey and commercial CPUE data.

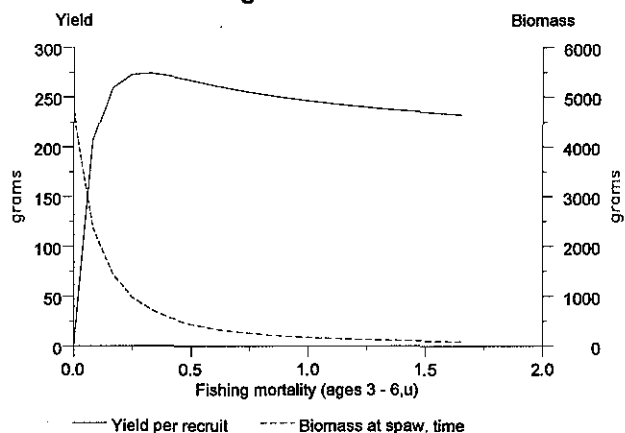
Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1994 (C.M.1995/Assess:6).

Celtic Sea Sole and Plaice: Combined Short Term Forecasts assuming Status Quo F in 1995

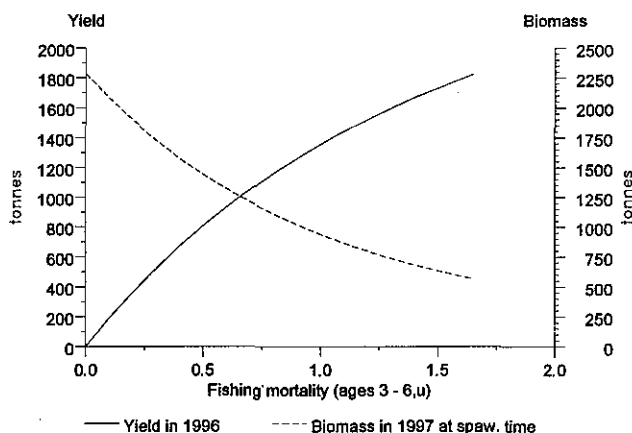


Yield and Spawning Stock Biomass

Long term forecast



Short term forecast



3.9.5 Celtic Sea sole (Divisions VIII f and g)

Catch data (Table 3.9.5.1):

Year	Rec. TAC	Agreed TAC	ACFM catch
1987	-	1.6	1.2
1988	0.9	1.1	1.1
1989	1.0	1.0	1.0
1990	1.2	1.2	1.2
1991	1.1	1.2	1.1
1992	1.1	1.2	1.0
1993	¹	1.1	0.9
1994	¹	1.1	1.0
1995	1.0	1.1	

¹No long-term gains in yield by increasing F. Weights in '000 t.

Historical development of the fishery: In the 1970s the fishery was mainly carried out by Belgian beam trawlers and Belgian and UK otter trawlers. In recent years the Belgian otter trawlers were almost entirely replaced by beam trawlers. Both countries together have always taken approximately 85% of the catches.

State of stock: The stock is considered to be close to safe biological limits. Fishing mortality increased since the late 1970s to a peak value in 1990; it has since decreased, but remains above $F_{high}(0.45)$. SSB has steadily declined since the early 1970s, reaching a record low value in 1991 and has remained close to that level through 1994. The 1989 year class was confirmed to be strong. There is no evidence of decreased recruitment at the lowest recorded SSB levels.

(Further details in Table 3.9.5.2)

Forecast for 1996:

SSB(95) = 2.3, $F(95) = 0.50$, Basis: $F(95) = F(94)$, Catch(95) = - , Landings (95) = 1.0.

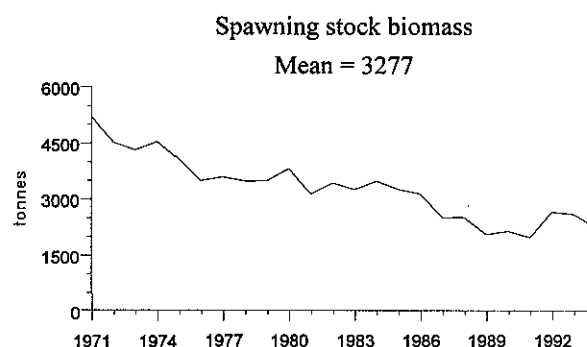
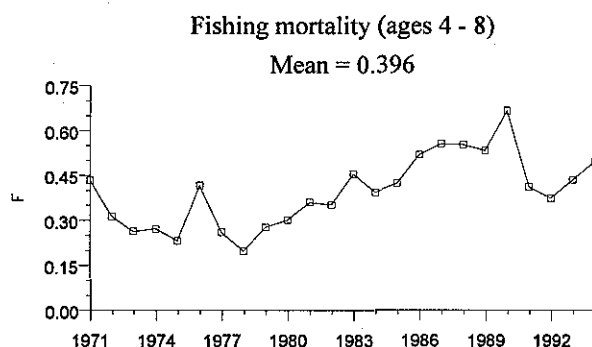
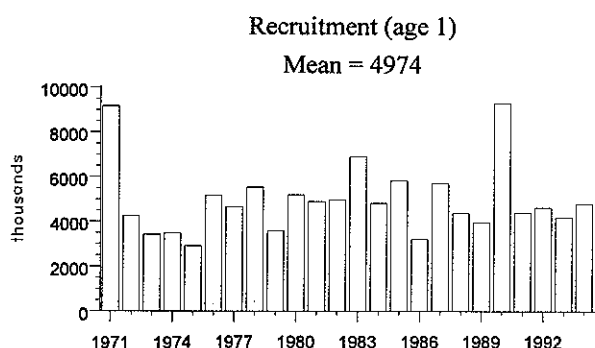
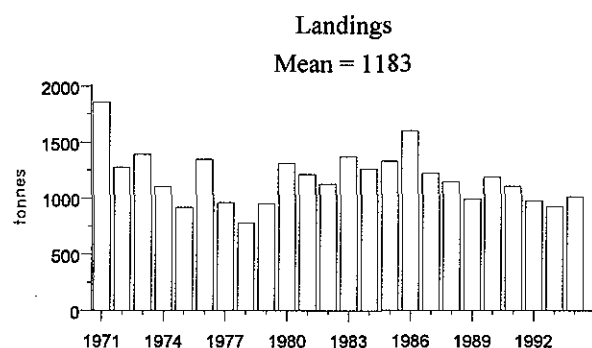
Option	Basis	F (96)	SSB (96)	Catch (96)	Landgs (96)	SSB (97)
A	$0.4F_{94}$	0.20	2.4	-	0.4	2.9
B	$0.6F_{94}$	0.30	2.3	-	0.6	2.6
C	$0.8F_{94}$	0.40	2.2	-	0.8	2.3
D	$1.0F_{94}$	0.50	2.2	-	1.0	2.1
E	$1.2F_{94}$	0.60	2.1	-	1.1	1.9

Weights in '000 t.

Options A, B and C, SSB increases in 1997 compared to 1995.

Option D, SSB stable, but at low level.

Option E decreasing close to historical low.



At the current level of F , SSB is predicted to decrease in 1997. If F is increased, SSB will reach record low levels.

Management advice: To prevent further likely reductions in SSB to lowest recorded levels, ACFM recommends that fishing mortality in 1996 should be reduced by 20% from the 1994 level, corresponding to a catch of 800t in 1996. Management of this stock should be viewed in conjunction with Celtic Sea plaice.

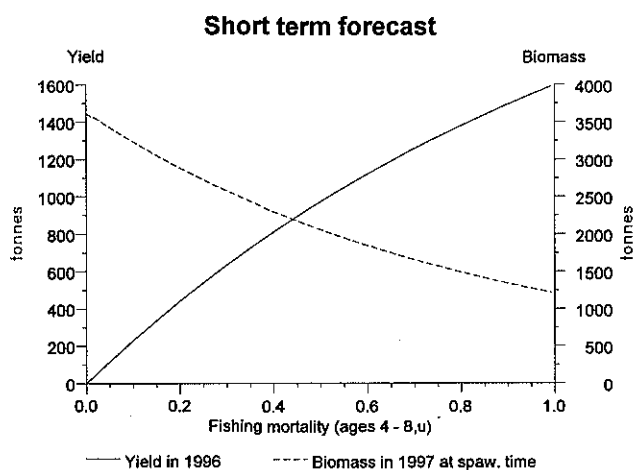
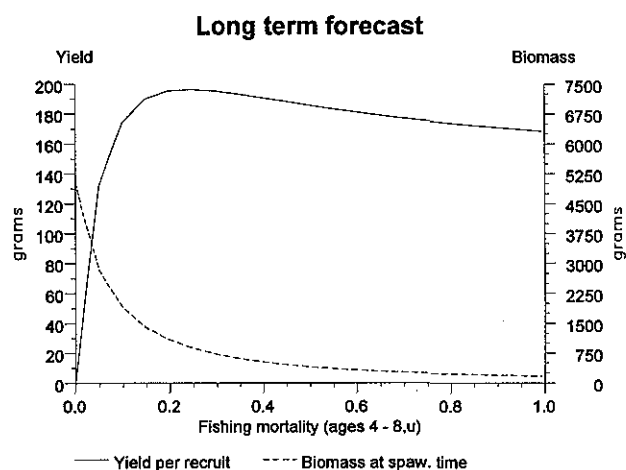
Special comments: Sole and plaice in the Celtic Sea are taken in the same fishery. If departure from *status quo* fishing mortality is implemented for either species, the implications

for the associated species should be considered (see combined catch forecast in Section 3.9.4). If the catch in 1996 is limited to 800t there is a high probability of reducing fishing mortality.

Data and assessment: Age-based analytical assessment using catch-per-unit effort data from two commercial fleets and one survey.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Yield and Spawning Stock Biomass



3.9.6 Cod in Division VIIe (Western English Channel)

Catch data (Table 3.9.6.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987			1.6
1988			2.7
1989			2.2
1990			1.3
1991			0.7
1992			0.7
1993		17.5	0.5
1994		17.0	0.6
1995	- ²	17.0	

¹TAC covers Sub-area VII (except Division VIIa).

²Precautionary TAC. Weights in '000 t.

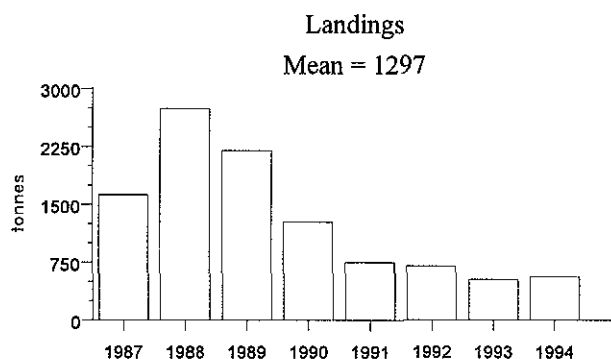
Historical development of the fishery: France and UK account for most of the landings. The catch in 1994 is only 19% of the catch in 1988 and 34% of the mean catch in the period 1987-1992. The TAC is for a wider area.

State of stock: Unknown; catches suggest that the stock may be at a very low level.

Management advice: If a TAC is to be implemented for this stock, in view of the recent decrease in landings a precautionary TAC should be set on the basis of recent catch levels.

Data and assessment: Age composition data available for less than half the total landings from 1988. No analytical assessment.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).



3.9.7 Whiting in Division VIIe (Western English Channel)

Catch data (Table 3.9.7.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987			2.3
1988			2.7
1989			1.8
1990			1.9
1991			2.1
1992			1.5
1993		22.0	1.8
1994		27.0	1.8
1995		25.0	

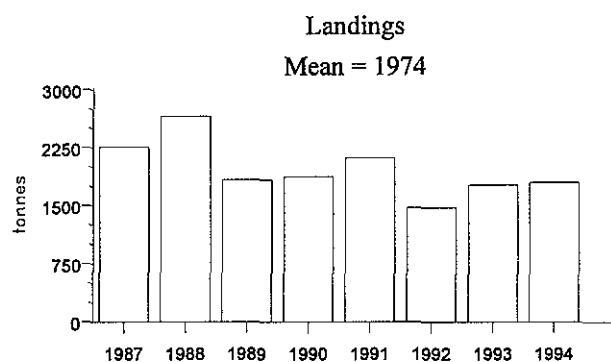
¹TAC for Sub-area VII (except Division VIIa). Weights in '000 t.

Historical development of the fishery: France and UK account for most of the landings. In recent years the proportion of the landings taken by UK has been increasing.

State of stock: Not known.

Data and assessment: Data not available for an analytical assessment.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).



3.9.8 Plaice in Division VIIe (Western English Channel)

Catch data (Table 3.9.8.1):

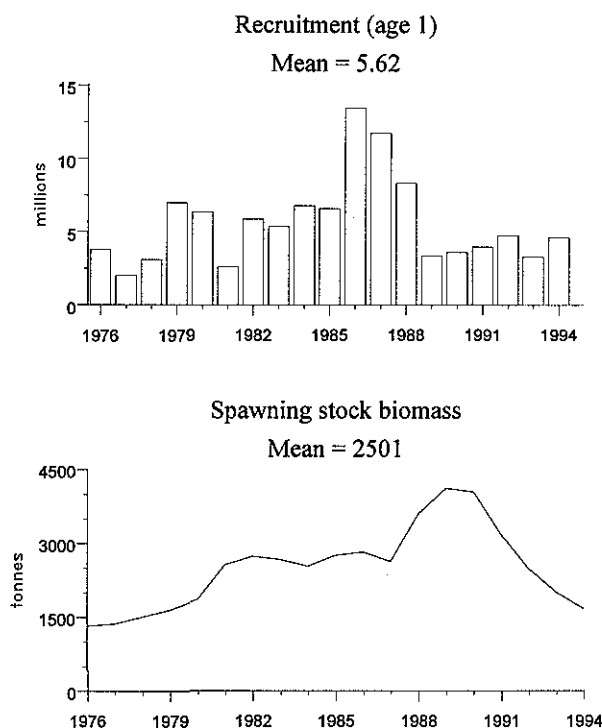
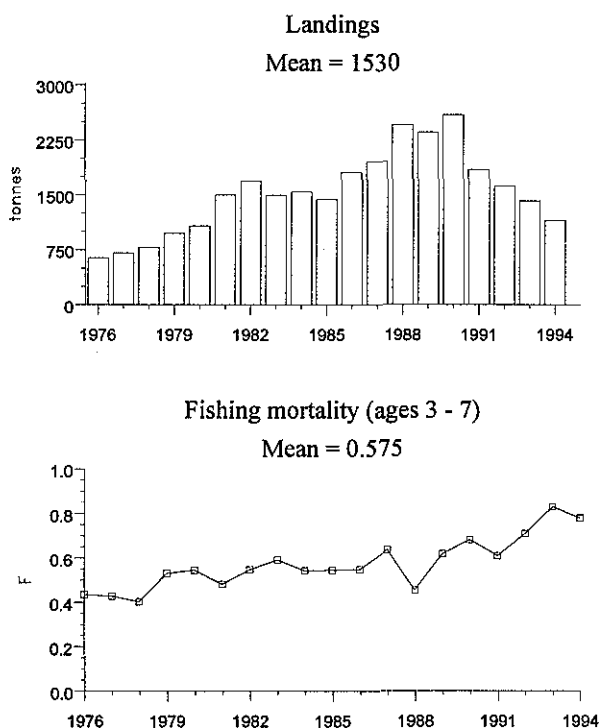
Year	Rec. TAC ¹	Agreed TAC ¹	Official landings	ACFM catch
1987	6.8	8.3	1.9	2.0
1988	6.9	9.96	2.4	2.5
1989	11.7	11.7	2.2	2.4
1990	10.7	10.7	n/a ²	2.6
1991	8.8	10.7	n/a ²	1.8
1992	-	9.6	n/a ²	1.6
1993	-	8.5	n/a ²	1.4
1994	-	9.1	n/a ²	1.2
1995	1.4	8.0		

¹TACs for Divisions VIIe, e. ²Not reported for all countries. Weights in '000 t.

Historical development of the fishery: Landings are taken mainly by the UK fishery and were stable at a low level between 1950 and the mid-1970s. Landings increased rapidly after 1978 as beam trawls began to replace otter trawls, though plaice are mainly taken as a by-catch in beam trawls directed at sole and anglerfish. Landings reached a peak in 1988-1990 due to increased exploitation, but have since declined rapidly.

State of stock: The stock is close to or outside safe biological limits. SSB reached a peak level in 1989-1990, following a series of good year classes in the mid 1980s, but has declined rapidly and is close to lowest recorded levels. This is due to both high fishing mortality and low recruitment. There is evidence that recruitment is reduced at low SSB. Fishing mortality has been increasing throughout the assessment period, is currently close to a record high and is above F_{med} (0.62).

Further details in Table 3.9.8.2.



Forecast for 1996:

SSB(95) = 1.59 , F(95) = 0.78 , Basis: F(95)= F(94) ,
Catch(95) = Landings (95) = 1.20.

Recruitment of the 1994 and 1995 year classes set equal to the geometric mean for the period 1976-1992.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4F ₉₄	0.31	1.51	-	0.58	2.15
B	0.6F ₉₄	0.47	-	-	0.82	1.93
C	0.8F ₉₄	0.62	-	-	1.03	1.75
D	1.0F ₉₄	0.78	-	-	1.21	1.58
E	1.2F ₉₄	0.94	-	-	1.38	1.44

Weights in '000 t.

Under options A-D, SSB is expected to increase in 1997 compared to 1995. At the current fishing mortality rate, SSB is expected to remain close to historically low levels.

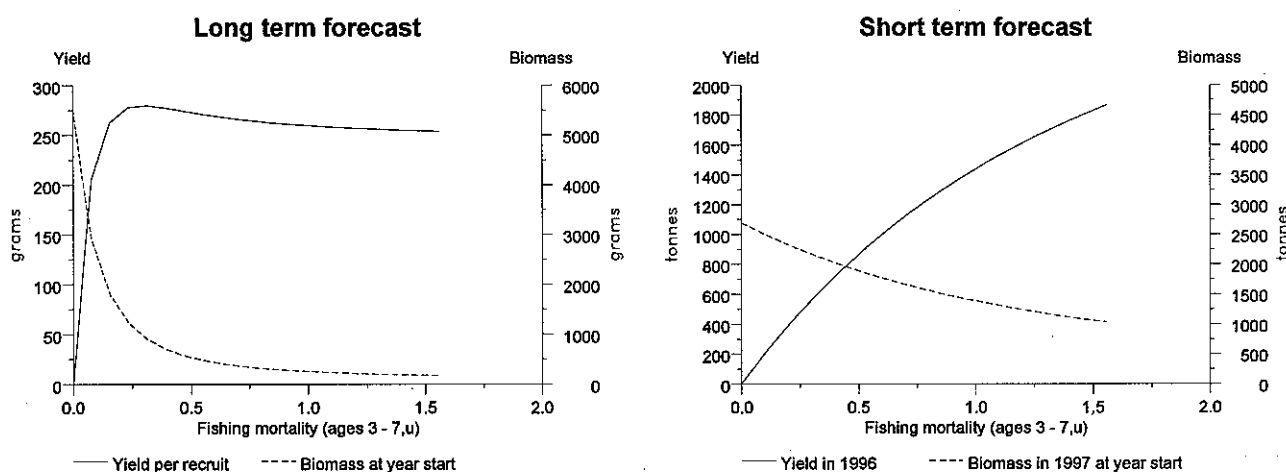
Management advice: Given the state of the stock, ACFM recommends that fishing mortality in 1996 should be reduced by 60% from the 1994 level in order to produce a significant increase in SSB.

Special comments: The TAC is set for Divisions VIId,e combined, so the results from this assessment need to be considered along with the much larger Division VIId stock. Given that the Division VIId component dominates the TAC a catch control is unlikely to constrain F on this stock. To achieve a decrease in fishing mortality, a direct reduction in fishing effort is necessary.

Data and assessment: Analytical age-based assessment based on landings, survey and (revised) commercial CPUE data. Mis-reporting occurred in the past but there is no information on any recent problems.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Yield and Spawning Stock Biomass



3.9.9 Sole in Division VIIe (Western English Channel)

Catch data (Table 3.9.9.1):

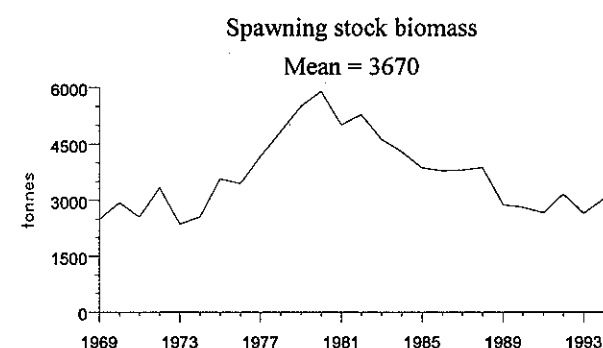
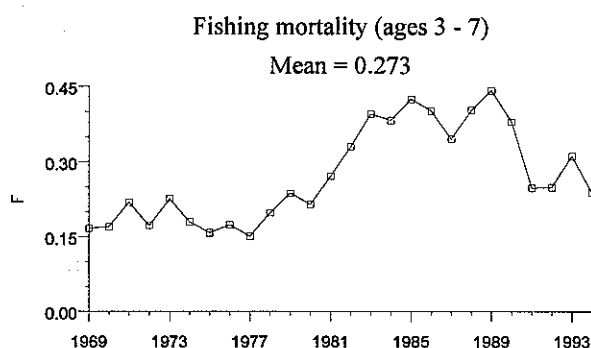
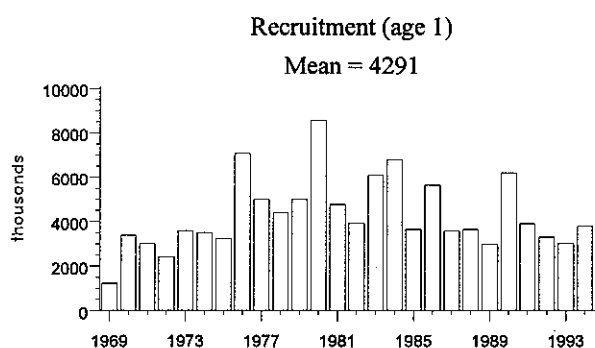
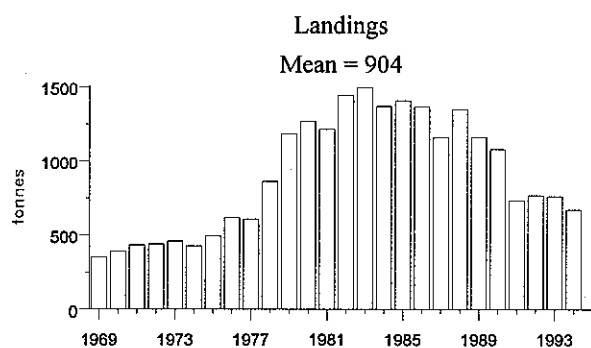
Year	Rec TAC	Agreed TAC	Official landings	ACFM catch
1987	1.3	1.15	1.1	1.2
1988	1.3	1.3	0.9	1.4
1989	1.0	1.0	0.8	1.2
1990	0.9	0.9	0.8	1.1
1991	0.54	0.8	0.6	0.7
1992	0.77	0.8	0.6	0.8
1993	0.7	0.9	0.7	0.8
1994	1.0	1.0	0.7	0.7
1995	0.86	0.95		

Weights in '000 t.

Historical development of the fishery: UK and France account for most of the landings. UK landings were stable at a low level between 1950 and the mid-1970s but increased rapidly after 1978 as beam trawls began to replace otter trawls in this fishery. Sole tends to be the target species with plaice and other species taken as by-catches. These are relatively more important in the otter trawl fishery. Total landings reached a peak in the early 1980s boosted initially by high recruitment in the late 1970s and later by an increase in the exploitation level.

State of stock: The stock is considered to be close to safe biological limits. SSB has declined since 1980 due to high fishing mortality and poor recent recruitment. It has remained stable at a low level since 1989. The 1989 year class was strong but subsequent year classes have been average or below average. There is evidence that recruitment is reduced at low SSB. Although fishing mortality has declined in recent years, it remains higher than levels in the early 1970s. Current F appears to be in the region of F_{med} (0.25). The lower values of recruitment at present low levels of SSB are a cause for concern.

Further details in Table 3.9.9.2.



Forecast for 1996:

SSB(95) = 3.00, $F(95) = 0.24$, Basis: $F(95)=F(94)$, $Catch(95) =$, Landings (95) = 0.66.

Recruitment of the 1994 and 1995 year classes set equal to the geometric mean for the period 1969-1992.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	$0.4F_{94}$	0.10	3.08		0.29	3.60
B	$0.6F_{94}$	0.14			0.43	3.46
C	$0.8F_{94}$	0.19			0.56	3.32
D	$1.0F_{94}$	0.24			0.68	3.19
E	$1.2F_{94}$	0.29			0.80	3.07

Weights in '000 t.

SSB is expected to increase above the current low level for all options. For options A and B, SSB is expected to be close to average in 1997.

Management advice: To increase the SSB, ACFM recommends that fishing mortality in 1996 should be reduced below the 1994 level.

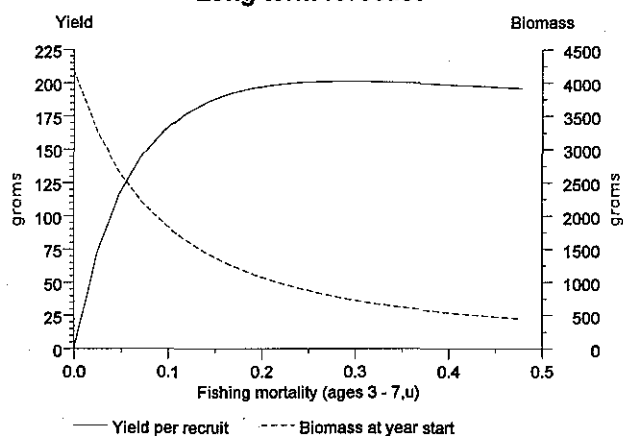
Special Comment: In both sole and plaice in this area there appears to be some evidence that recruitment is reduced at low spawning stock sizes. Fisheries for sole also take plaice as a by-catch. This needs to be taken into account in any management measures.

Data and assessment: Analytical assessment based on landings, survey and commercial CPUE data. Misreporting of landings occurred in the past but there is no information on any recent problems.

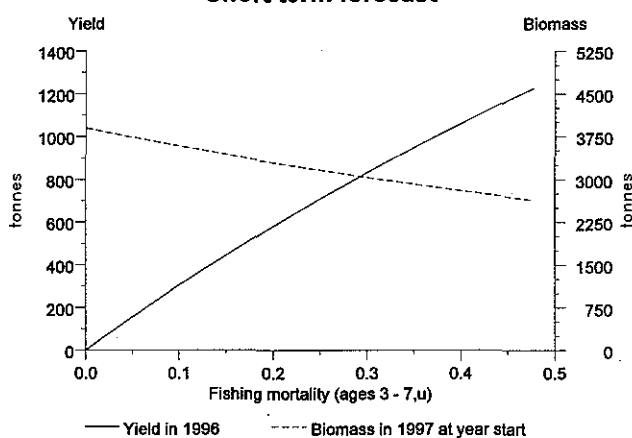
Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Yield and Spawning Stock Biomass

Long term forecast



Short term forecast



3.9.10 Sole in Divisions VIIla,b (Bay of Biscay)

Catch data (Table 3.9.10.1):

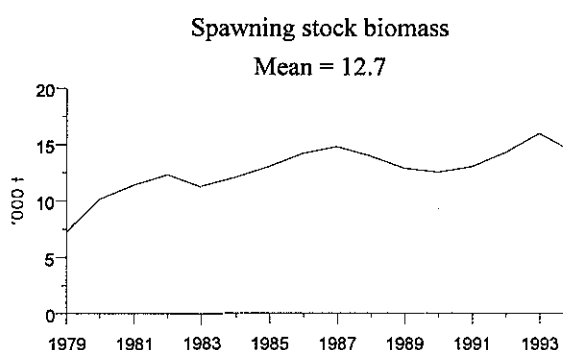
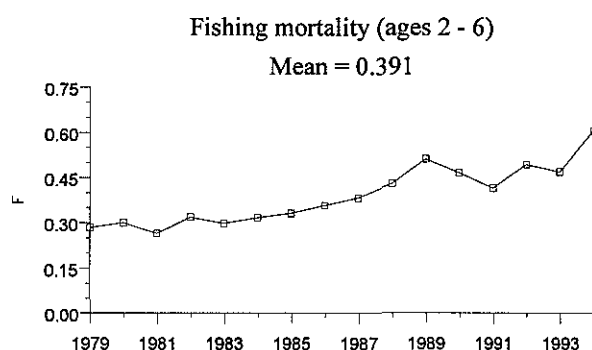
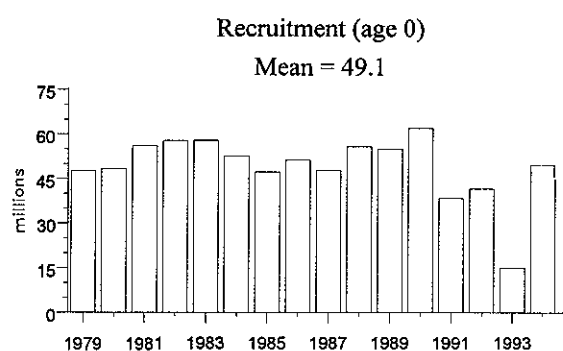
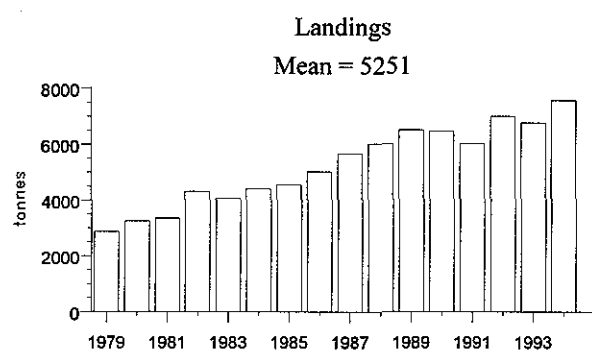
Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM Indgs.	Disc. slip.	ACFM catch
1987	-	4.4	4.4	5.1	0.6	5.7
1988	3.7	4.0	4.5	5.4	0.6	6.0
1989	4.5	4.8	5.8 ¹	5.8	0.7	6.5
1990	5.1	5.2	5.5 ¹	5.9	0.6	6.5
1991	4.7	5.3	4.7 ¹	5.6	0.5	6.0
1992	5.0	5.3	6.4 ¹	6.6	0.5	7.0
1993	-	5.7	6.0	6.4	0.4	6.8
1994	-	6.6	6.9	7.2	0.4	7.6
1995	5.4 ²	6.6				

¹Not reported for all countries. ²Landings at *status quo* F. Weights in '000 t.

Historical development of the fishery: Catches have increased continuously in the last two decades. Since 1984, the French gill-net and trammel-net fishery expanded and it now accounts for 56% of the total landings. In contrast, catches of sole by small mesh shrimp trawlers decreased markedly.

State of stock: The time series is short, but the stock is considered to be within safe biological limits. SSB has fluctuated within a narrow range since the mid -1980s and in 1994 is above the long-term mean. Up till 1990 recruitment remained remarkably stable but the 1991 and 1992 year classes appear to be below average and, based on preliminary observations, the 1993 year class may be exceptionally poor.

Further details in Table 3.9.10.2.



Forecast for 1996:

SSB(95) = 12.8, $F(95) = 0.61$, Basis: $F(95) = F(94)$, Catch(95) = 6.5, Landings (95) = 6.2.

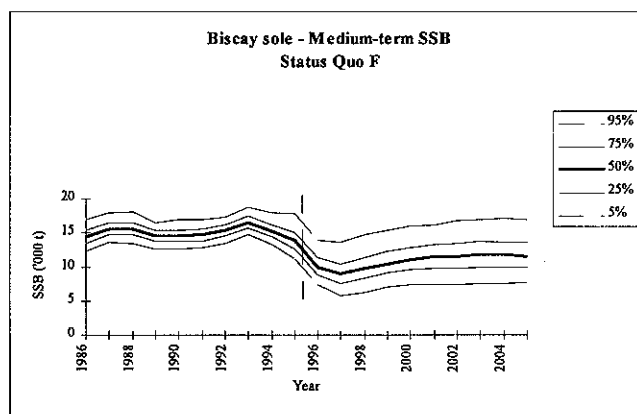
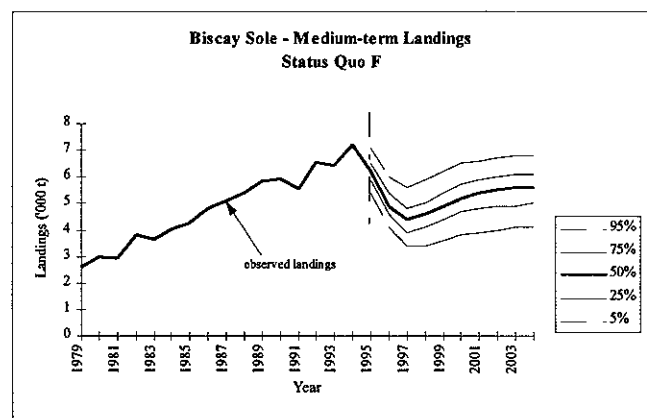
Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	$0.4F_{94}$	0.24	8.8	2.6	2.4	12.5
B	$0.6F_{94}$	0.36		3.7	3.4	11.2
C	$0.8F_{94}$	0.49		4.7	4.3	10.1
D	$1.0F_{94}$	0.61		5.5	5.0	9.1
E	$1.2F_{94}$	0.73		6.3	5.7	8.3

Weights in '000 t.

The SSB is predicted to decline substantially in the short term.

Under all options, SSB is expected to decline in 1997 compared to 1994. At the current level of F , SSB is predicted to be close to its lowest recorded level in 1996 and 1997. A 40% reduction in F would be required to produce a significant increase in SSB.

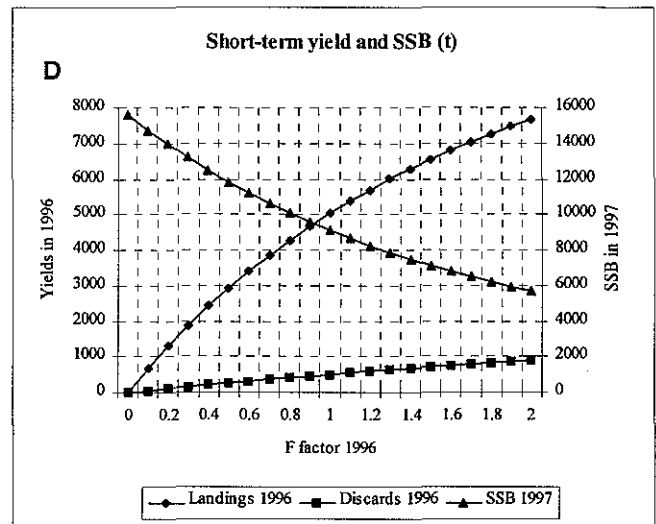
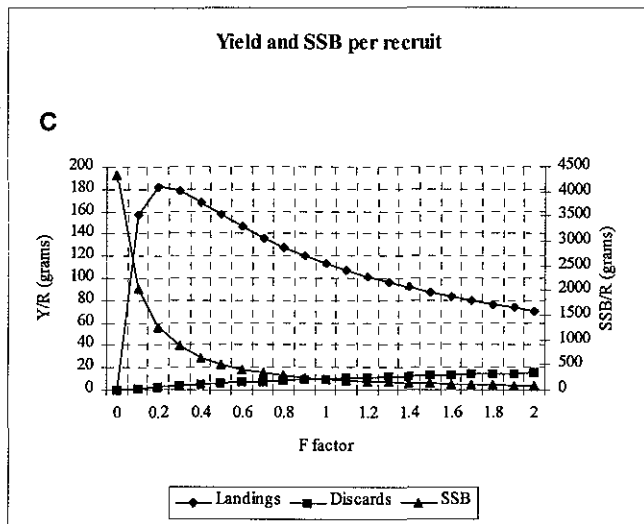
Medium-term considerations: Medium-term simulations show that, under *status quo* fishing mortality, landings are likely to decrease in the short term but they are projected to increase above the 1995 level over the medium term. SSB is predicted to decrease to its lowest recorded level in the short term and there is a high probability that it will not reach the recent average SSB level in the medium term (see figures below).



Management advice: In view of the increase in fishing mortality and decline in SSB, ACFM recommends that fishing mortality in 1996 should not be allowed to increase above the fishing mortality in 1994. This corresponds to landings of no more than 5000t in 1996.

Data and assessment: Analytical assessment based on landings and CPUE data. No recruitment indices are available for this stock. Data prior to 1984 are not considered reliable.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).



3.9.11 Celtic Sea and Division VIIj herring

Catch data (Tables 3.9.11.1–3.9.11.2):

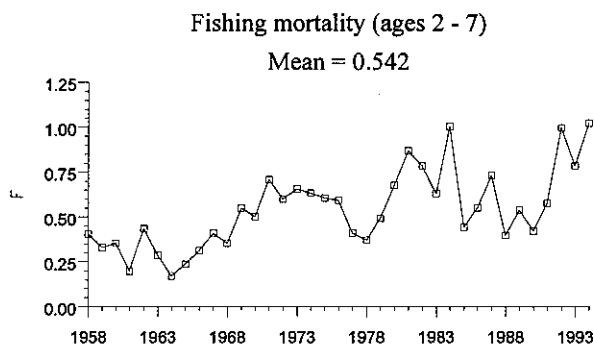
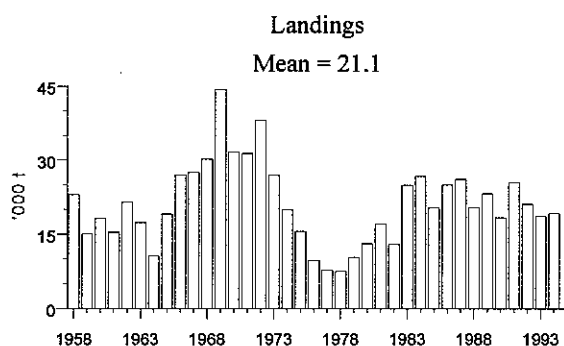
Year	Rec. TAC	Agreed TAC	Disc. slip	ACFM catch
1987	18	18	4.2	27.3
1988	13	18	2.4	19.2
1989	20	20	3.5	22.7
1990	15	17.5	2.5	20.7
1991	15	21	1.9	23.6
1992	27	21	2.1	23.0
1993	20-24	21	1.9	21.1
1994	20-24	21	1.7	19.1
1995	-	21		

Weights '000 t.

Historical development of the fishery: The fishery takes place on the spawning grounds in a "roe" fishery. The reported landings from the fishery appear to have been stable in recent years and discards have decreased.

State of stock: The state of the stock could not be determined precisely, but may be at, or outside, safe biological limits. There is a high probability that continuation of the current fishing mortality will reduce the spawning stock size to a point close to record low levels in the near future (Details in Table 3.9.11.3).

Landings by season (1 April of year indicated – 31 March of following year)



Forecast for 1996: Predictions were carried out assuming the TAC of 21,000 t in 1995 will be taken and using geometric mean recruitment.

$F(95) = 0.90$, Basis: TAC, $Catch(95) = 21.0$, $Landings(95) = 19.0$, $SSB(95) = 42.7$.

Optio n	Basis	F(96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.2 F(94)	0.21	39.8	5.4	4.9	47.0
B	0.4 F(94)	0.41	38.6	9.8	8.8	41.7
C	0.6 F(94)	0.63	37.6	13.6	12.2	37.4
D	0.8 F(94)	0.84	36.6	16.8	15.1	33.9
E	1.0 F(94)	1.04	35.6	19.5	17.8	31.0
F	TAC	1.17	35.1	21.0	19.0	29.8
	96=21.0					

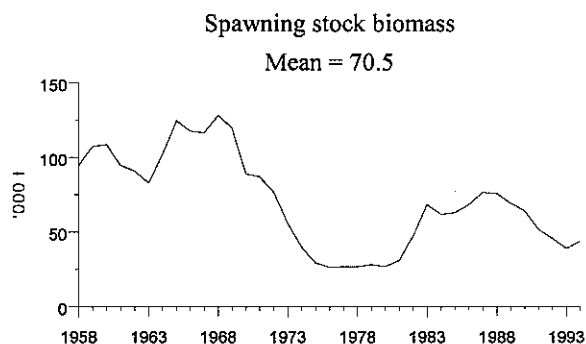
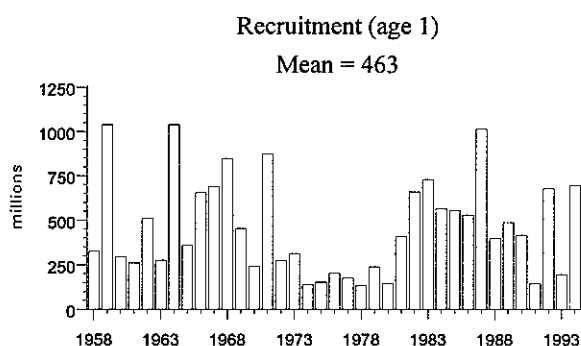
Weights in '000 t.

A-B SSB maintained at present level.

C-F SSB decreases.

The prediction shows that there would be a serious decline in stock size at the present level of fishing. Severe reductions in catch are required to prevent the stock falling below its present level.

Management advice: ACFM recommends that F be reduced by 60% from the 1994 value corresponding to a catch in 1996 of 9,800 t.



Special comments: Based on present knowledge of this resource, a reduction in F is required to prevent a further decline in spawning stock biomass. Acoustic surveys in 1994 indicated a low index of stock size which was in agreement with reports from fishermen. The series is short, but the 1994 observation is the lowest in the five years of available data. The 1995 assessment indicates that the stock is considerably lower than estimated last year, the first time an analytical assessment was used for this stock. The stock in 1994 was composed mainly of young fish (1-3 ringers). Fishing mortality levels in 1993 and 1994 were extremely high (average 0.9).

Data and assessment: Recent catch sampling data are considered to be good, but there are doubts about catches in earlier years. Reports during the acoustic survey indicate that fish may have been distributed in an unusual manner, outside the survey area. These observations add to the uncertainty of the assessment.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13).

3.9.12 Sprat in Divisions VIIId,e

Catch data (Table 3.9.12.1):

Year	Agreed TAC	ACFM catch
1987	5	2.7
1988	5	5.5
1989	12	3.4
1990	12	2.1
1991	12	2.6
1992	12	1.8
1993	12	1.8
1994	12	3.1
1995	12	

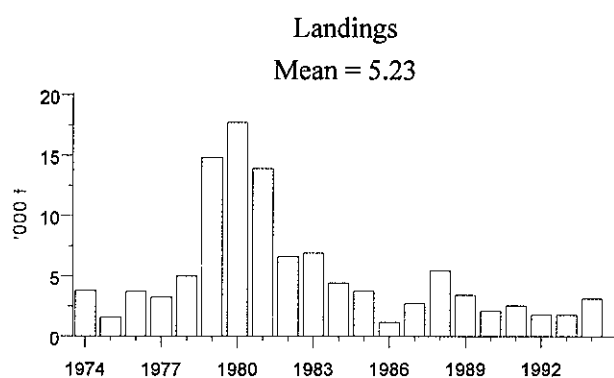
Weights in '000 t.

Historical development of the fishery: Landings increased to 3,100 t in 1994, in a fishery which has been at a low level (between 1,800 and 5,500 t) since 1987.

State of stock: The present state of the stock is not known.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13)

(Details in Table 3.9.12.2)



3.9.13 Megrim (*L. whiffiagonis*) in Divisions VIIb,c,e-k and VIIa,b

Catch data (Table 3.9.13.1):

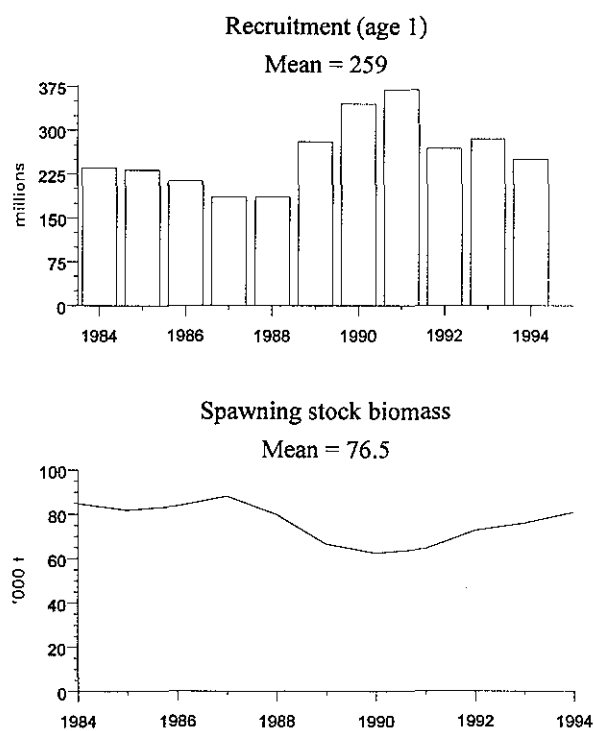
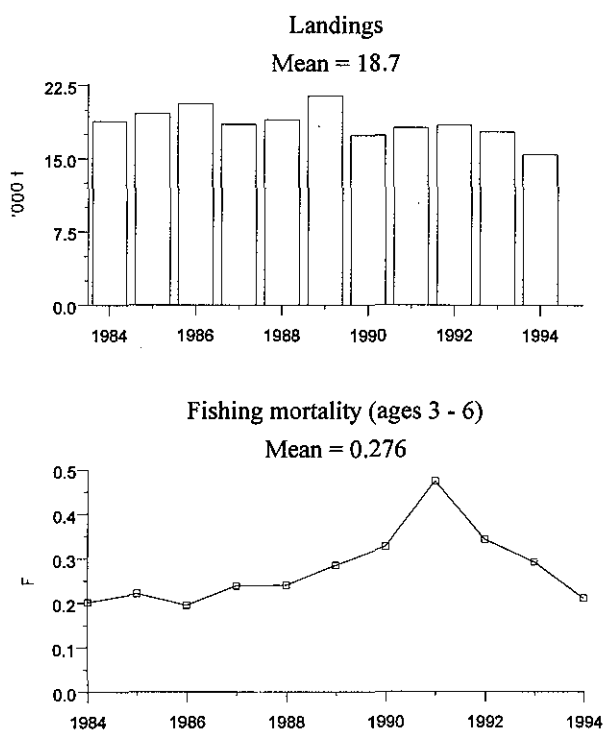
Year	Rec. TAC	Agreed TAC ¹	ACFM Indgs.	Disc. slip.	ACFM catch
1987	-	16.46	16.8	1.7	18.5
1988	-	18.1	17.3	1.7	19.0
1989	-	18.1	18.9	2.6	21.5
1990	-	18.1	14.1	3.2	17.4
1991	-	18.1	15.0	3.2	18.2
1992	-	18.1	15.5	2.9	18.4
1993	-	21.46	14.8	3.0	17.8
1994	-	20.33	13.1	2.3	15.4
1995	-	22.59			

¹Includes Division VIIa. ²Landings at *status quo* F. Weights '000 t.

Historical development of the fishery: Megrim is caught predominantly by Spanish, French, Irish and U.K. demersal trawlers. For most fleets megrim is a by-catch caught with hake, anglerfish, *Nephrops*, cod and whiting. Landings have remained relatively stable over the whole period. Discards are estimated to be about 15% of total catches by weight and comprise fish over a large range of sizes.

State of stock: The time series is short, but the stock appears to be within safe biological limits. SSB was below average in 1989-1992, but increased in 1993 and 1994. Fishing mortality has declined from the high 1991 level. Recruitment has been quite stable; the 1989 and 1990 year classes are well above average.

Further details in Table 3.9.13.2.



Forecast for 1996:

SSB(95) = 90.7, $F(95) = 0.21$, Basis: $F(95)=F(94)$, Catch(95) = 17.1, Landings (95) = 14.7.

Recruitment of the 1992, 1993 and 1994 year classes set equal to the geometric mean for the period 1984-1991 period.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	$0.4F_{94}$	.08	97.3	8.1	7.1	114.3
B	$0.6F_{94}$	.13		11.9	10.5	109.6
C	$0.8F_{94}$	.17		15.5	13.6	105.2
D	$1.0F_{94}$	.21		18.9	16.6	101.0
E	$1.2F_{94}$	.25		22.2	19.5	97.0

Weights in '000 t.

For all options SSB remains high.

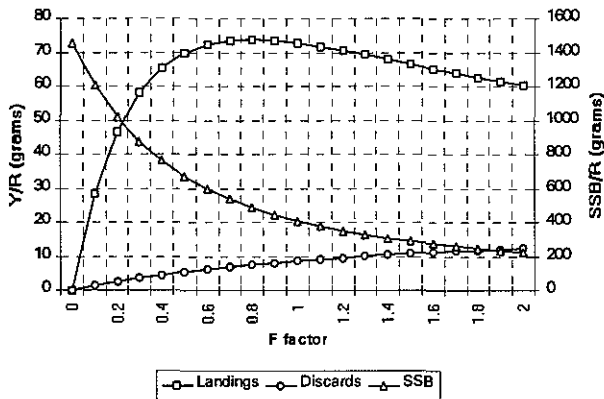
Management advice: There are no long-term gains in yield expected by increasing fishing mortality.

Special comments: It is noted that a large proportion of the catch is composed of megrim less than 25 cm. This may not yet be a problem for the stock, but indicates a poor exploitation pattern. An improvement in the exploitation pattern will lead to an increase in long-term yield. Catches of *L. boscii* represent about 5% of the total megrim catch.

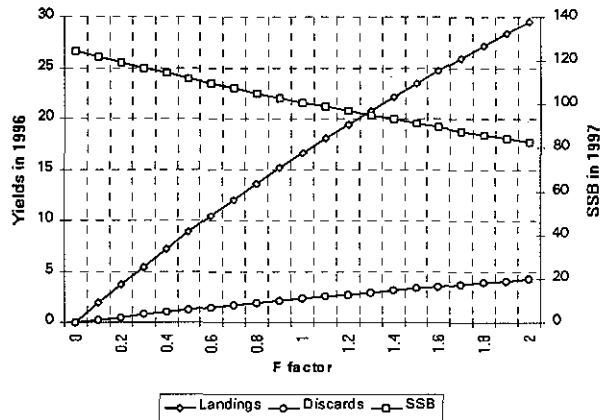
Data and assessment: Age-based analytical assessment using catch-per-unit effort from four commercial fleets and one survey.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Megrim whiffiagonis in Divisions VII and VIIIa,b
Yield and SSB per recruit



Short-term yield and SSB ('000 t)



3.9.14 Anglerfish in Divisions VIIb-k and VIIId,e (*L. piscatorius* and *L. budegassa*)

Catch data (Tables 3.9.14.1-5):

Year	Rec. TAC ³	Agreed TAC ¹	ACFM catch	Catch of <i>L. piscat.</i>	Catch of <i>budeg.</i>
1987	-	39.08	27.0	19.1	7.9
1988	-	42.99	27.4	17.7	9.6
1989	-	42.99	28.3	18.6	9.7
1990	-	42.99	27.3	18.1	9.1
1991	-	42.99	24.7	16.1	8.6
1992	-	42.99	21.1	13.2	7.9
1993	-	25.1 ²	19.4	13.1	6.2
1994	-	23.9 ²	21.9	16.1	5.8
1995	20.0	23.2 ²			

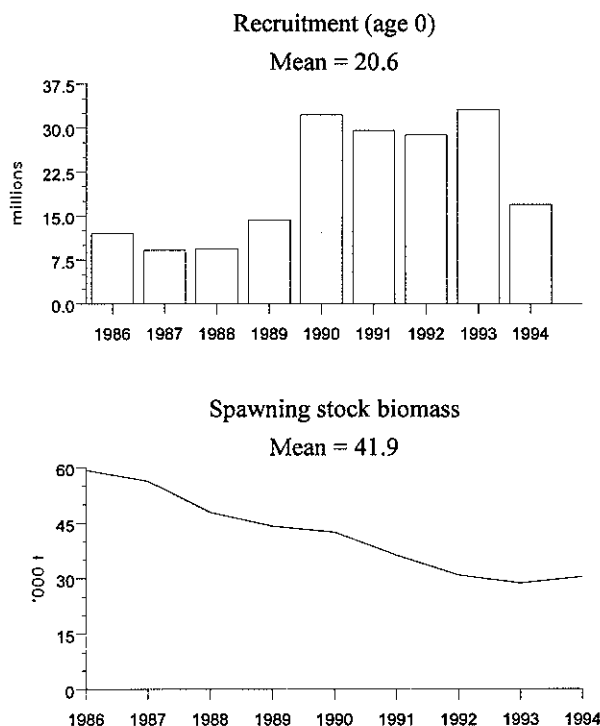
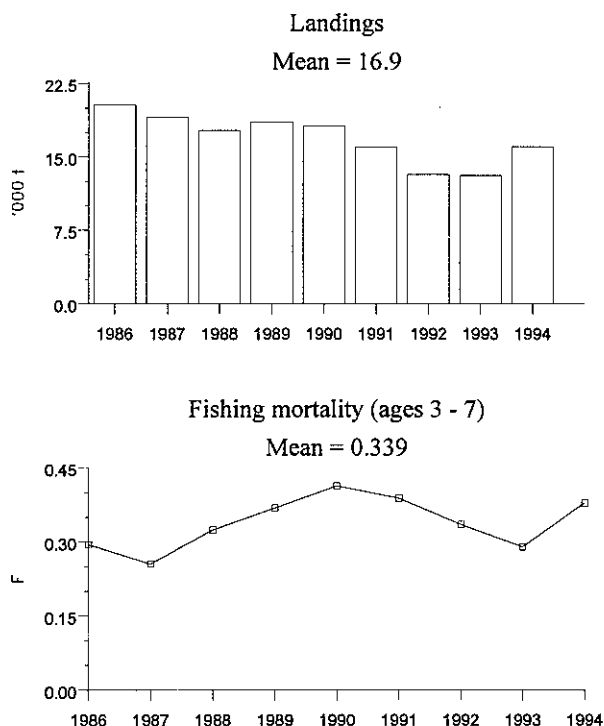
¹Includes Division VIIa; applies to both species. ²Includes Divisions VIIId,e. ³Applies to both species. Weights in '000 t.

Historical development of the fishery: The fishery for anglerfishes developed in Sub-areas VII and VIII in the 1970s due to gear improvement, and overall annual landings may have attained 30-35,000 t by the early 1980s. The main exploiting nations are Spain and France. There has been an expansion of the gill net fishery in the last decade in the Celtic Sea. It seems also that that period coincided with high recruitments of both stocks. Even though fishing effort increased until 1990, landings decreased by 40% between 1985 and 1993.

L. piscatorius

State of stock: The time series is too short to determine whether the stock is inside or outside of safe biological limits. SSB decreased continuously until 1993 but recent good recruitment has apparently halted the decline.

Further details in Table 3.9.14.6



Forecast for 1996:

SSB(95) = 40.7, $F(95) = 0.38$, Basis: $F(95) = F(94)$, Catch(95) = -, Landings (95) = 19.0.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	$0.4F_{94}$	0.16	50.5	-	10.5	70.7
B	$0.6F_{94}$	0.23		-	15.1	65.3
C	$0.8F_{94}$	0.30		-	19.3	60.4
D	$1.0F_{94}$	0.38		-	23.1	55.9
E	$1.2F_{94}$	0.45		-	26.6	51.8

Weights in '000 t.

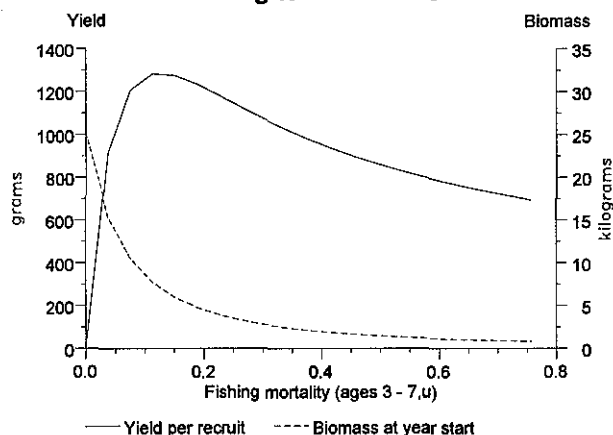
For all options given, SSB is predicted to increase in 1997 well above the average for 1986-1994. Continued fishing at the current level of F in 1996 will be accompanied by an increase in SSB in 1997, while landings continue to increase.

Special comment: *L. piscatorius* and *L. budegassa* are both caught on the same grounds by the same fleets, and often not separated in markets; therefore, management measures for *L. piscatorius* must be considered with respect to their impact on *L. budegassa*.

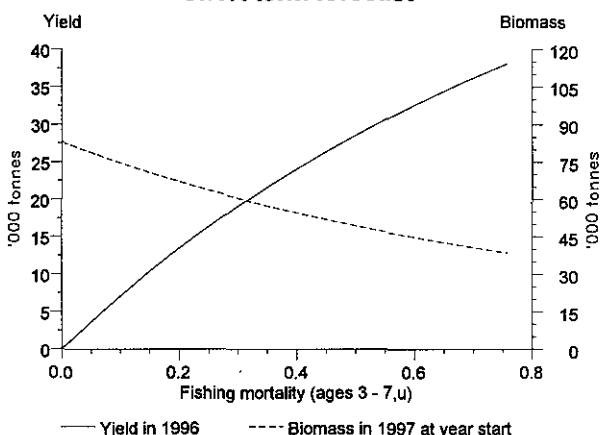
Data and assessment: Age-based assessment using CPUE and survey data. No recruitment indices are available for this stock, and average recruitment was assumed for the incoming year classes. However, short-term predictions are not sensitive to assumed recruitment.

Yield and Spawning Stock Biomass

Long term forecast



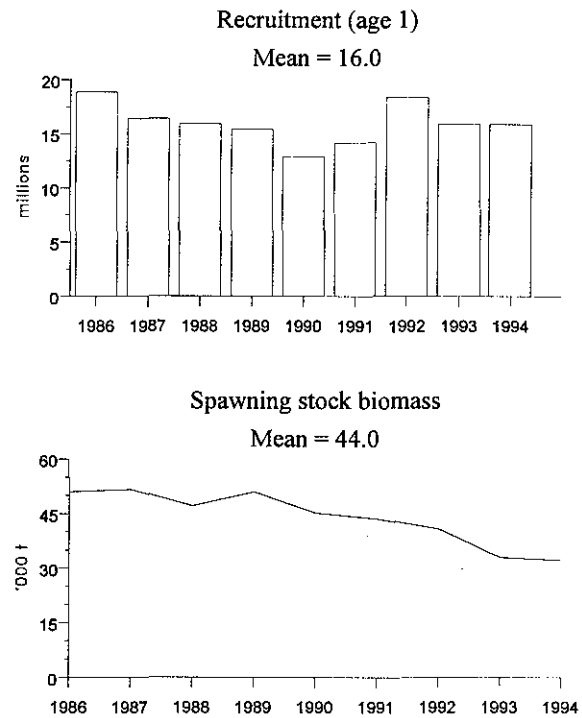
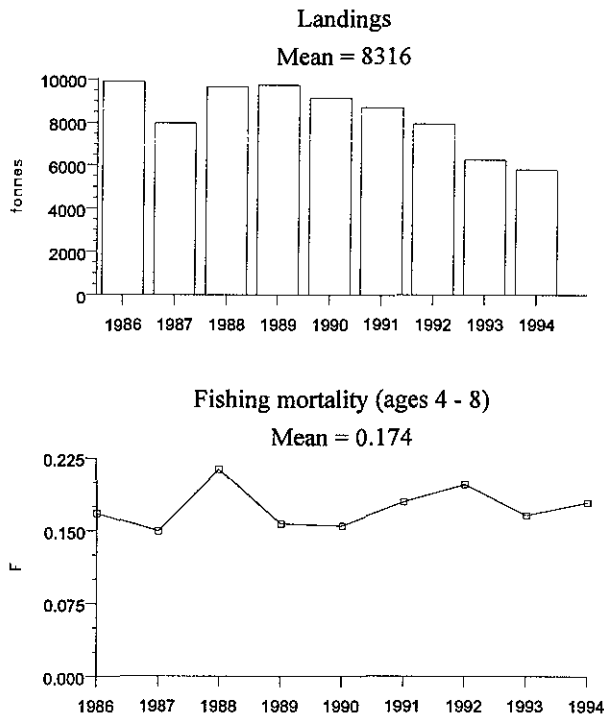
Short term forecast



L. budegassa

State of stock: The time series is too short to determine whether the stock is inside or outside safe biological limits. Landings and spawning stock biomass have decreased steadily since 1989.

Further details in Table 3.9.14.7.



Forecast for 1996:

SSB(95) = 32.0, F(95) = 0.18, Basis: F(95) = F(94)Catch(95) = -, Landings (95) = 5.9.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4F ₉₄	0.07	32.0	-	2.5	36.0
B	0.6F ₉₄	0.11		-	3.6	34.6
C	0.8F ₉₄	0.14		-	4.8	33.3
D	1.0F ₉₄	0.18		-	5.8	32.1
E	1.2F ₉₄	0.21		-	6.8	30.9

Weights in '000 t.

Continued fishing at the current level of F in 1996 is expected to result in stable landings in 1996 with no improvement of SSB in 1997.

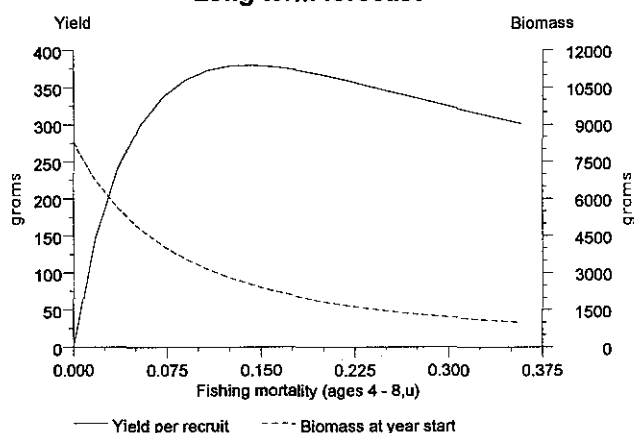
At options A to E, SSB is expected to be stable or to increase above the current low level.

Special comment: *L. piscatorius* and *L. budegassa* are both caught on the same grounds by the same fleets, and often not separated in markets; therefore, management measures for *L. budegassa* must be considered with respect to their impact on *L. piscatorius*.

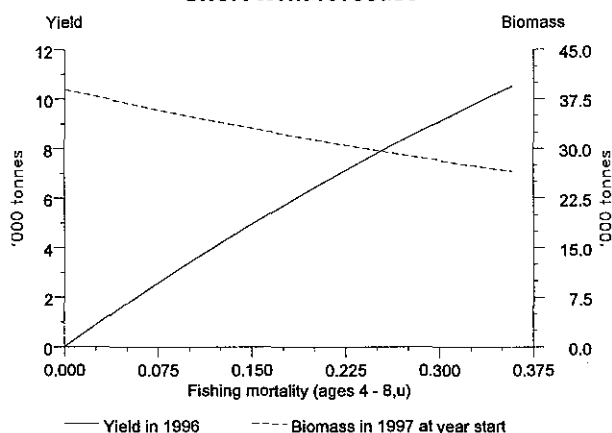
Data and assessment: Age-based assessment using the CPUE and survey data.

Yield and Spawning Stock Biomass

Long term forecast



Short term forecast



L. piscatorius and *L. budegassa*

A combined forecast diagram for both species is given below.

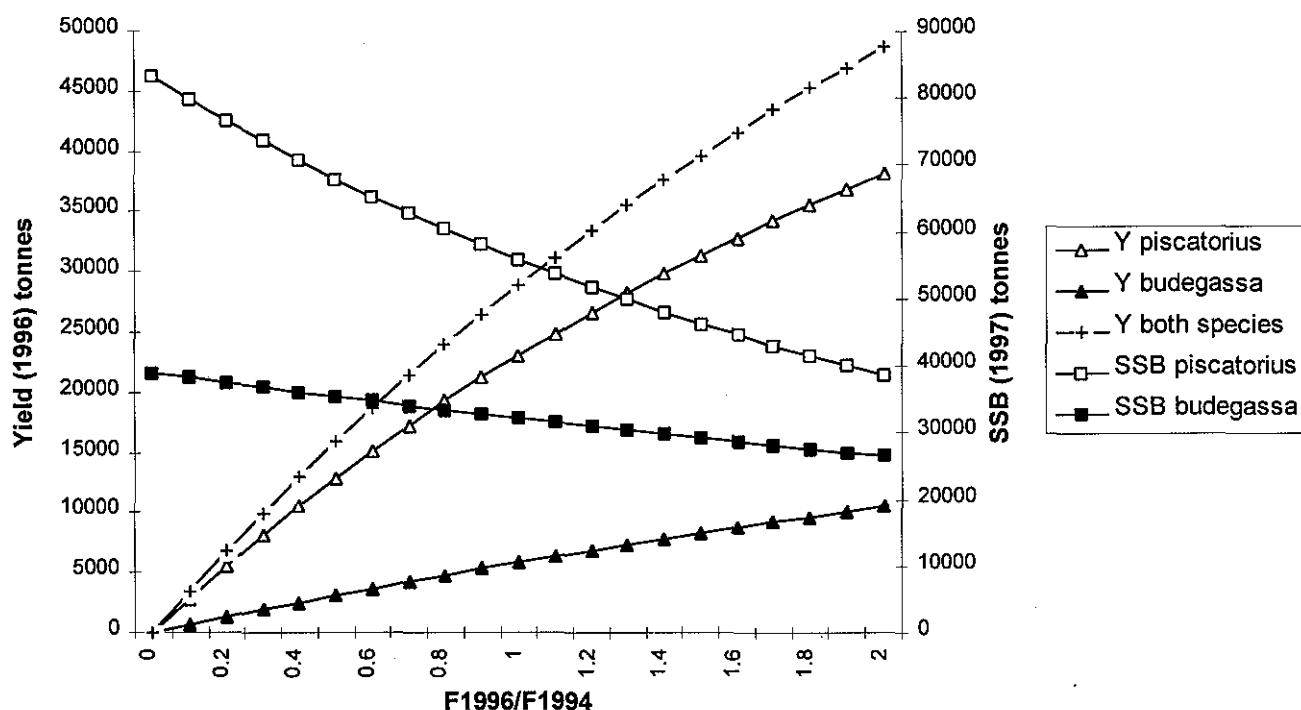
Management advice: No long-term gain is to be expected by increasing fishing mortality on these stocks. As the state of these stocks is not known in relation to safe biological limits, ACFM recommends that fishing mortality on these

stocks should not be allowed to increase.

Special Comment: The fishery has become heavily dependent on juvenile fish in recent years.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess: 5).

Anglerfishes (*L. piscatorius* and *L. budegassa*) in Divisions VIIb-k and VIII a,b
Combined Short Term Forecasts assuming Status Quo in 1995



3.9.15.a *Nephrops* in Divisions VIIf,g,h and VIIa Rectangles 33E2-E5

Units included in recommended Management Area: a) Celtic Sea (Units 20, 21 and 22 combined).

Catch data (Tables 3.9.15 a.1–3.9.15 a.2:

Year	Rec TAC	Agreed TAC ¹	ACFM landings
1987			3.4
1988			3.1
1989			4.0
1990			4.4
1991	3.83		3.3
1992	~3.8	20.0	4.3
1993	3.8	20.0	4.7
1994	3.8	20.0	4.7
1995	3.8	20.0	

(Weights in '000 t) ¹Sub-area VII

Historical Development of the Fishery: Landings and effort have shown an increasing trend 1988-1993 (graphs a, b). Effort fell in 1994, though landings did not.

State of stock: LPUE fell over 1989-1991, stabilised and rose in 1994 (graph c). Mean sizes in both catch and landings have been fluctuating without trend (graph d). Fishing mortality slightly increasing for both males and females. Current fishing mortality is estimated to be above F_{max} for both sexes (graph e); hence the stock is regarded as overexploited at present.

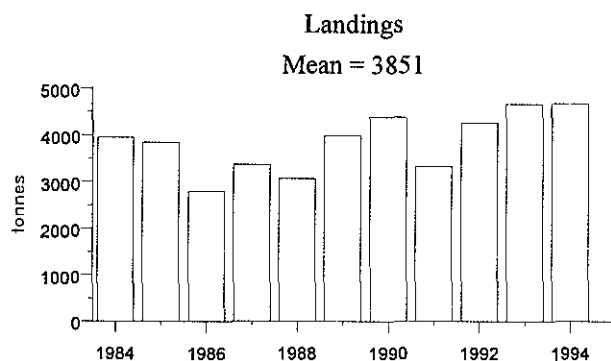
Management advice: ACFM advises a precautionary TAC of 3,800 t in 1996 and 1997.

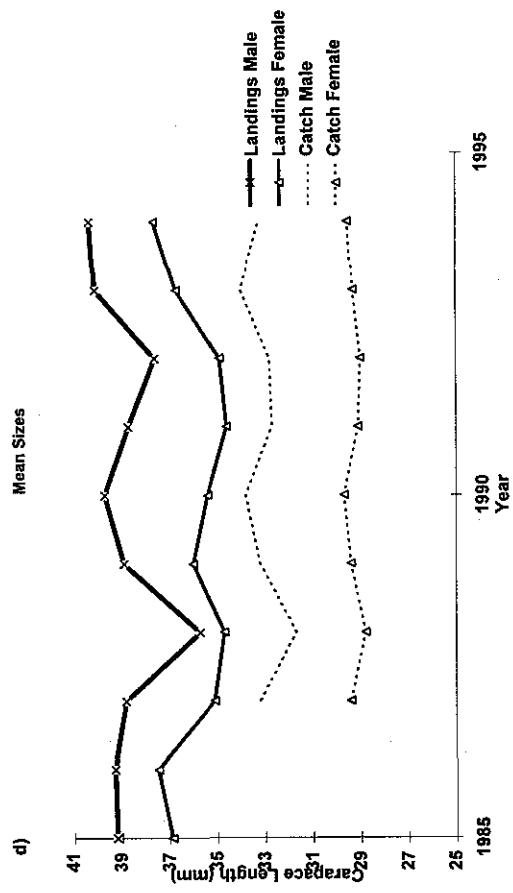
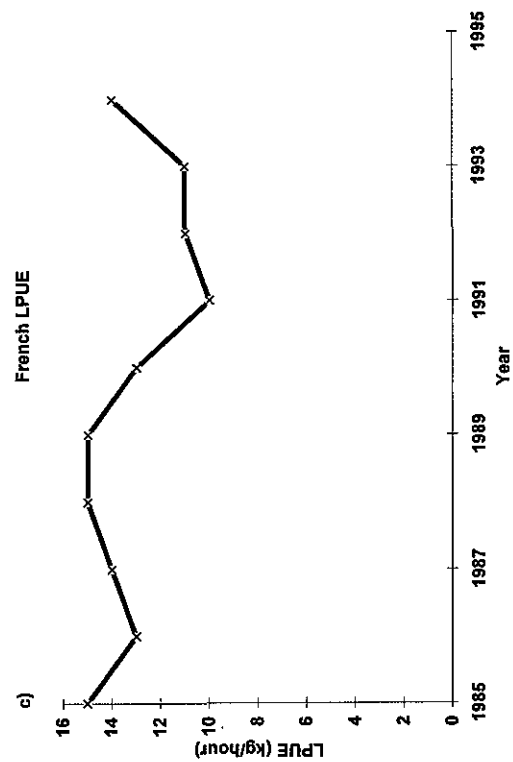
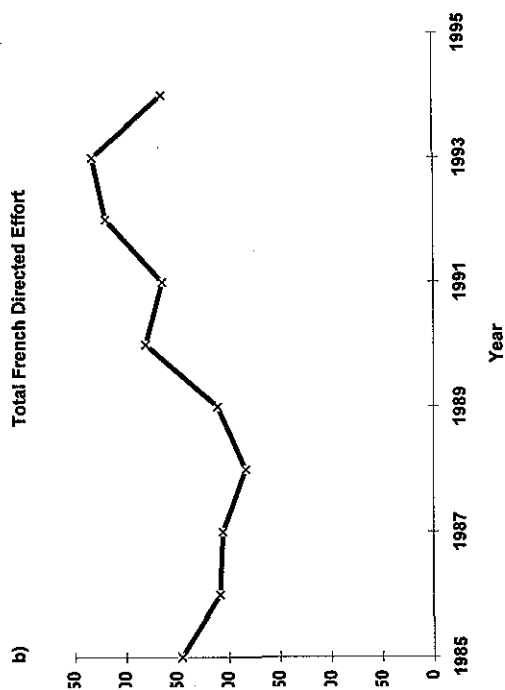
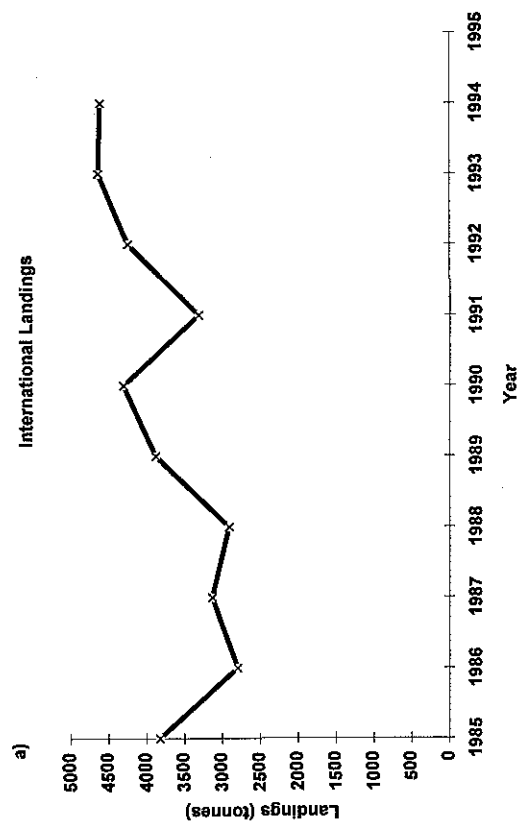
Special comments: ACFM advised a precautionary TAC of 3,800 t for the Management Area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. The Celtic Sea comprises three functional units which should ideally involve separate monitoring and assessment.

Data and assessment: LPUE, mean size data and length composition of catches available - changes in size at maturity and length composition of discards. Length-based and age-based assessments performed on both sexes, but not regarded as reliable.

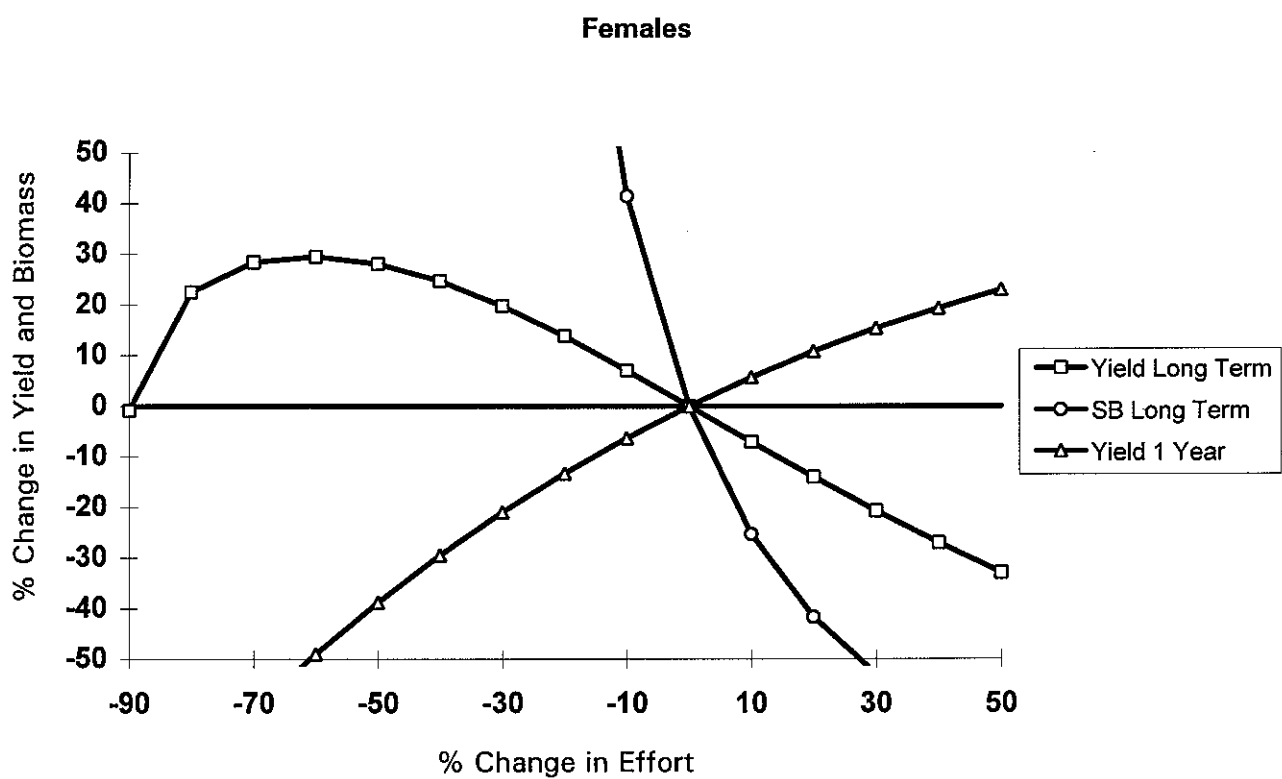
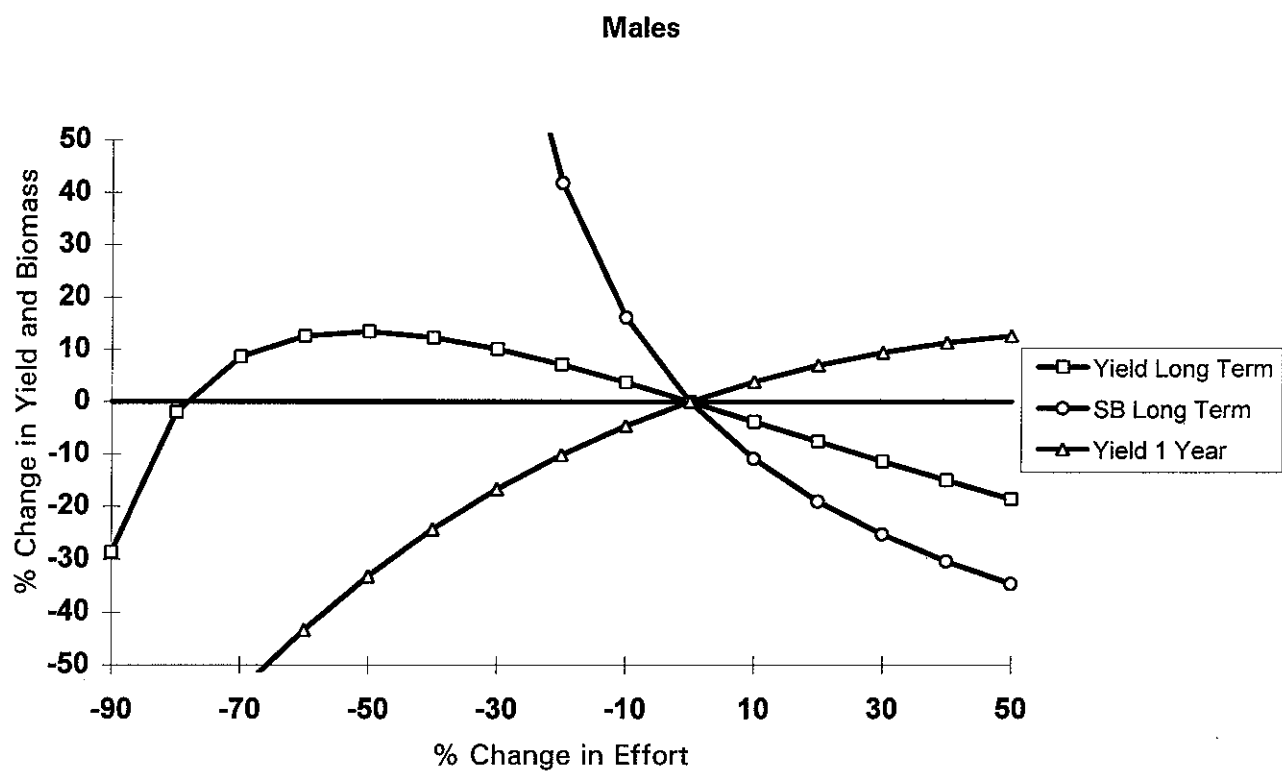
Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended management data.
(Details in Table 3.9.15 a.3).





Celtic Sea (FU's 20-22): Long term trends in French landings (tonnes), directed effort ('000 hours), LPUE (kg/hour) and mean size (mm CL) in landings and catch by sex.



Celtic Sea (FU's 20-22): Percentage changes in long term landings and stock biomass, and short term landings following various changes in fishing effort. Males and females shown separately.

3.9.15.b *Nephrops* in Divisions VIIIa,b

Units included in recommended Management Area: a) Bay of Biscay North (Unit 23) and b) Bay of Biscay South (Unit 24).

Catch data (Tables 3.9.15 b.1-3.9.15 b.2) :

Year	Rec TAC	Agreed TAC	ACFM landings
1987		7.5	5.7
1988		7.5	6.8
1989		7.5	5.4
1990		7.5	5.0
1991	5.19	6.5	4.8
1992	~6.80	6.8	5.7
1993	6.80	6.8	5.0
1994	6.80	6.8	3.6 ¹
1995	6.80	6.8	

(Weights in '000 t) ¹Provisional

Historical Development of the Fishery: Landings fluctuating without trend (graph a; 1994 value very provisional). Effort showed an increase up to 1992, thereafter decreasing (graph c).

State of stock: Total stock biomass may be slightly decreasing for both sexes based on VPA, though LPUE stable, increasing slightly in 1994 (graph c).

Fishing mortality for both males and females is fairly stable. Current F is estimated to be far above F_{max} for both sexes (graph e).

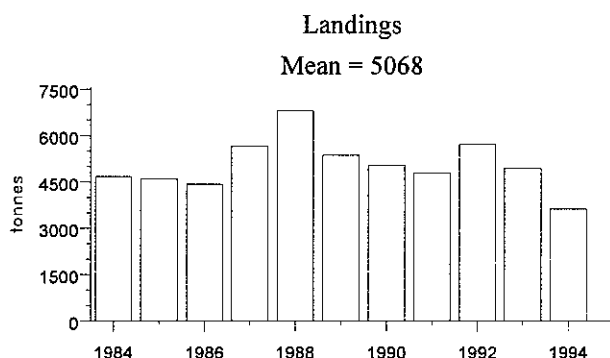
Management advice: ACFM advises a precautionary TAC of 6,800 t in 1996 and 1997.

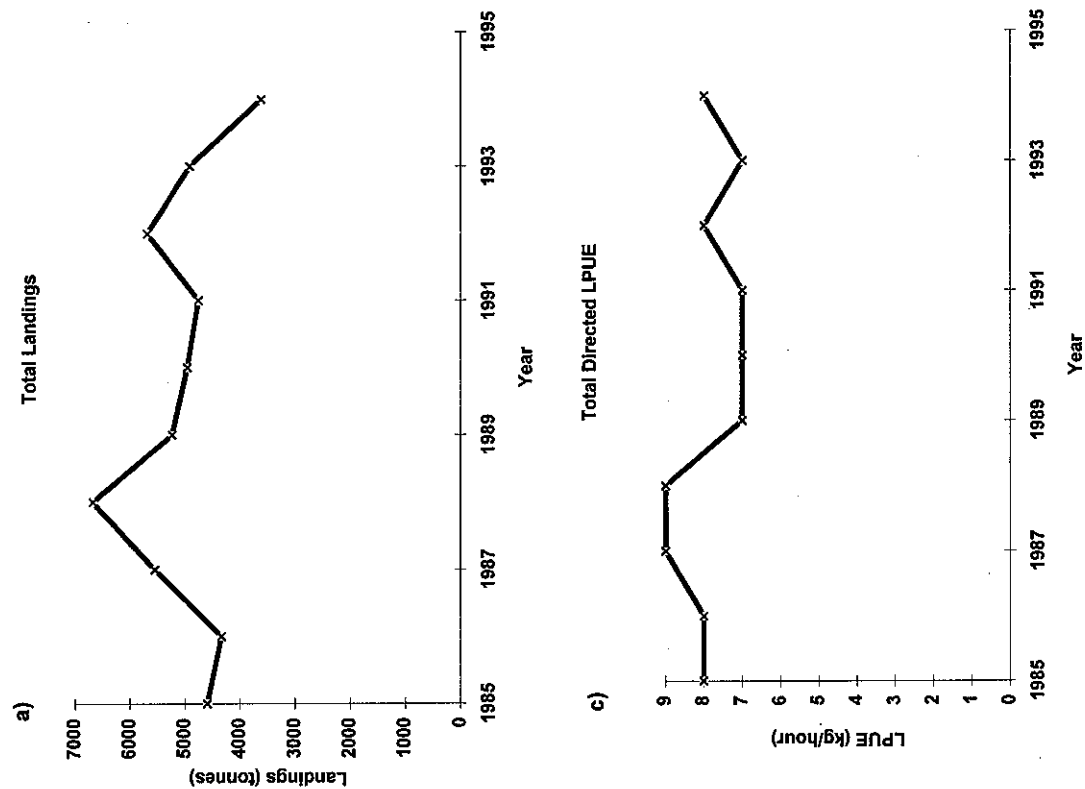
Special comments: ACFM advised a precautionary TAC of 6,800 t for the Management Area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. It should be noted that this recommended Management Area includes two functional units and that a TAC set for the entire area will not necessarily result in balanced exploitation between these two units.

Data and assessment: LPUE, length compositions of discards and landings and mean sizes (graph d) were available for Bay of Biscay North. Length-based assessments were carried out on data for the last four years. An age-based assessment based on slicing was also performed on the whole data set. The assessments are not considered reliable.

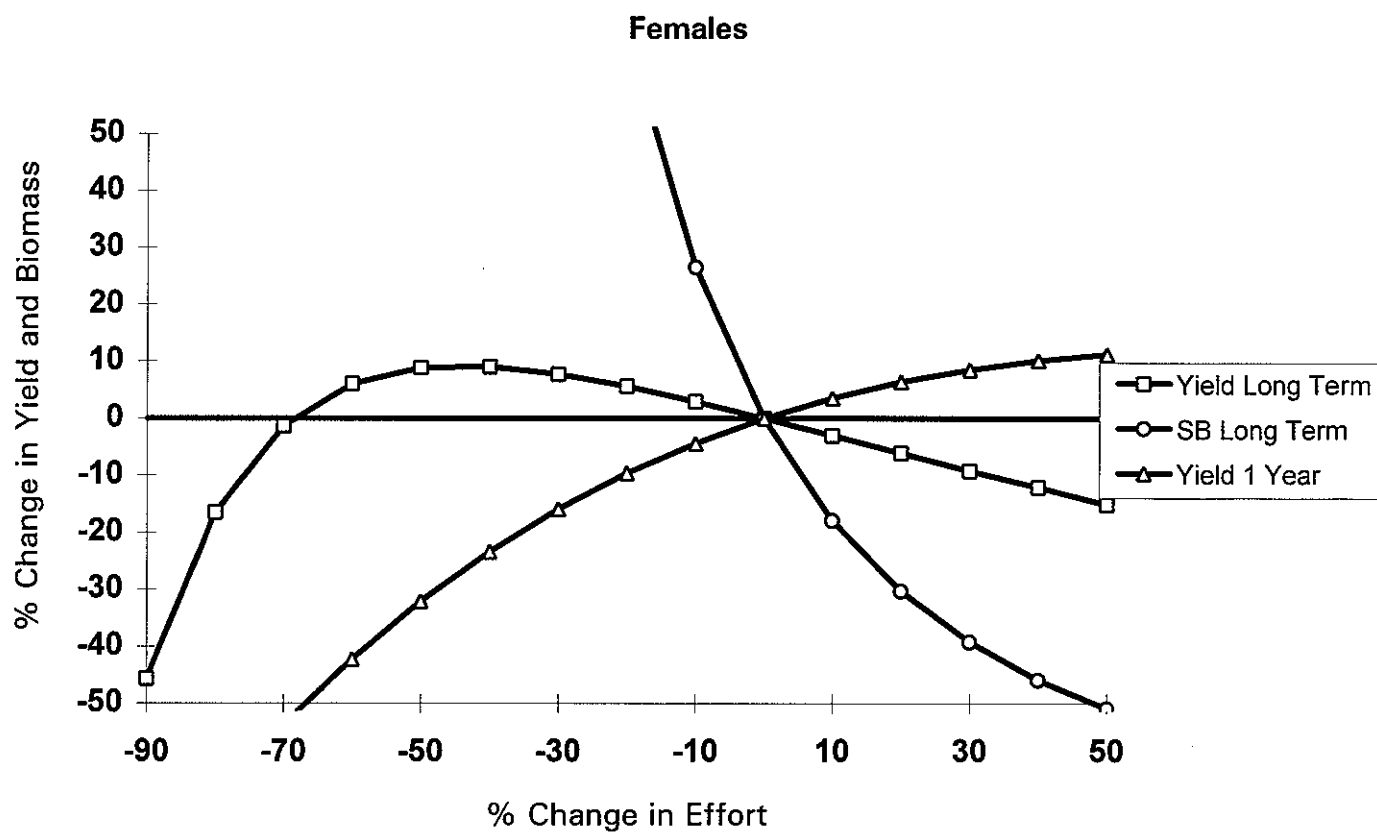
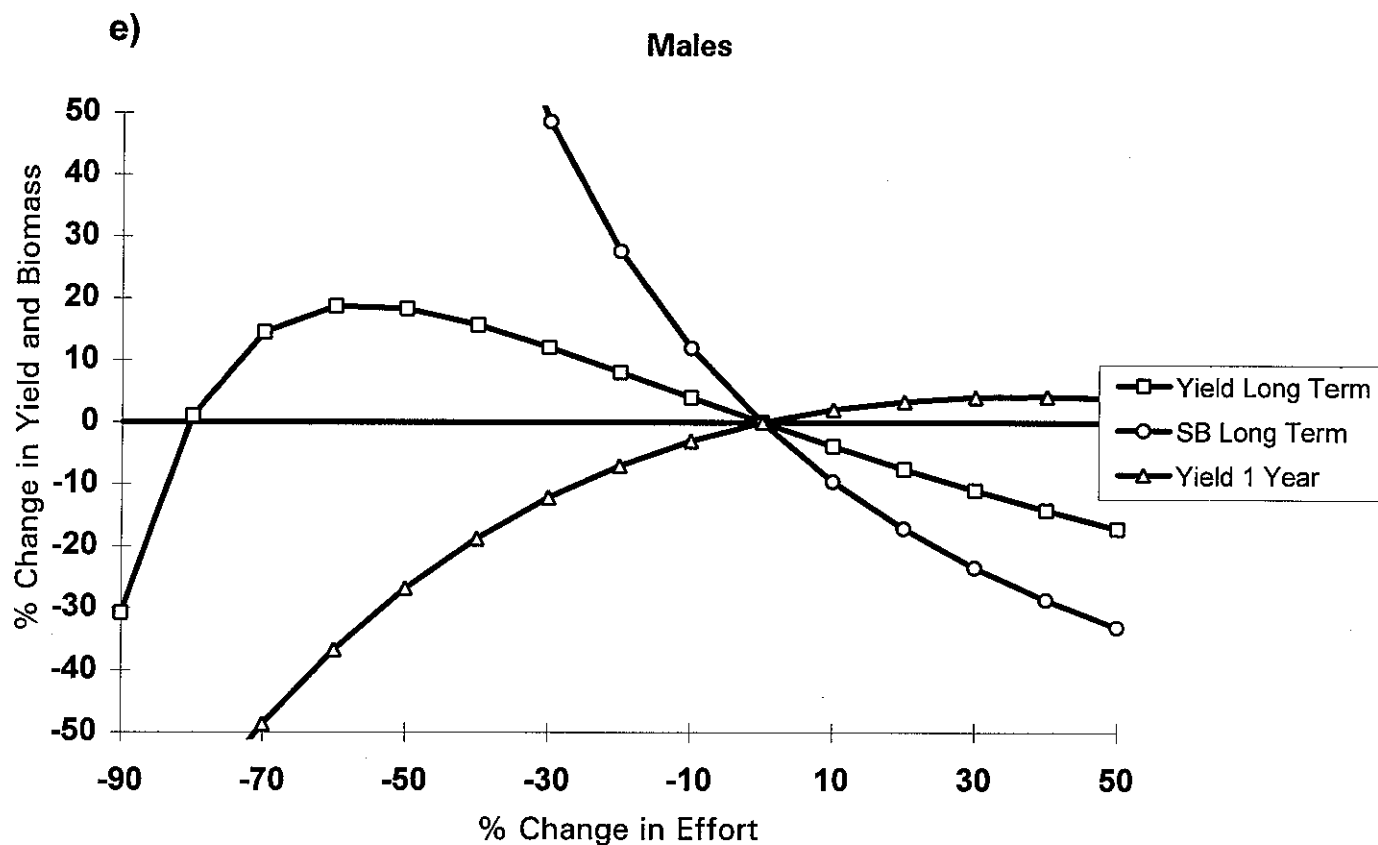
Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area.
(Details in Table 3.9.15 b.3)





Bay of Biscay (FU: 23-24). Long-term trends in French landings (tonnes), directed effort ('000 hours), CPUE (kg/hour) and mean sizes (mm CL) in landings and catch by sex.



Bay of Biscay (FU's 23-24): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Male and females shown separately.

3.9.15.c *Nephrops* in Divisions VIIId,e

Special comments: There are no reported landings of *Nephrops* from this area, so it is suggested that a zero TAC would prevent misreporting.

Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

3.10 Stocks in Divisions VIIb,c,h–k (West of Ireland)

3.10.1 Overview

The fishery in Division VIIbc is mainly a trawl fishery although some gill netting is carried out. The fishery in Divisions VIIh–k is also a trawl fishery but gill netting is increasing in importance in the area. These are mixed fisheries for cod, whiting, sole and plaice; and cod and whiting are taken as by-catch in the *Nephrops* fishery.

Landings in these ICES Divisions are difficult to interpret as several countries differ in the manner in which they report their landings data for the various ICES Divisions.

There are single cod and whiting TACs covering the whole of Divisions VIIb–k so that assessment areas do not correspond to management areas.

There are no analytical assessments carried out in this area but stock monitoring programmes and annual ground fish and young fish surveys have been put in place which will eventually permit analytical assessments.

These groups of fish may be only components of larger stock complexes.

There is a directed fishery for hake mainly in Divisions VIIh–k and an overview of hake is provided in Section 3.12.

Anglerfish and megrim are important species in this area but are assessed for Sub-areas VII and VIII. An overview is provided in Sections 3.9.13 and 14.

Nephrops fisheries take place in Functional units 16–19 (see Section 3.10.4). Catch per unit of effort has been stable and has fluctuated without trend over recent years. There is a TAC for all of Sub-area VII. There is an overview of *Nephrops* stocks in Section 2.1.1.

Other species taken in the area are herring, mackerel and blue whiting.

3.10.2 Demersal Stocks

Officially reported landings of cod, whiting, plaice and sole in Divisions VIIb,c, h-k are given in Tables 3.10.2.1-5.

Data are at present insufficient for assessment purposes.

3.10.3 Herring in Divisions VIa (South) and VIIb,c

Catch data (Table 3.10.3.1):

Year	Rec. TAC	Agreed TAC	Disc. slip.	ACFM catch
1987	18	17		48.6
1988	11-18	14		29.1
1989	15	20	1.0	29.2
1990	27/25	27.5	2.5	44.0
1991	<26	27.5	3.4	37.7
1992	29	28	0.1	31.9
1993	29	28	0.2	36.8
1994	28	28	0.7	33.9
1995	36	28		

¹ Average of recent years. Weights in '000 t.

Historical development of the fishery: In recent years reported catches from this stock have been rather stable - having decreased from a maximum level in 1987. Most of the catches (>95%) are now taken by the Irish fleet which has developed an important roe fishery. The fishery in Division VIa (South) was closed in the late 1970s when that area was combined with Division VIa (North) for assessment and management.

State of stock: The state of the stock is not known. The stock in this area has been heavily dominated by the 1985 year class which recruited in 1988. In 1994 it still constituted over 15% of the catches in number.

Forecast for 1996: None carried out.

Management advice: If a precautionary TAC is required, ACFM advises that it should be set such that the resulting catches do not exceed the average of recent years.

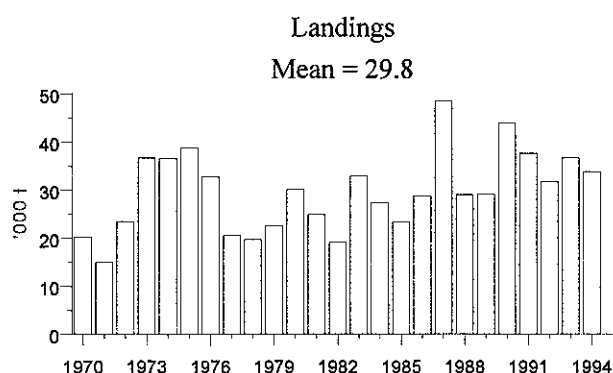
Special comments: Accurate information about catch location is required to clarify the extent of misreporting from Division VIa (S) to VIa(N).

Data and assessment: The quality of the catch data from this area appears to be reasonably good. Although considerable amounts of catch which are in fact taken in Division VIa (South) are reported as having been taken in Division VIa (North) it is possible to reallocate them using information from the fisheries.

The level of biological sampling is satisfactory in the fishery and good coverage of the catches has been maintained. Fishery-independent data are insufficient for calibration of an analytical assessment.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13).

(Details in Table 3.10.3.2)



3.10.4 *Nephrops* in Divisions VIIb,c,j,k

Units included in recommended Management Area: a) Porcupine Bank (Unit 16), b) Aran Grounds (Unit 17), c) NW and W Ireland (Unit 18) and d) SW Ireland (Unit 19).

Catch data (Tables 3.10.4.1 - 3.10.4.2) :

Year	Rec TAC	Agreed TAC ¹	ACFM landings
1987			4.5
1988			3.9
1989			3.7
1990			2.9
1991	5.09		3.2
1992	3.8	20.0	3.5
1993	~4.0	20.0	3.4
1994	~4.0	20.0	2.9
1995	~4.0	20.0	

(Weights in '000 t) ¹Sub-area VII

Historical Development of the Fishery: Total landings increased to a peak in the early 1980s, and have decreased since. At Porcupine Bank the 1994 landings have remained at the recent low levels (graph a).

State of stock: a) Porcupine Bank: CPUE (Spanish fleet) has been slowly increasing since 1992 (graph c). LPUE (French fleet) fairly stable since 1989, with an increase in 1994. Effort has decreased substantially in the fleets involved

(graph b). The yield per recruit analysis carried out in 1993 suggested that current F is above F_{max} in males and close to F_{max} in females (graph e). Mean size is fairly stable in both males and females.

b) Aran Grounds: the assessment (1992) suggests that the current F is close to F_{max} in both males and females.

c) No assessments for other units.

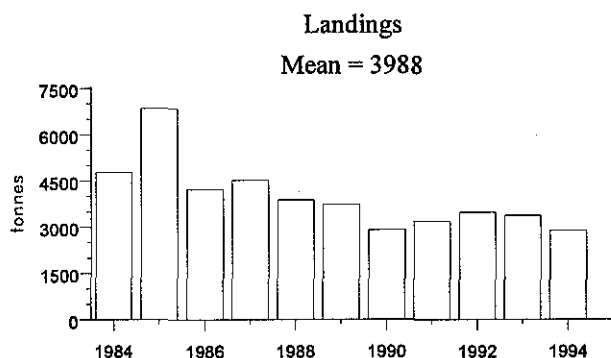
Management advice: ACFM advises a precautionary TAC of 4,000 t for 1996 and 1997.

Special comments: ACFM advised a precautionary TAC of about 4,000 t for the Management Area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. It should be noted that this Management Area includes four functional units and that a TAC set for the entire area will not necessarily result in balanced exploitation between the four units. At present this Management Area is within a much larger TAC area where the problem referred to will be even greater.

Data and assessment: CPUE, LPUE and mean size data were available for Porcupine Bank. A new yield per recruit assessment was not carried out this year. An age-based assessment was performed for Porcupine Bank (1993) but is considered still to be uncertain. Assessments were not possible this year for NW and W Ireland and SW Ireland.

Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area.
(Details in Table 3.10.4.3)



3.11 Stocks in the Iberian Region (Division VIIIc and Sub-areas IX and X)

3.11.1 Overview

The fisheries

The Iberian Region along the eastern Atlantic shelf is considered an upwelling area; this phenomenon takes place during late spring and summer due to the northerly wind and current system in the area. This region is characterized by a large number of commercial and non-commercial fish species.

The fisheries in the region are of a typical mixed nature. Different kinds of Spanish and Portuguese fleets operate in the Iberian Region: one is the mixed trawl fleet (single, pair and crustacean trawlers) fishing for species such as hake, blue whiting, horse mackerel, megrim, anglerfish, mackerel, *Nephrops*, bib and cephalopods as the main species. Other fleets fishing for different target species are longliners fishing for hake and mackerel, fixed nets used for hake, anglerfish and mackerel and purse seiners which target sardine and anchovy, and secondly mackerel and horse mackerel.

Many bottom trawlers are fishing in the southern part of Division IXa (Gulf of Cadiz); these trawlers are smaller than those operating in the northern parts of the Iberian Region. The composition of their catches is also different. They are fishing for hake as well as crustaceans and molluscs (Octopus etc.).

The number of trawlers has decreased since the early 1980s, resulting in a decreasing trend in the overall effort in the Portuguese and Spanish fleets. The fleets operating gillnets and long lines have also declined in number of boats in recent years. Spanish boats using trawl, longline or fixed nets are currently subjected to a restricted entry system.

Two stocks of anchovy are considered in the Iberian Region, one in Sub-area VIII and one in Division IXa. The Spanish and French fleets fishing for anchovy in Sub-area VIII are well separated geographically and in time (the Spanish fleet operates in Division VIIIc in spring and the French fleets in Division VIIIa in summer and autumn and in Division VIIIb in winter and summer). Changes in the catch age composition between the 1984–1994 period and the earlier years could be related to a higher dependence of catches on recruitment in recent years and a change in the seasonality in this fishery. The number of Spanish purse seiners for anchovy has remained stable since 1990 and a slight increase in the number of French purse seiners has been observed in the last five years. A sharp increase in fishing effort for anchovy in the Bay of Biscay has occurred since 1987 mainly due to the increased effort in the French pelagic trawl fleet.

The anchovy fishery in Division IXa is located in the Bay of Cadiz (Sub-division IXa South). Small quantities of anchovy are also caught in others parts of Division IXa.

In Divisions VIIIc (East) and VIIIb the target species for the purse seine fleet change with the season - anchovy in spring and tuna in the summer. This fleet changes gear and uses trolling and bait boats to catch tuna.

The catches of horse mackerel in Divisions VIIIc and IXa have been relatively stable over the last ten years. The proportion of landings by different gears has changed, i.e. trawl catches are decreasing while the purse seine catches are increasing.

Management measures

The fisheries in the Iberian Region are managed by a TAC system and technical measures. Common mesh sizes for trawls are 65 mm, except for trawlers fishing blue whiting or horse mackerel (40 mm). Other measures are a minimum landing size and seasonal closed areas to protect juvenile hake.

There has been observed a decrease in mean age in the anchovy catches since 1987; besides that the fishing effort is increasing. This fishery therefore needs to be managed. There are no management measures enforced in the sardine fishery except for a minimum landing size adopted as a technical measure at national level. With the present situation for this stock further management measures are needed. To improve management of these stocks recruitment surveys are needed.

State of stocks

The major data problems in the Iberian Region are the short time series of landing statistics, notably in the Gulf of Cadiz, little information about length composition for demersal species in the landings in that area, lack of routine estimates of discards (only available for Spanish waters in 1994). For most of the stocks the sampling level of the landings is considered adequate for assessment purposes, but the low level of samples of discards and particularly undersized hake is considered a problem. There are still some problems in consistency in age reading of hake and horse mackerel.

The Iberian Region is an important nursery ground for hake, sardine, horse mackerel, mackerel and blue whiting. Catches of fleets operating gears with low selectivity therefore contain significant quantities of juvenile fish.

The situation for hake is alarming. The landings and spawning stock biomass (SSB) reached a record low level in 1994. The recovery of SSB is unlikely at the current level of fishing mortality.

Information from the fisheries for the two species of anglerfish demonstrates a recent decline in landings and

CPUE indicating that the stock is currently at a very low level.

Catches of megrim *Lepidorhombus boscii*, which is the most abundant of the two species of megrim in the Iberian Region, have declined since 1989 and stabilized in the most recent years. In the last three years, SSB has been low and is predicted to remain at that level under current levels of fishing mortality. The state of the stock of *L. whiffiagonis* is unknown, but the recent decline in landings and CPUE indicates that the stock is at a very low level.

Two stocks of *Nephrops* are considered in Division VIIIc and five in Division IXa. For the overall management areas the landings are slightly decreasing in Division VIIIc while the catches fluctuate without a clear trend in Division IXa.

The fishing mortality is low and stable for this area.

Both catches and SSB of horse mackerel have been relatively stable over the last ten years. The sardine stock is considered to be outside safe biological limits. The SSB is considered to be low but it is not known how this relates to safe biological limits.

3.11.2 Hake - Southern stock (Divisions VIIIc and IXa)

Catch data (Table 3.11.2.1):

Year	Rec. TAC	Agreed TAC	ACFM Lndgs.	ACFM catch
1987	15.0	25.0	15.2	15.2
1988	15.0	25.0	15.4	15.4
1989	15.0	20.0	12.9	12.9
1990	15.0	20.0	12.0	12.0
1991	10.0	18.0	11.6	11.6
1992	10.3 ¹	16.0	12.8	12.8
1993	1.0 ²	12.0	10.9	10.9
1994	2.0 ³	11.5	9.5	9.5
1995	- ⁴	8.5		

¹Precautionary. ²Maximum catch that will allow SSB to rebuild to 20,000 t within 3 years. ³Maximum catch that will allow SSB to rebuild to the level of 1986-1988. ⁴Lowest possible level. Weights in '000 t.

Historical development of the fishery: This stock is caught in a mixed fishery by Spanish and Portuguese fleets using trawls, gillnets and longlines. In order to protect juvenile fish fishing is prohibited in some areas during part of the year. Landings have declined since 1983 reaching their lowest level in 1994. Agreed TAC's have consistently exceeded the actual landings.

State of stock: The stock is outside safe biological limits. SSB decreased very sharply between 1984 and 1986 and is at its lowest recorded level in 1994. Recruitment has steadily declined since 1982 and has been poor since 1989, but an increase was observed in 1993. Fishing mortality in 1994 is close to F_{high} (0.28).

Further details in Table 3.11.2.2.

Forecast for 1996:

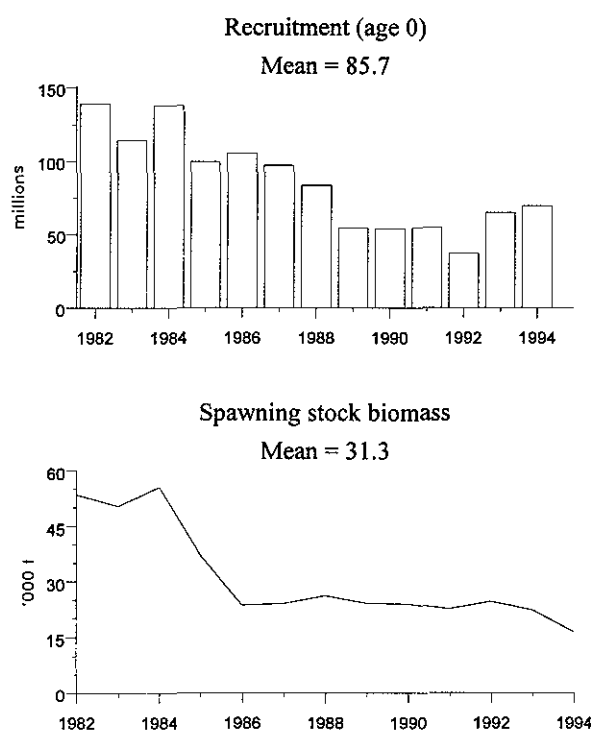
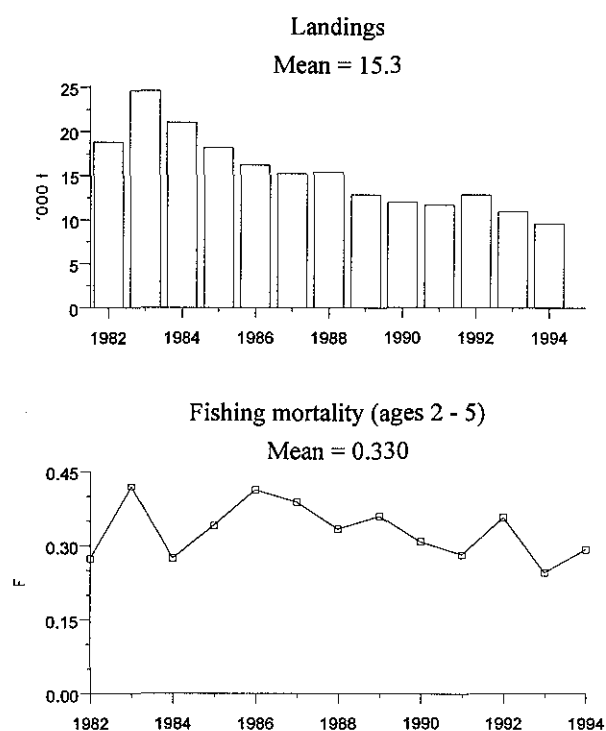
SSB(95) = 15.1 , $F(95) = 0.29$, Basis: $F(95) = F(94)$,
Catch(95) = , Landings (95) = 8.5

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4 F_{94}	0.12	13.9		3.8	16.8
B	0.6 F_{94}	0.18			5.4	15.5
C	0.8 F_{94}	0.23			7.0	14.3
D	1.0 F_{94}	0.29			8.4	13.2
E	1.2 F_{94}	0.35			9.8	12.2

Weights in '000 t.

All catch options result in SSB remaining close to the lowest observed levels. However, a reduction in F of more than 40% is expected to stabilise the SSB.

Management advice: ACFM recommends that fishing mortality in 1996 should be kept at the lowest possible level to give the SSB the greatest chance of recovery.



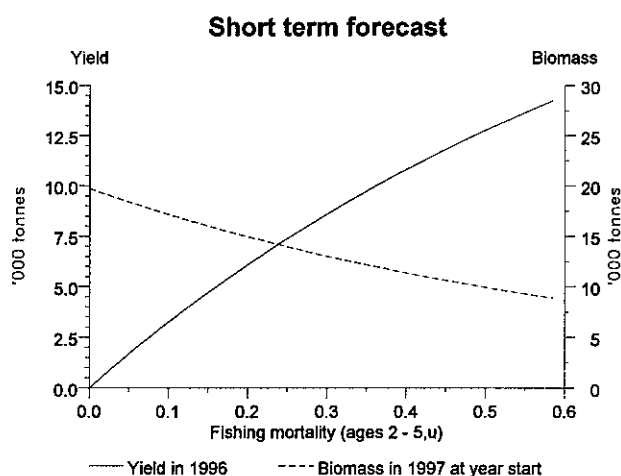
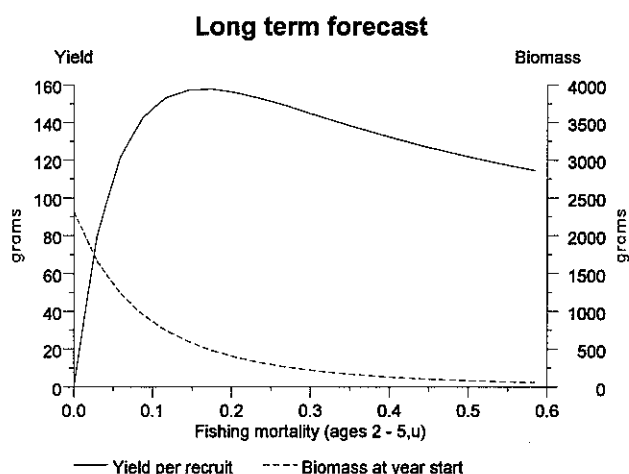
Special comments: Seen in isolation, fishing mortality on hake should be reduced to zero in order to bring about a recovery in spawning stock biomass. Hake are taken as part of a mixed trawl fishery. For this reason, any management action with regard to this stock will have consequences on other species. TACs have consistently been set at levels which cannot constrain the exploitation rate.

Data and assessment: Catch-at-age data derived from conversion of length to age compositions. Analytical

assessment using CPUE data from 3 commercial fleets and 2 surveys. Spanish discards were sampled in 1994, but have little effect if included in the assessment. Short-term predictions are not sensitive to the year class strength. Difficulties in sampling undersized fish (<27 cm) since 1989.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess: 5).

Yield and Spawning Stock Biomass



3.11.3 Megrim in Divisions VIIIc and IXa

3.11.3.a Megrim (*L. boscii*) in Divisions VIIIc and IXa

Catch data (Tables 3.11.3.a.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM Indgs.
1987	-	13.0	1.69
1988	-	13.0	2.22
1989	-	13.0	2.63
1990	-	13.0	1.95
1991	-	14.3	1.68
1992	-	14.3	1.92
1993	-	8.0	1.38
1994	-	6.0	1.40
1995	-	6.0	

¹Including *L. whiffiagonis*. Weights in '000 t.

Historical development of the fishery: This species is generally taken as a by-catch in mixed fisheries by Portuguese and Spanish trawlers, and accounts for about 80% of combined megrim landings. Both species (*Lepidorhombus*

boscii and *L. whiffiagonis*) are subject to a common TAC which considerably exceeds the landings.

State of stock: The time series is too short to determine whether the stock is inside or outside safe biological limits. SSB shows no major change over the period of the assessment. Recruitment appears to be very low for the 1993 year class.

Further details in Table 3.11.3.a.2.

Forecast for 1996:

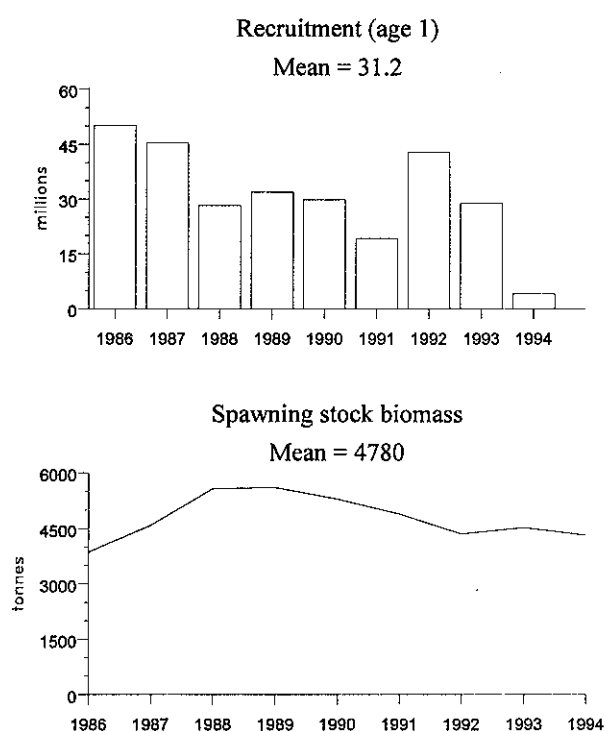
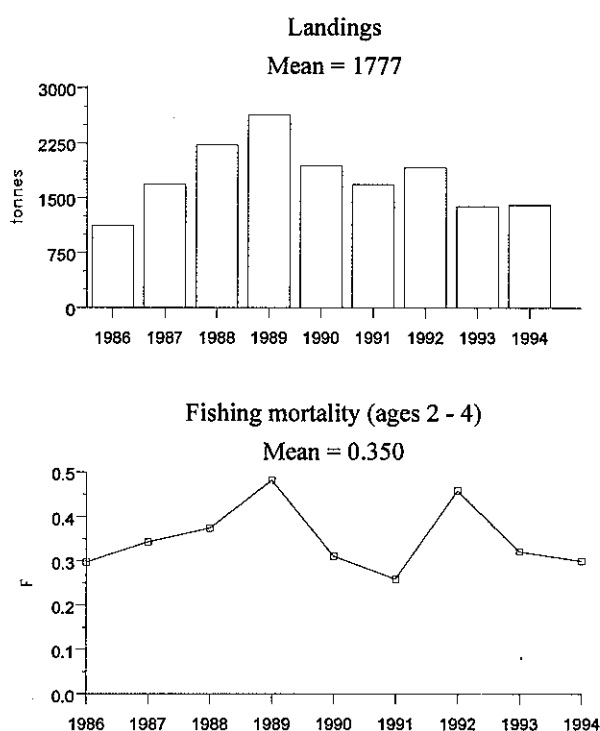
SSB(95) = 4.8, F(95) = 0.30, Basis: F(95)=F(94), Catch(95) = , Landings (95) = 1.65.

Recruitment of the 1994 and subsequent year classes set equal to the geometric mean for the period 1986-1992.

Option	Basis	F (96)	SSB (96)	Catch (96)	Indgs (96)	SSB (97)
A	0.4F ₉₄	0.12	4.66		0.70	5.68
B	0.6F ₉₄	0.18			1.01	5.34
C	0.8F ₉₄	0.24			1.29	5.04
D	1.0F ₉₄	0.30			1.55	4.76
E	1.2F ₉₄	0.36			1.79	4.51

Weights in '000 t.

Continued fishing at current levels will lead to a SSB at the level of the last three years.



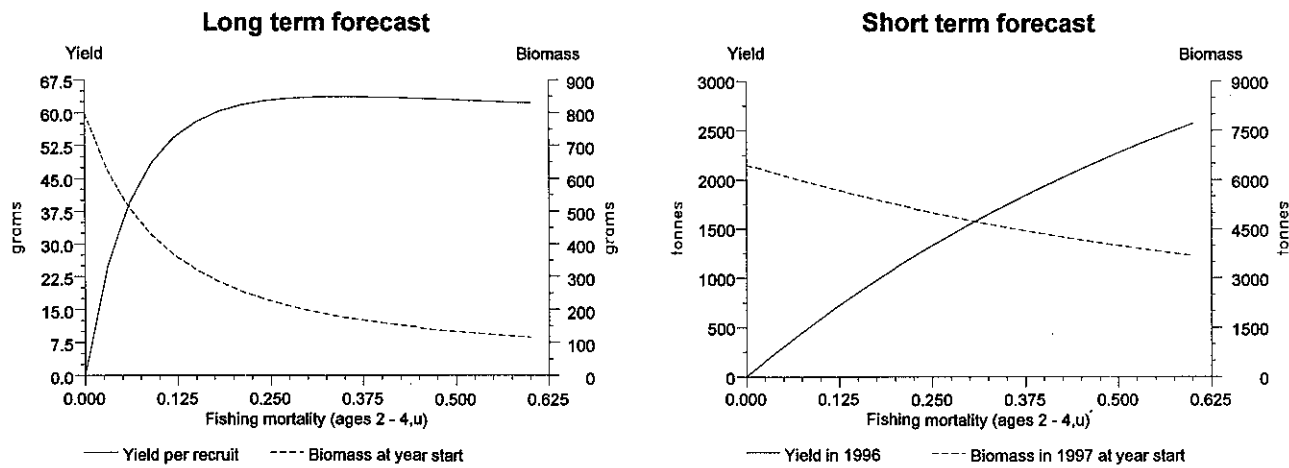
Management advice: Management should take into account the fact that *L. boscii* is caught in fisheries which are principally directed at hake , *Nephrops* and anglerfish.

Special comments: This year's assessment indicates that there is little danger of the SSB falling outside the observed range. The assessment is, however, considered to be uncertain.

Data and assessment: Age-based analytical assessment using CPUE data from two commercial fleets and one survey. No landings data are available for this stock before 1986.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5).

Yield and Spawning Stock Biomass



3.11.3.b Megrim (*L.*) in Divisions VIIIc and IXa

Catch data (Table 3.11.3.b.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM Indgs.
1987	-	13.0	0.50
1988	-	13.0	0.82
1989	-	13.0	0.71
1990	-	13.0	0.98
1991	-	14.3	0.61
1992	-	14.3	0.52
1993	-	8.0	0.38
1994	-	6.0	0.48
1995	-	6.0	

¹Including *L. boscii*. Weights in '000 tonnes.

Historical development of the fishery: This species is generally taken as a by-catch in mixed trawl fisheries by Portuguese and Spanish fleets, and accounts for about 20% of

combined megrim landings. Both species (*Lepidorhombus whiffiagonis* and *L. boscii*) are subject to a common TAC which considerably exceeds the landings.

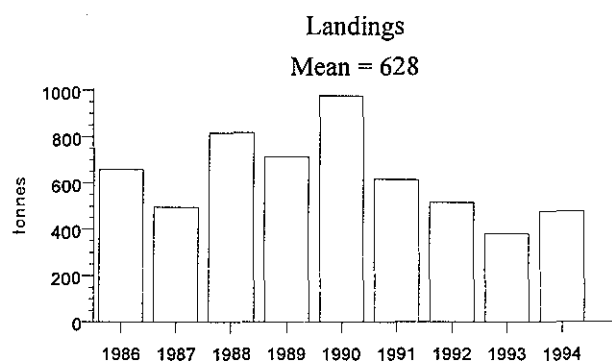
State of stock: The recent decline in landings and commercial CPUE indicates that the stock is currently at a low level.

Management advice: Management should take into account the fact that *L. whiffiagonis* is caught in fisheries which are principally directed at hake, *Nephrops* and anglerfish.

Special comments: TACs affecting this stock include both species of megrim and have been well above actual catches in recent years. The assessment this year proved very sensitive to arbitrary assumptions necessary to run the analysis. In view of this sensitivity, the assessment was not regarded as reliable.

Data and assessment: Analytical assessment attempted but not accepted by ACFM. There are no landings data prior to 1986.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Species, September 1995 (C.M.1996/Assess:5).



3.11.4 Anglerfish in Divisions VIIIc and IXa (*L. piscatorius* and *L. budegassa*)

Catch data (Tables 3.11.4.1-2):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch ¹	Catch of <i>L. piscat.</i>	Catch of <i>L. budeg.</i>
1987	-	12.0	8.9	5.1	3.8
1988	-	12.0	10.0	6.3	3.7
1989	-	12.0	7.6	5.0	2.6
1990	-	12.0	6.1	3.8	2.3
1991	-	12.0	5.8	3.6	2.2
1992	-	12.0	5.5	3.4	2.1
1993	-	13.0	4.5	2.3	2.2
1994	-	13.0	3.6	2.0	1.6
1995	- ²	13.0			

¹For both species combined. ²Precautionary TAC. Weights in '000 t.

Historical development of the fishery: Both species are caught in mixed fisheries by Portuguese and Spanish fleets. In the early 1970s, commercial interest for these species increased and a directed artisanal fishery developed in Spain, originally targeting large fish. In recent years, anglerfish have comprised around 2.5% of the total catches of both the Spanish trawl fleet and Portuguese artisanal fleet (mainly from gill nets), 2.0% of the Portuguese fish trawl fleet's landings, and 13.4% of the total catch of the Portuguese crustacean trawl fleet.

TACs have been well above actual catches in recent years.

Lophius piscatorius

State of stock: The recent decline in landings and commercial CPUE indicates that the stock is currently at a very low level.

Management advice: If a TAC is to be implemented for this stock, a precautionary TAC should be set on the basis of recent catch levels. TACs have been well above actual catches in recent years.

Data and assessment: No reliable analytical assessment available.

Lophius budegassa

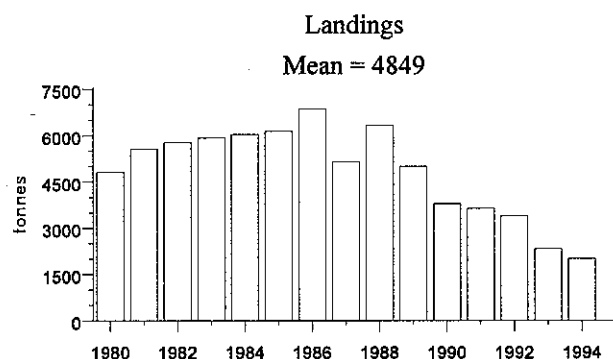
State of stock: The recent decline in landings and commercial CPUE indicates that the stock is currently at a very low level.

Management advice: If a TAC is to be implemented for this stock, a precautionary TAC should be set on the basis of recent catch levels. TACs have been well above actual catches in recent years.

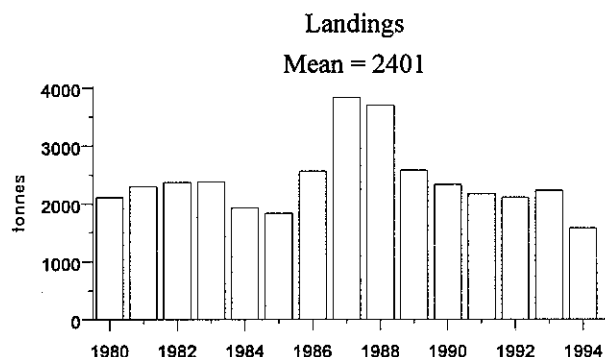
Data and assessment: No reliable analytical assessment available.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess: 5).

L. piscatorius



L. budegassa



3.11.5 Mackerel in Divisions VIIIc and IXa (Southern component)

Evaluation of this component is given in Section 3.12.3 dealing with the combined mackerel assessment.

3.11.6 Southern horse mackerel (Divisions VIIIc and IXa)

Catch data (Tables 3.11.6.1-5):

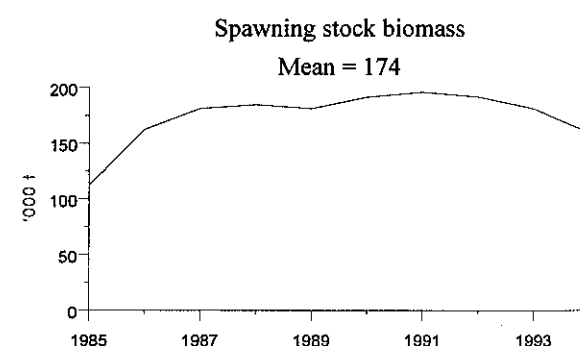
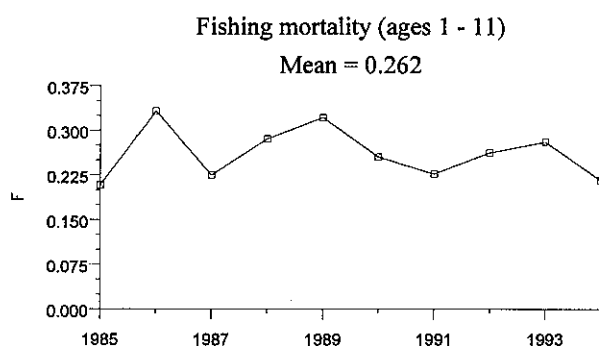
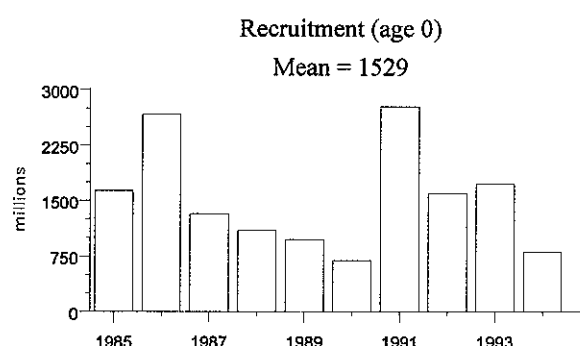
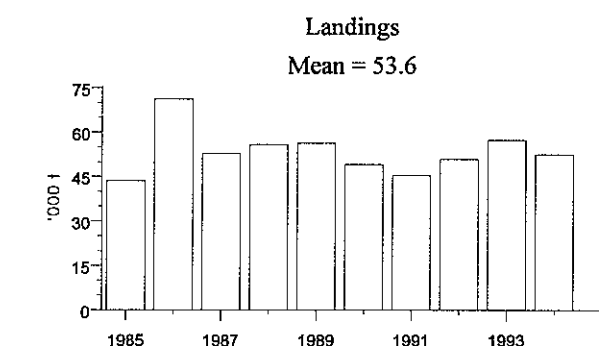
Year	Rec. TAC ¹	Agreed TAC ¹	ACFM catch ²
1987	-	72.5 ³	55
1988	-	82.0 ³	56
1989	-	73.0 ³	56
1990	38	55.0 ⁴	49
1991	61	73.0 ⁴	46
1992	61 ⁵	73.0 ⁴	51
1993	-	73.0 ⁴	57
1994	55 ⁶	73.0 ⁴	53
1995	63 ⁶	73.0 ⁴	

¹Includes all *Trachurus* spp. ²Includes only *Trachurus trachurus* L. ³Division VIIIc, Sub-areas IX and X, and CECAF Division 34.1.1 (EC waters only). ⁴Division VIIIc and Sub-area IX. ⁵Precautionary TAC. ⁶Catch at *status quo* F.applies only to *Trachurus trachurus* L. Weights in '000 t.

Historical development of the fishery: The level of the catches has been stable since 1987. Purse seiners and trawlers harvest more than 90 % of the catches. There are annual changes in the proportion of the catches by gear type. In general the major catches of horse mackerel occur during the second and third quarters. The catch data have been revised since 1981 to correspond only to those of *Trachurus trachurus*.

State of stock: With this short time series it is difficult to determine the state of the stock in relation to safe biological limits. The SSB is estimated to have been between 112,000-196,000 t in the last ten years and is currently estimated to be 190,000 t.

Details in Table 3.11.6.6.



Forecast for 1996: Forecast for 1996 based on geometric mean 0-group recruitment of 1,442 million fish.

SSB(95) = 190, $F(95) = 0.2162$, Basis: $F(95): F(94)$,
Catch(95) = 64, Landings (95) = 64

Option	Basis	F (96)	SSB (96)	Catch (96)	SSB (97)
A	0.4 F_{94}	0.087	211	25	250
B	0.6 F_{94}	0.130	210	36	239
C	0.8 F_{94}	0.173	208	47	228
D	1.0 F_{94}	0.216	206	58	218
E	1.2 F_{94}	0.260	204	68	209

Weights in '000 t.

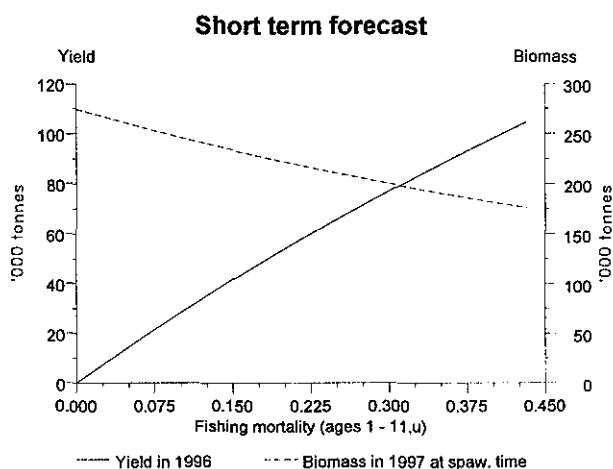
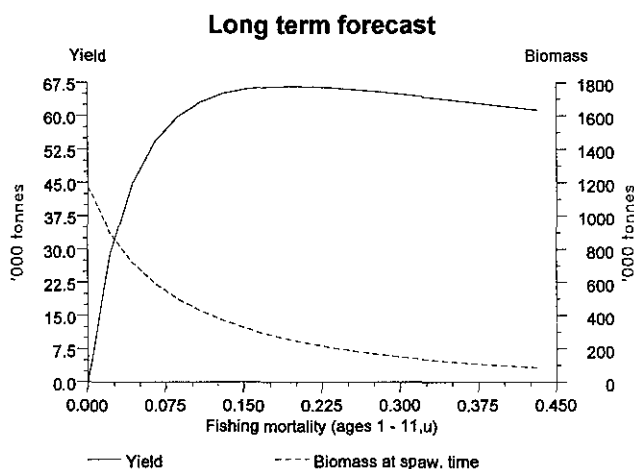
The spawning stock will increase for all the options given.

Management advice: ACFM noted that no long-term gain in yield is expected by increasing the current fishing mortality.

Data and assessment: Catch at age data for both Spain and Portugal are available from 1985 onwards. Two CPUE series from commercial Spanish catches starting in 1983 and fishery-independent information derived from trawl surveys were used for tuning the assessment.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M.1996/Assess:7).

Yield and Spawning Stock Biomass



3.11.7 Sardine in Divisions VIIIc and IXa

Catch data (Table 3.11.7.1):

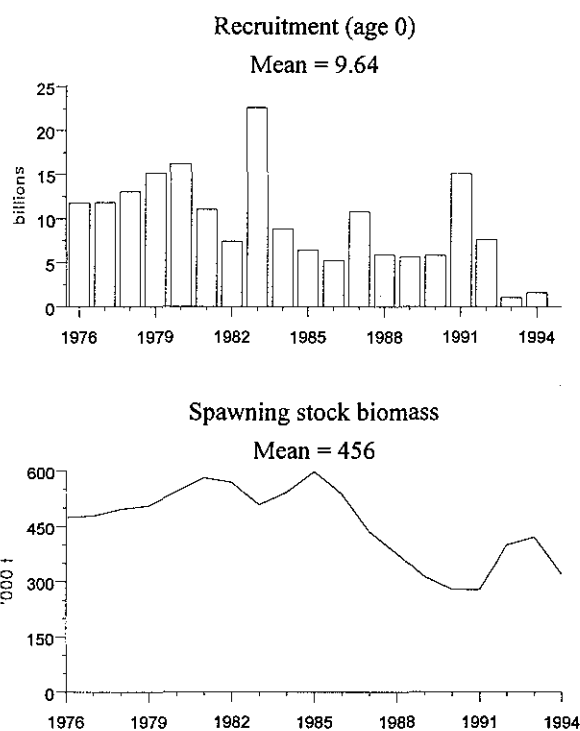
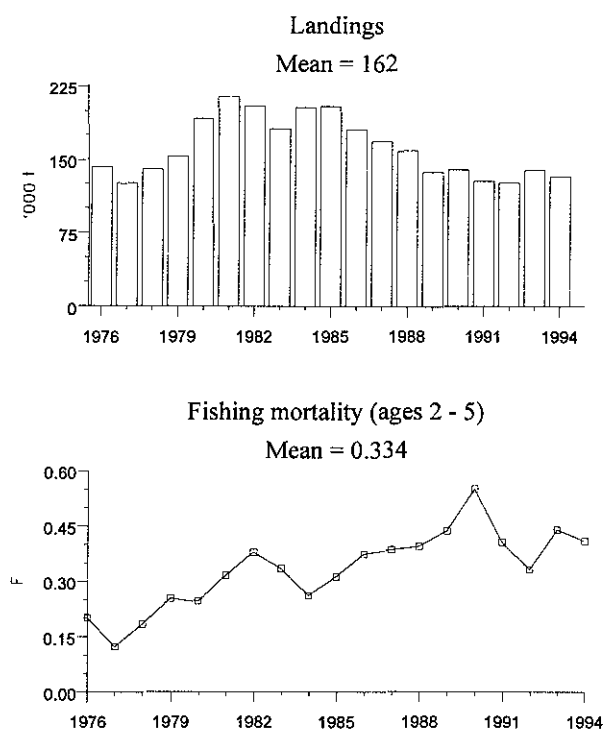
Year	Rec. TAC	Agreed TAC	ACFM catch
1987	140	-	169
1988	150	-	159
1989	212	-	137
1990	-	-	139
1991	176	-	128
1992	-	-	126
1993	135 ¹	-	139
1994	118 ²	-	133
1995		-	

¹Precautionary. ²Estimated catch at *Status quo* F. ³Lowest possible level. Weights in '000 t.

Historical development of the fishery: All the available catch data, from 1940 to 1994 (Figure 3.11.7.1), show three periods of decreasing trend (1944 -1949, 1961-1977 and 1981-1994). The highest landings occurred in 1961 (250,000 t) and the lowest in 1949 (67,000 t). The stock is mainly fished in Division IXa by two countries, Portugal and Spain. The trends in the catches of both countries are similar. Nevertheless, after a period of high catches from 1980 to 1985, the Spanish catches show a decreasing trend since 1987, whereas the Portuguese catches have remained quite stable (100,000 t per year) (Figure 3.11.7.2). The sardine is a target species for the Portuguese and Spanish purse-seine fleets. The highest catches occur in the second half of the year (68% of the annual catch).

State of stock: The stock is considered to be outside safe biological limits. The SSB in 1995 is estimated as the lowest on record. After 1992 all year classes appear to be low.

Details in Table 3.11.7.2.



Forecast for 1996: Forecast for 1996 based on average recruitment from 1995 and onwards.

SSB(95)=220 F(95)=0.4098, Basis: F(95): F(94); Catch (95)=94, Landings(95)=94

Option	Basis	F (96)	SSB (96)	Catch (96)	Landings (96)	SSB (97)
A	0.2 F ₉₄	0.082	147	15	15	200
B	0.4 F ₉₄	0.164	144	30	30	187
C	0.6 F ₉₄	0.246	141	43	43	175
D	0.8 F ₉₄	0.328	138	55	55	164
E	1.0 F ₉₄	0.410	135	67	67	154
F	1.2 F ₉₄	0.492	133	77	77	145

Weights in '000 t.

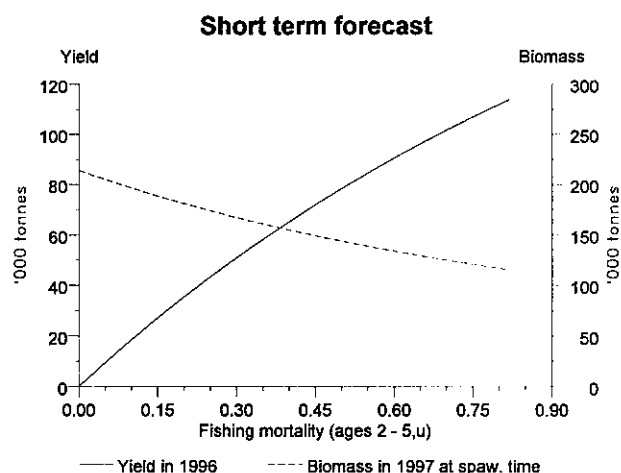
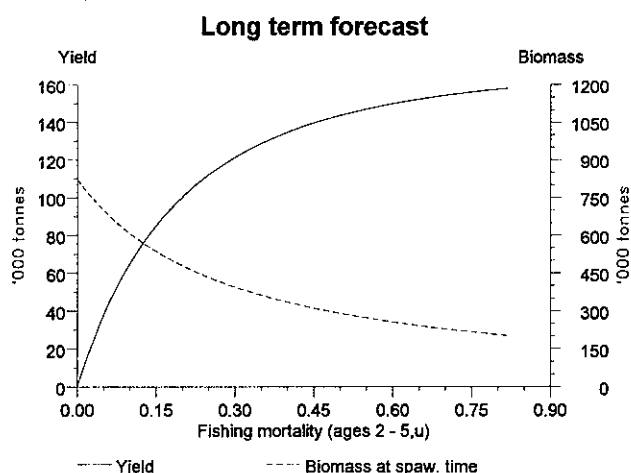
For all options the SSB will decrease from the 1995 level.

Management advice: To prevent a further decline in SSB, ACFM recommends that the catches in 1996 should be reduced to the lowest possible level.

Data and assessment: Catch-at-age data for ages 0 to 6+ are available for this fishery from 1976 to 1994.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M.1996/Assess:7).

Yield and Spawning Stock Biomass



3.11.8 Anchovy

3.11.8.a Anchovy in Sub-area VIII (Bay of Biscay)

Catch data (Table 3.11.8.a.1 and Figure 3.11.8.a.1) :

Year	Rec. TAC	Agreed TAC	Official landings	ACFM catch
1987	-	32	14	15
1988	- ¹	32	14	15
1989	-	32	n/a	10
1990	12.3	30	n/a	34
1991	14.0	30	n/a	19
1992	-	30	n/a	38
1993	-	30	n/a	40
1994	-	30	n/a	35
1995	-	33		

¹Not greater than the 1985-1987 level. Weights in '000 t.

Historical development of the fishery (Figure 3.11.8.a.1):

The fishery developed during the forties and fifties with the modernisation and increase of units of the Spanish purse seine fleet. The maximum catches and number of vessels was reached in the sixties, but afterwards, due to a sharp decrease in catches, this fleet was largely reduced up to the eighties. Since 1985, the French fleet of midwater trawlers involved in the anchovy fishery has increased continuously. In 1994, the number of pelagic trawlers was more than the half of the number of Spanish purse seiners. During the last 5 years, the number of vessels in the French pelagic fleet fishing for anchovy has doubled and at the same time their catches have reached the same level as the Spanish ones. These general observations indicate a sharp increase in fishing effort on anchovy in the Bay of Biscay since 1987, despite some decrease in the number of Spanish purse seiners. Nowadays, the level of effort on anchovy has probably increased to the level that existed at the beginning of the seventies.

State of stock: The state of the stock is uncertain in relation to the safe biological level. The stock is likely to fluctuate widely due to the large variations in recruitment. The low catches in the 1980s and the change in the exploitation pattern towards age 1 indicate a relatively low spawning stock biomass in recent years.

Management advice: Reduced fishing mortality on juvenile anchovy will increase the spawning biomass without major loss in total yield. This may be achieved by closing the fishing areas with high abundance of 1-group anchovy. To this end, ACFM reiterates its advice that fishing for anchovy could be prohibited between January and June inclusive within the area defined by the following boundaries:

- from the Spanish coast north along longitude 1°35'W to latitude 44°45'N
- west to longitude 1°45'W
- north to latitude 46°00'W
- and east to the French mainland.

Special comments : The increase in effort in recent years has led the catches to levels higher than the historical average catches recorded for this fishery. Therefore, caution should be paid to the continuous increase of effort, because it is likely that catches could be exceeding the average surplus production of the stock. In this sense effective management of this fishery is required.

Advice on the levels of catches for a given year cannot be provided a year in advance because the catches of this short-lived species largely depend on the onset of recruitment produced each year. Management of catch level therefore has to be implemented every year as soon as an estimate of the incoming recruitment is available from a direct estimate of the population. For this purpose, routine monitoring of the population by direct methods has to be implemented and management decisions have to be made as soon as the scientific advice becomes available from the surveys. Acoustic surveys during late autumn or at the beginning of the year could be undertaken to assess recruitment every year. An egg survey in May could be carried out to confirm or revise the biomass estimated by the acoustic survey. An *ad hoc* scientific committee could meet after the surveys to formulate scientific advice on the level of catches for the current year. This advice could be sent to managers but should be evaluated by ACFM.

Data and assessment: Catch-at-age and catch-at-length data from French and Spanish fisheries. Stock biomass estimates from egg and acoustic surveys, both of which were ended in 1992. In 1994, egg surveys were again carried out. Analytical assessment of catch at age and survey data was attempted but was considered to be unreliable.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M.1996/Assess:7).

3.11.8.b Anchovy in Division IXa

Catch data (Table 3.11.8.b.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987	-	4.6	n/a
1988	-	6	4.7
1989	-	6	6.2
1990	-	9	6.5
1991	-	9	5.9
1992	-	12	3.2
1993	-	12	2.0
1994	-	12	3.4
1995	- ²	12	

¹TAC for Sub-areas IX and X and CECAF 34.1.1.

²Precautionary TAC at level of recent catches. Weights in '000 t.

Historical development of the fishery: In Division IXa anchovy is only a target species for Spain in Sub-division IXa South. Anchovy is taken as by-catch in the Portuguese sardine fishery in Division IXa.

The Spanish catch in Sub-Division IXa South made up about 93% of the total catch during the period 1988-1993. For 1943-1987 data are available for Portugal only, and for this country catches ranged from 88 t to 12,610 t. The catches increased in 1994 and especially in 1995 (preliminary data for the first half of the year given in Table 3.11.8.b.1) in all areas, mainly in Sub-Division IXa North (Galician waters) and Subdivision IXa Central-North (Portuguese waters).

State of stock: Unknown.

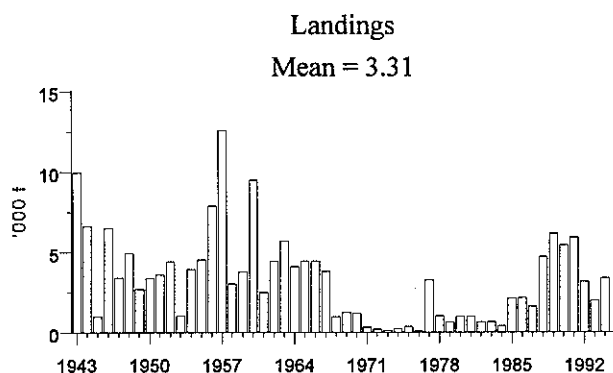
Forecast for 1995: Not available.

Management advice: If a TAC is to be set for 1996, a precautionary TAC at the level of recent catches is appropriate.

Data and assessment: No assessment because of insufficient data.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M. 1996/Assess: 7).

Landings 1943-1987 only for Portugal; 1988-1994 for Portugal and Spain.



3.11.9.a *Nephrops* in Division VIIIc

Units included in recommended Management Area: a) North Galicia (Unit 25) and b) Cantabrian Sea (Unit 31).

Catch data (Tables 3.11.9 a.1 - 3.11.9 a.2) :

Year	Rec TAC	Agreed TAC	ACFM landings
1987		0.5	0.53
1988		0.5	0.60
1989		0.6	0.52
1990		0.8	0.46
1991	0.51	0.6	0.56
1992	~0.51	0.8	0.52
1993	0.51	1.0	0.37
1994	0.51	1.0	0.39
1995	0.51	1.0	

(Weights in '000 t)

Historical Development of the Fishery: Landings and effort have declined since the 1970s in the North Galicia fishery, and are at present close to record low values (graphs a and b). The Cantabrian Sea fishery has been fluctuating (graph f). For the whole area the 1993 landings are among the lowest in the time series.

State of stock: a) North Galicia: CPUE levelled off in 1994, but overall trend downwards (graph c). Mean size of males and females fluctuating without obvious trend (graph d). Effort fluctuating since 1986 following a period of decline (graph b).

Yield-per-recruit analysis suggests that current F is above F_{max} in males, although long-term gains in moving to F_{max} are less than 5%; in females current F is below F_{max} (graph e).

b) Cantabrian Sea: CPUE slowly decreasing below the level of the period 1987-1990 (graph h), while effort is decreasing (graph g). Mean size of both males and females increasing (graph i). Yield-per-recruit analysis (1991) suggested that current F was above F_{max} in males and below F_{max} in females (graph j).

Both stocks are considered to be fully exploited.

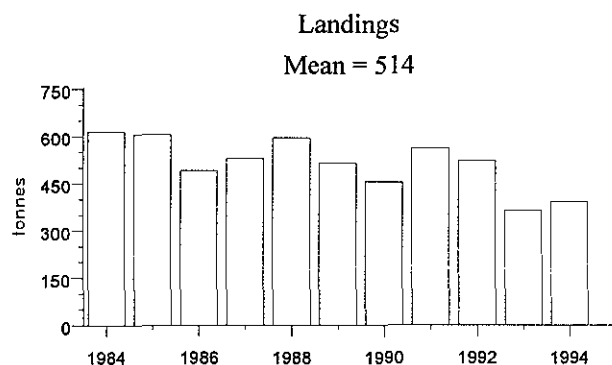
Management advice: ACFM advises a precautionary TAC of 510 t in 1996 and 1997.

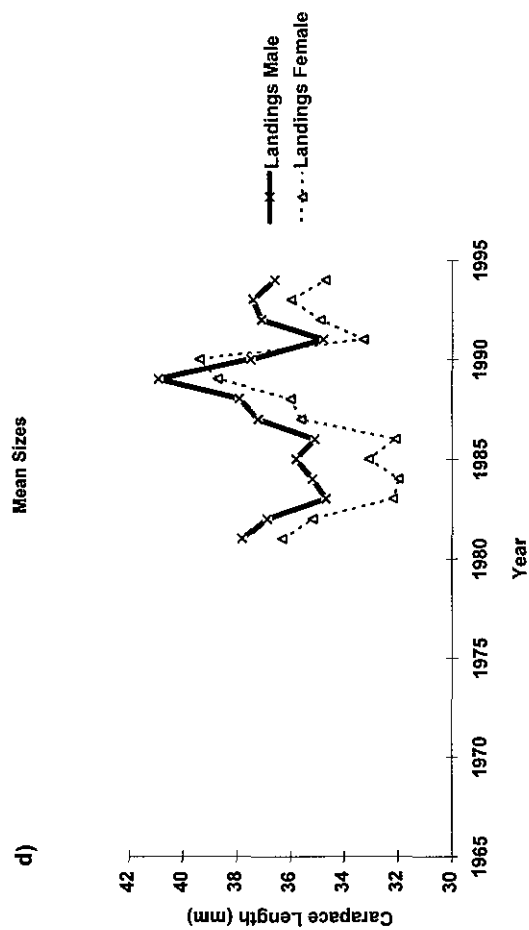
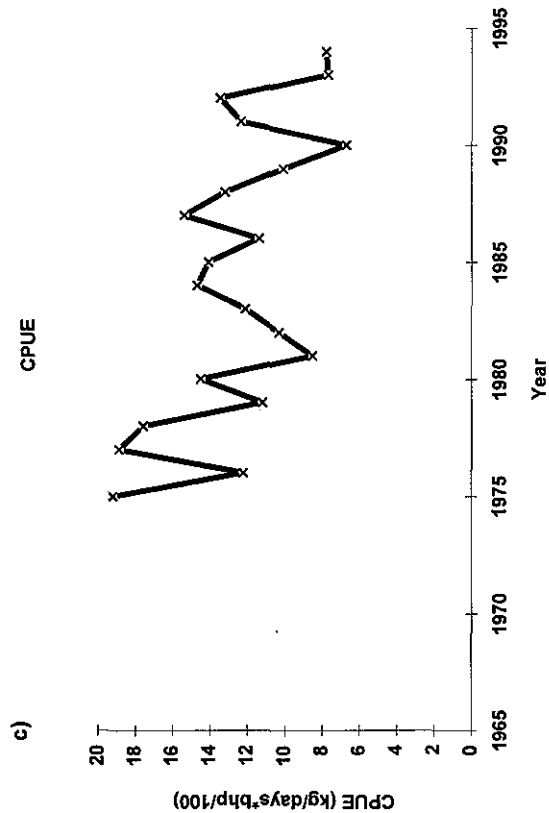
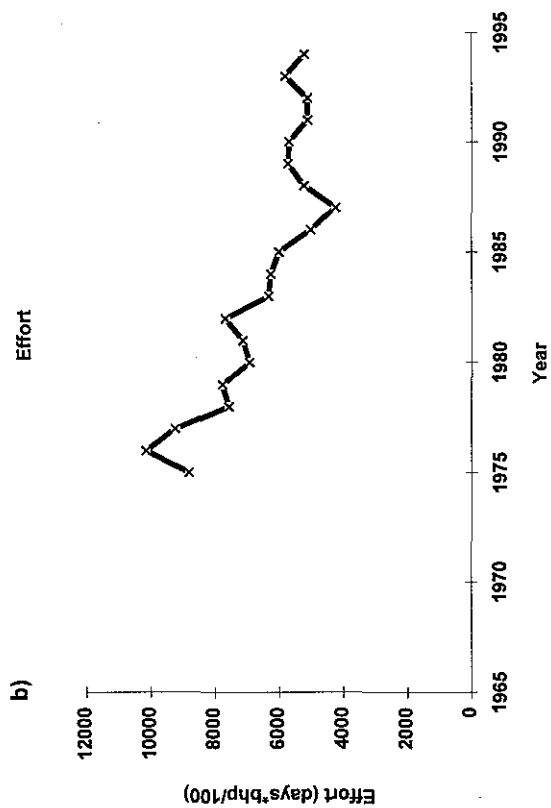
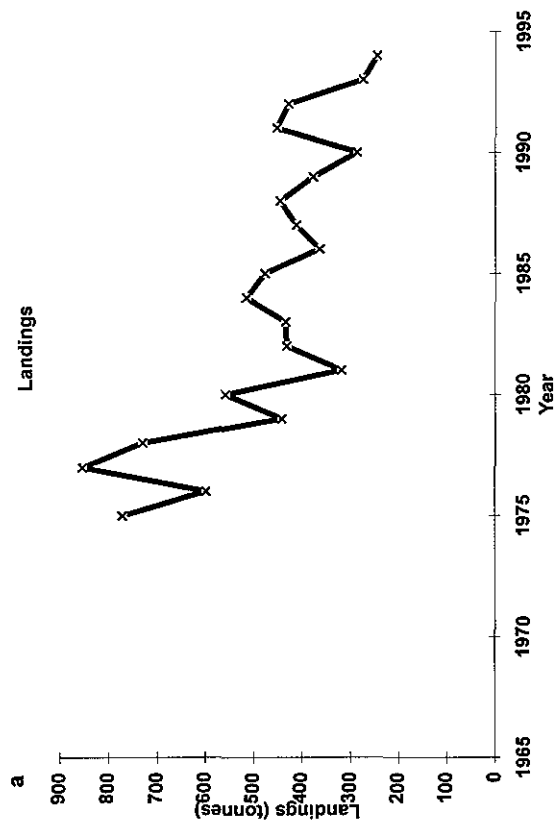
Special comments: ACFM advised a precautionary TAC of 510 t for the Management Area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. It should be noted that this recommended Management Area includes two functional units and that a TAC set for the entire area will not necessarily result in balanced exploitation between the two units.

Data and assessment: CPUE and mean size data available for both units. a) North Galicia: Yield per recruit length-based and age-based VPA analysis (1995). b) Cantabrian Sea: Length-based assessment performed in 1991 but not regarded as reliable.

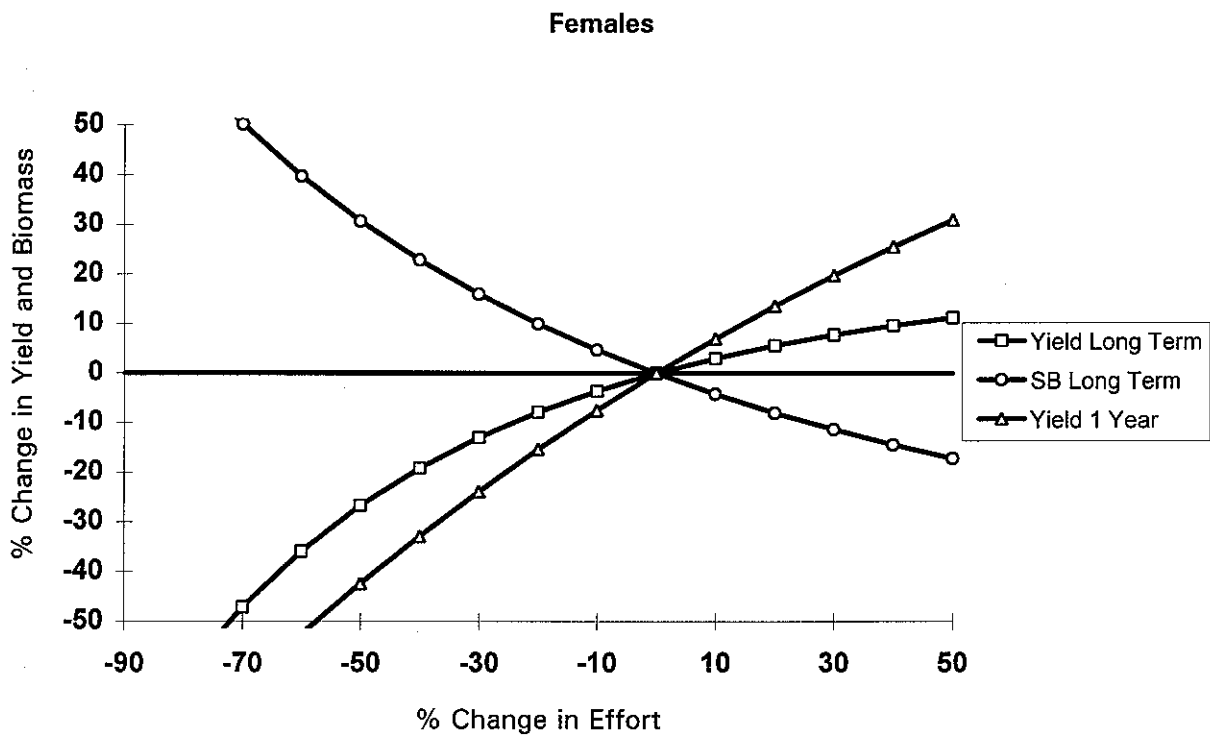
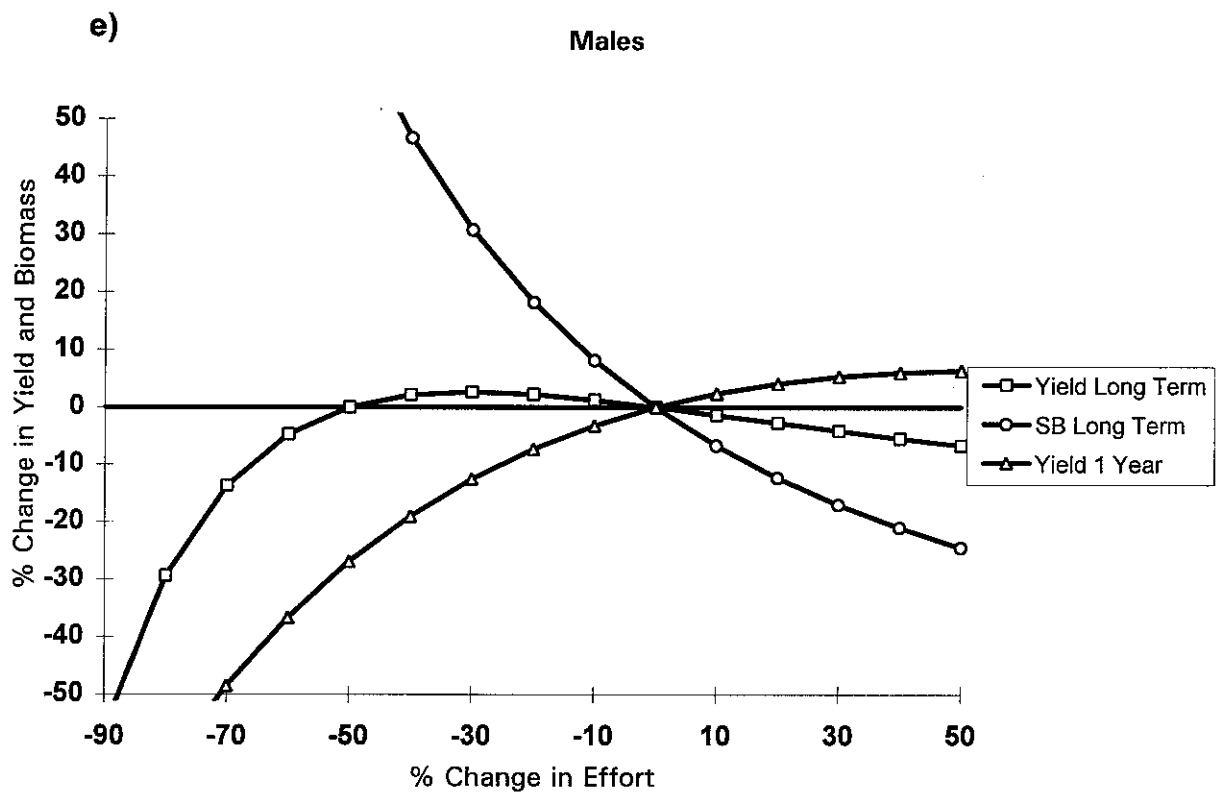
Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area
(Details in Table 3.11.9 a.3).

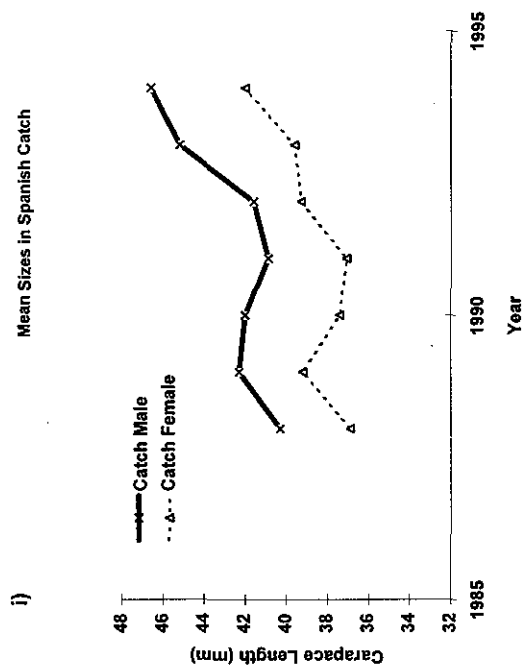
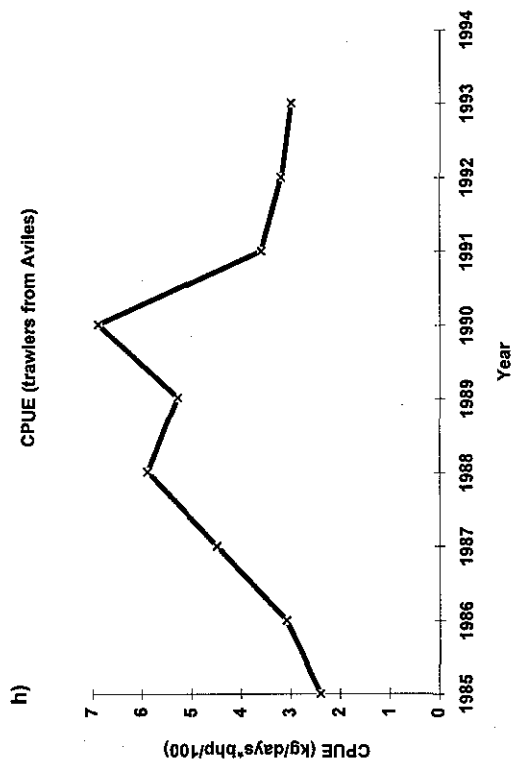
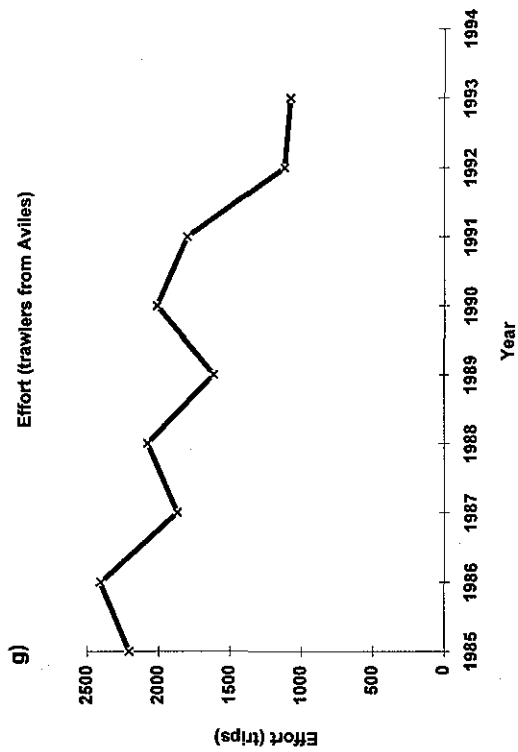
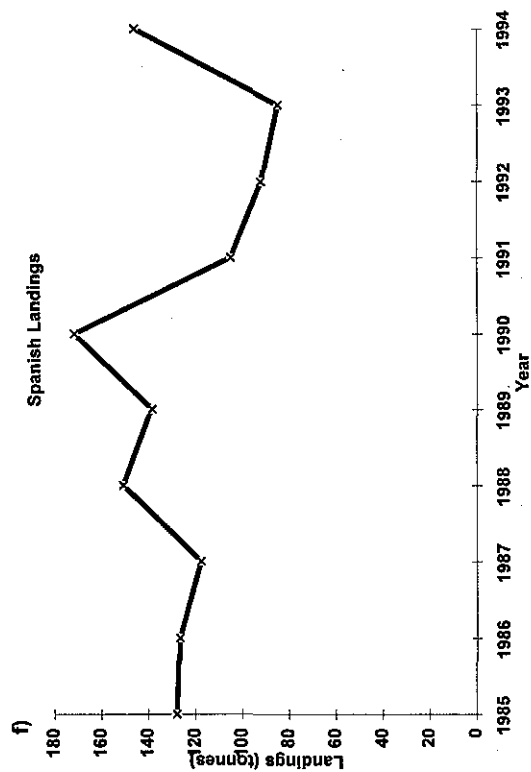




North Galicia (FU 25.) Long-term trends in Spanish landings (tonnes), effort (days*bhp/100), CPUE (kg/days*bhp/100) and mean sizes (mm CL) in landings.

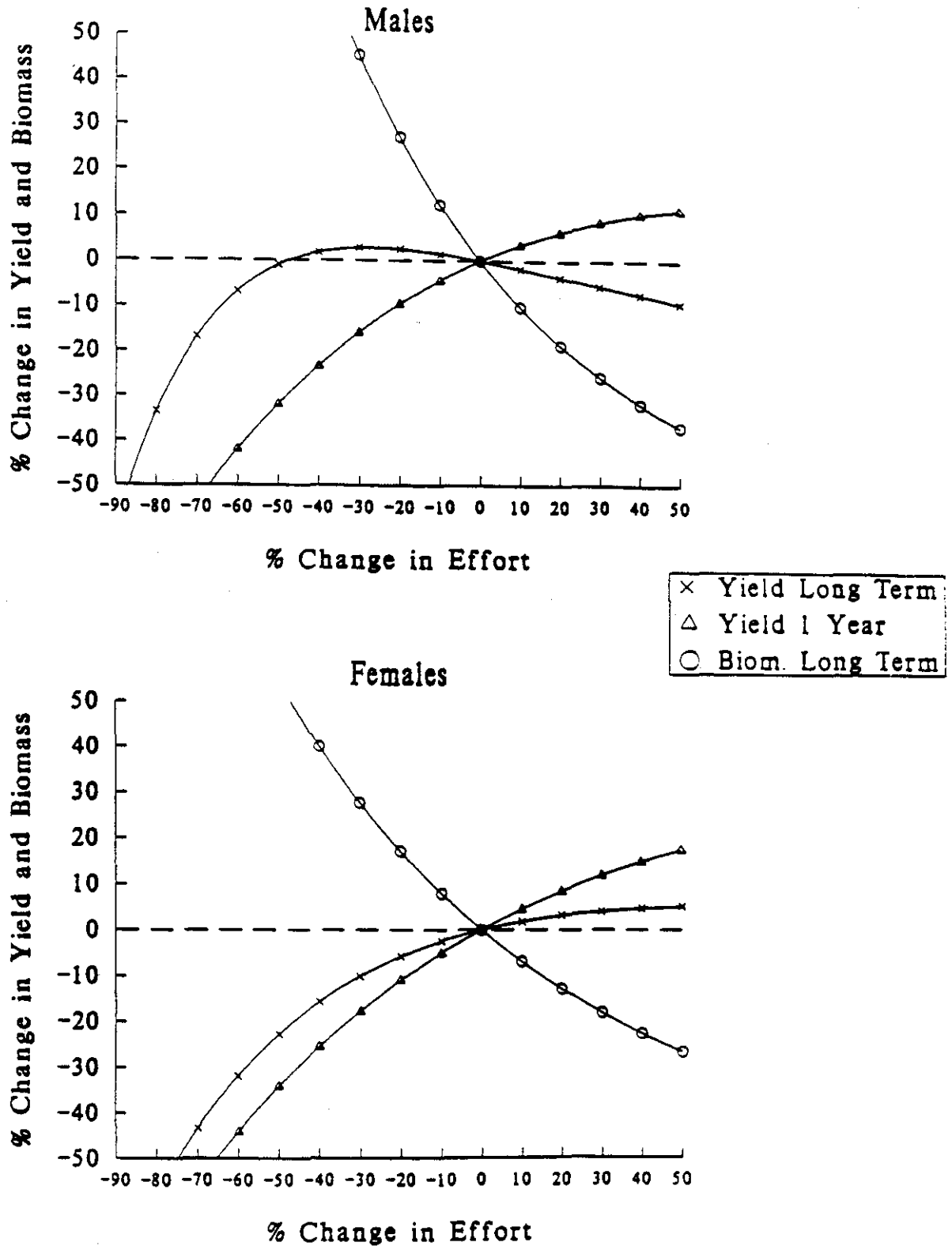


North Galicia (FU 25): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Males and females shown separately.



Cantabrian Sea (FU 31): Long-term trends in Spanish landings (tonnes), effort (trips), CPUE (kg/days*bhp/100) and mean size (mm CL) in catch.

j) Cantabrian Sea (31)



Cantabrian Sea (FU 31): Percentage changes in long-term landings and stock biomass and in short-term landings following various percentage changes in fishing effort. Separate plots shown for males and females.

3.11.9.b *Nephrops* in Division IXa

Units included in recommended Management Area: a) West Galicia (Unit 26), b) North Portugal (Unit 27), c) Southwest Portugal (Unit 28), d) South Portugal (Unit 29) and e) Gulf of Cadiz (Unit 30).

Catch data (Tables 3.11.9 b.1-3.11.9 b.2) :

Year	Rec TAC	Agreed TAC	ACFM landings
1987		4.8	1.6
1988		4.8	1.3
1989		4.8	1.4
1990		4.7	1.2
1991	1.84	3.0	1.3
1992	1.3	2.5	1.3
1993	1.3	2.5	1.1
1994	1.3	2.5	0.9
1995	1.3	2.3	

(Weights in '000 t)

Historical Development of the Fishery: Landings from Management Area fluctuating without clear trend since 1984. For West Galicia and SW and S Portugal landings on a slight downwards trend in recent years (graphs a and j).

State of stock: a) West Galicia: CPUE and mean size fluctuating without trend (graphs b and c). The last yield per recruit analysis (1993) suggested that current F is above F_{max} (graph d).

b) North Portugal (graphs e-h): no recent effort or CPUE data. Mean size now increasing (graph h). The last yield per recruit analysis (1991) suggested that F is above F_{max} in males but below F_{max} in females (graph i).

c) + d) SW and S Portugal (graphs j-m): CPUE declined in the last five years (graph l). TSB and recruitment showing slight declines. Effort stable at present. Yield per recruit analysis shows that F is above F_{max} in males and below F_{max} in females (graph n - changed input parameters). F stable in age-based assessment.

e) Gulf of Cadiz: no information.

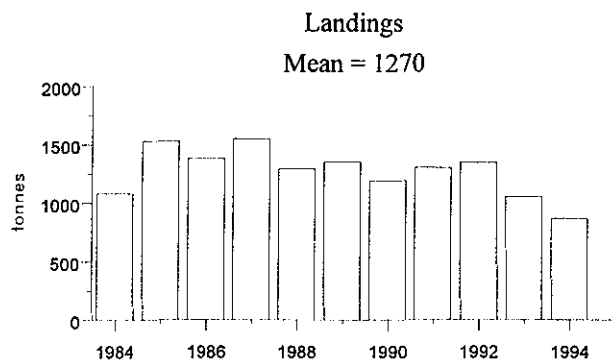
Management advice: ACFM advises a TAC of 1,300 t in 1996 and 1997.

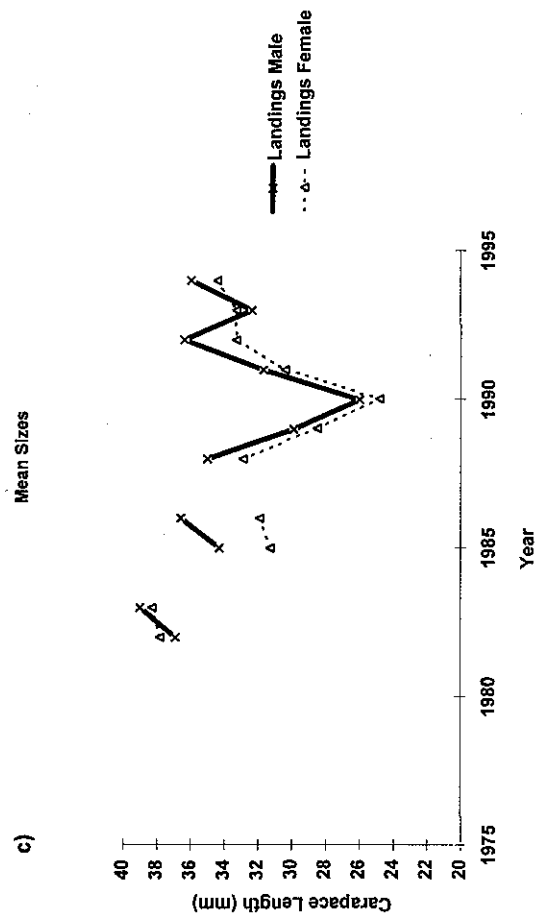
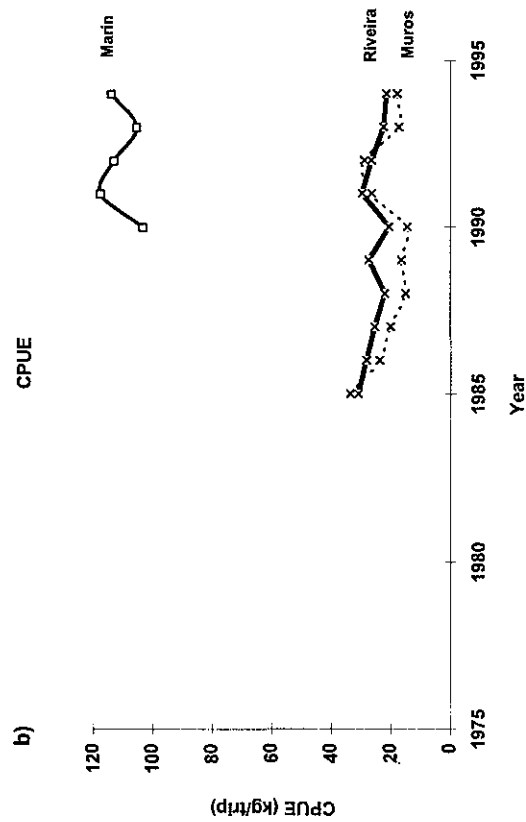
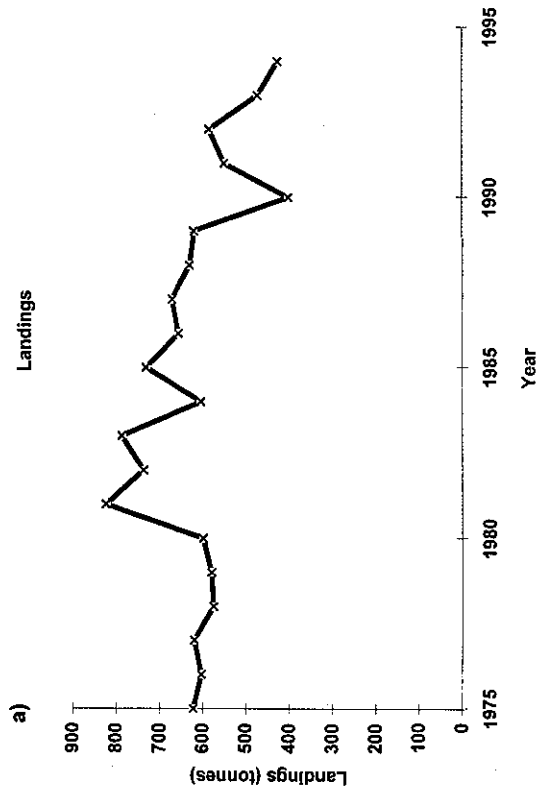
Special comments: ACFM advised a TAC of about 1,300 t for the management area in 1993-1995. There is no basis for revising this figure for 1996 and 1997. It should be noted that this recommended management area includes five functional units and that a TAC set for the entire area will not necessarily result in balanced exploitation between the five units.

Data and assessment: a) CPUE and mean size data - no new assessments. b) CPUE, effort and mean size available but quality questionable - no new assessments. c) + d) CPUE, effort and mean size data. Length-based and age-based assessment carried out, but not considered reliable. e) No data - no assessment.

Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

Landings from recommended Management Area
(Details in Table 3.11.9 b.3).

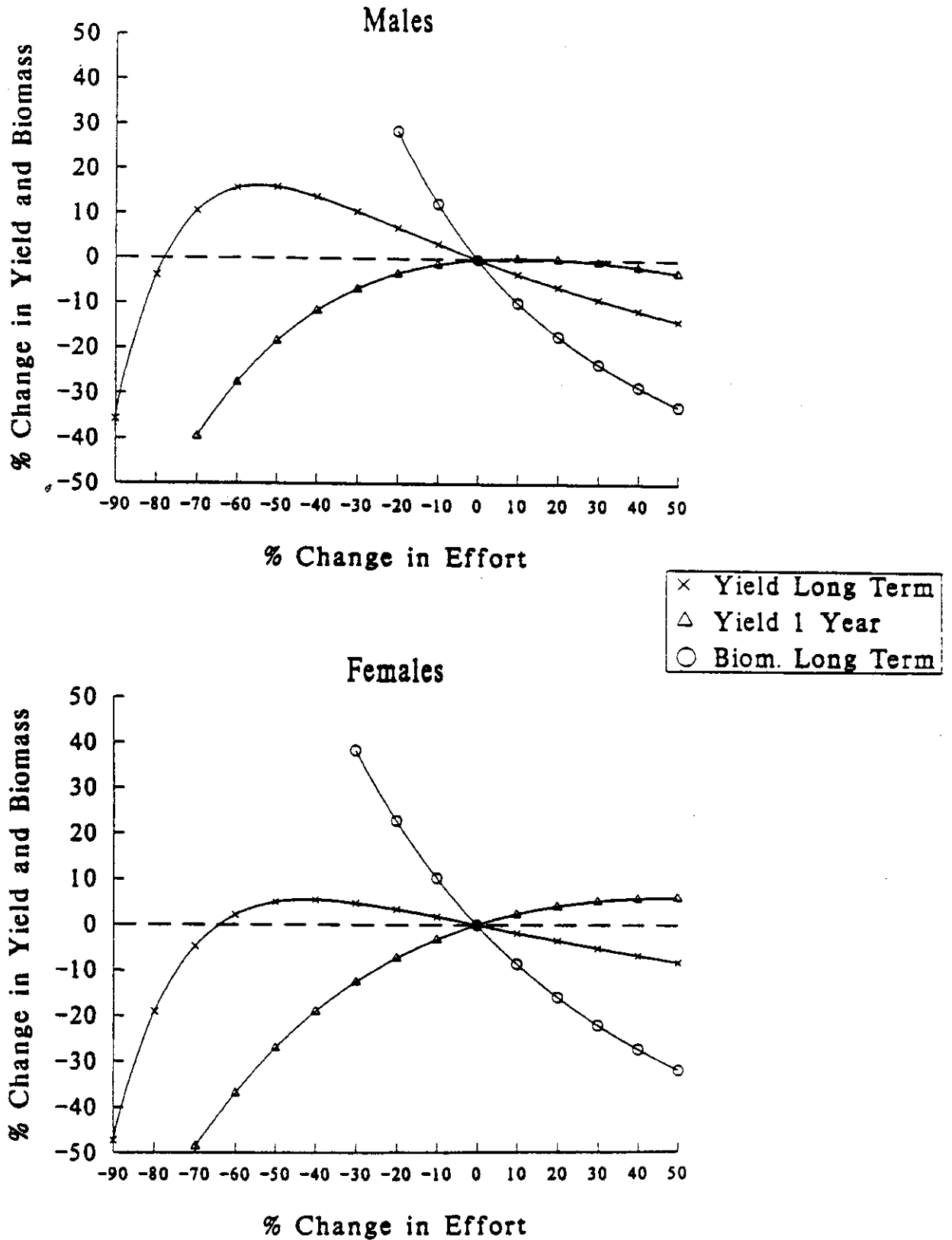




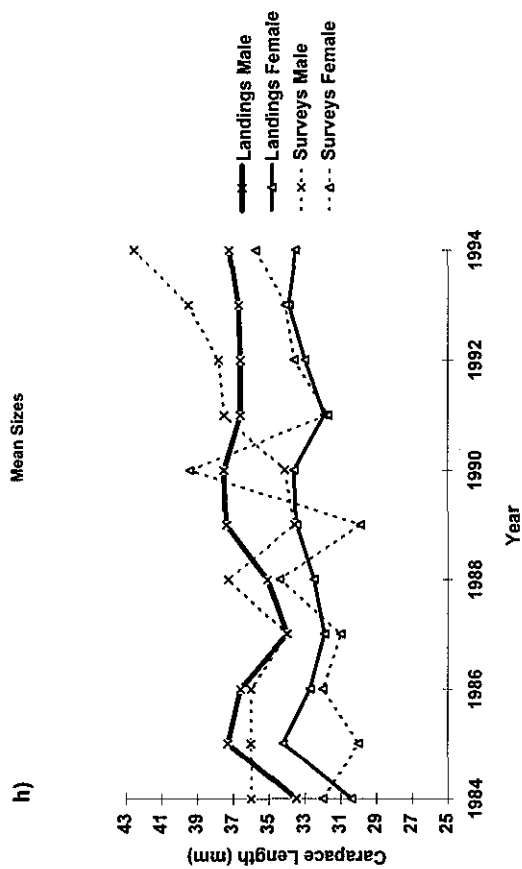
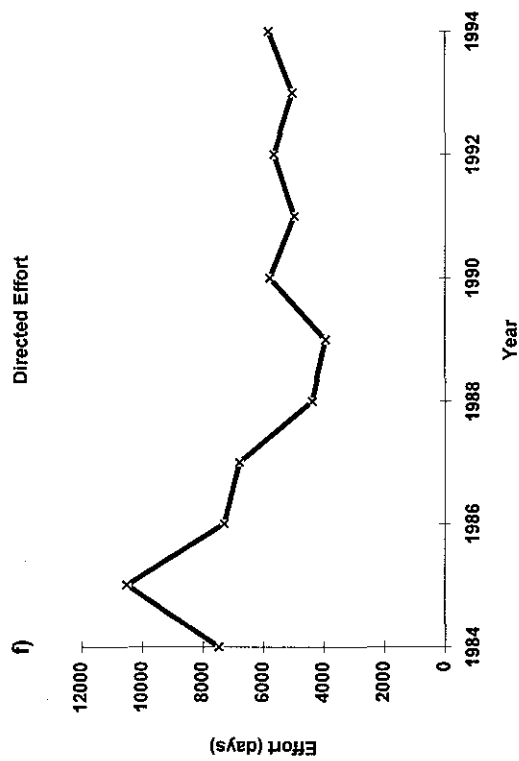
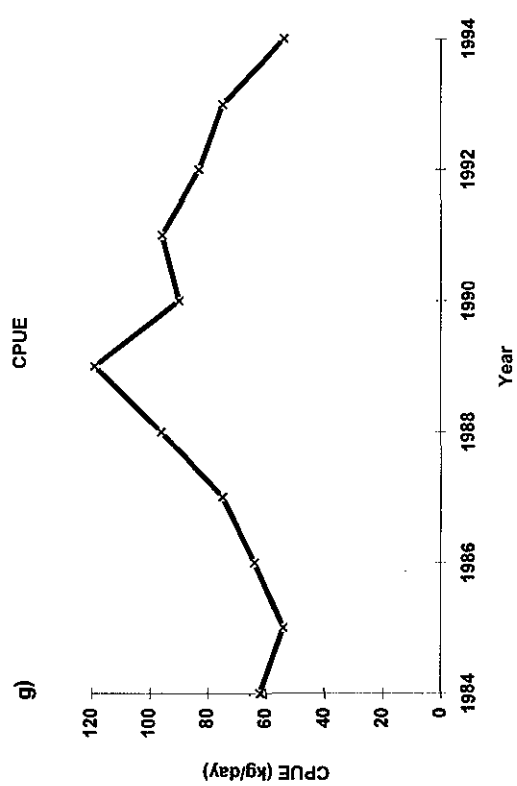
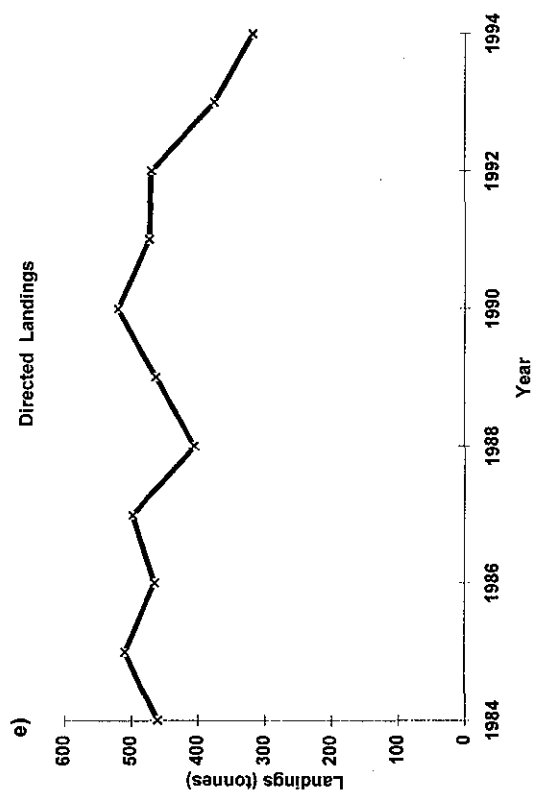
West Galicia (FU 26): Long-term trends in landings (tonnes), CPUE from home ports Muros, Riveira and Marin (kg/trip) and mean sizes (mm CL) in landings.

d)

West Galicia (26)



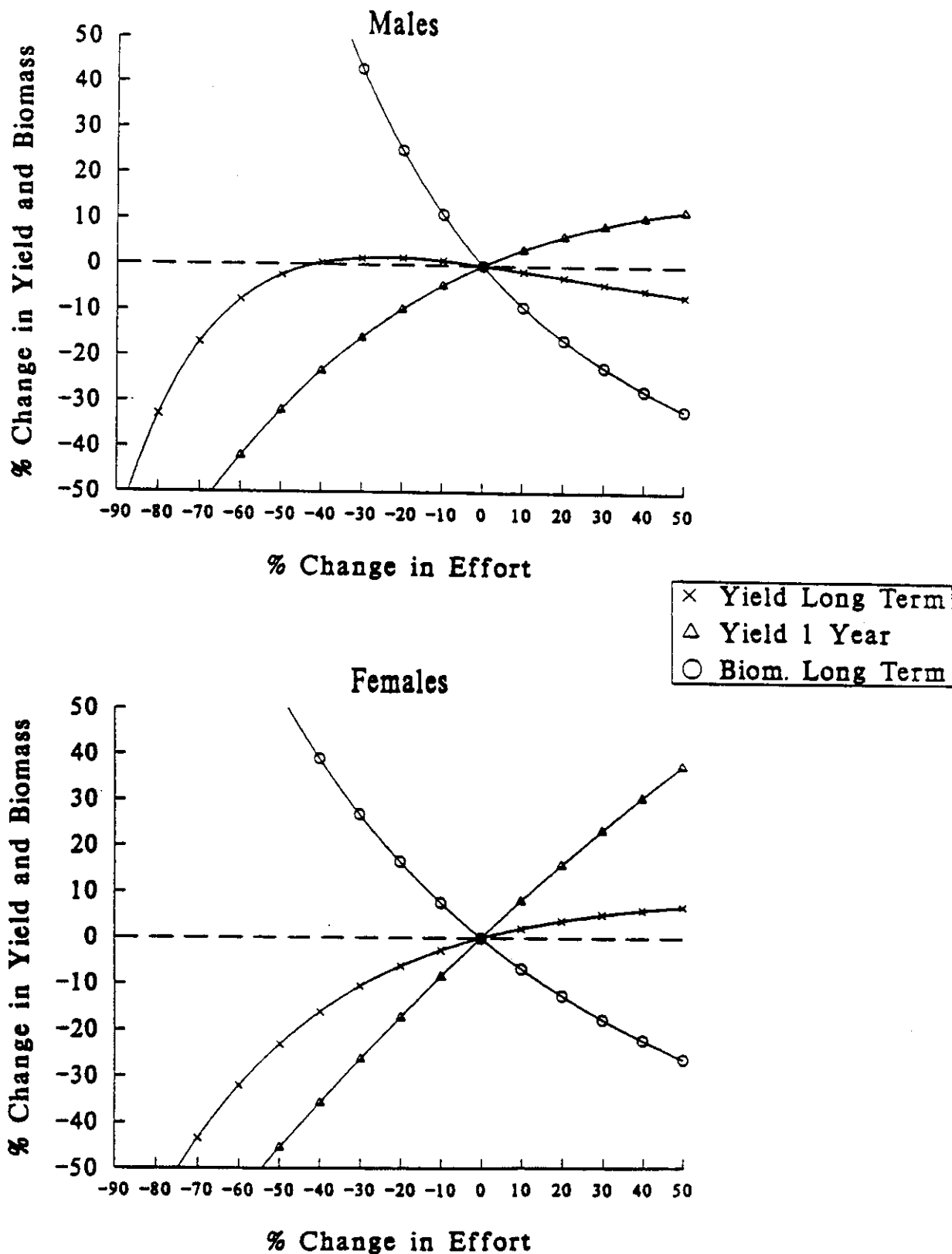
West Galicia (FU 26) 1991-92: Percentage changes in long-term landings and stock biomass and in short-term landings following various percentage changes in fishing effort. Separate plots shown for males and females.



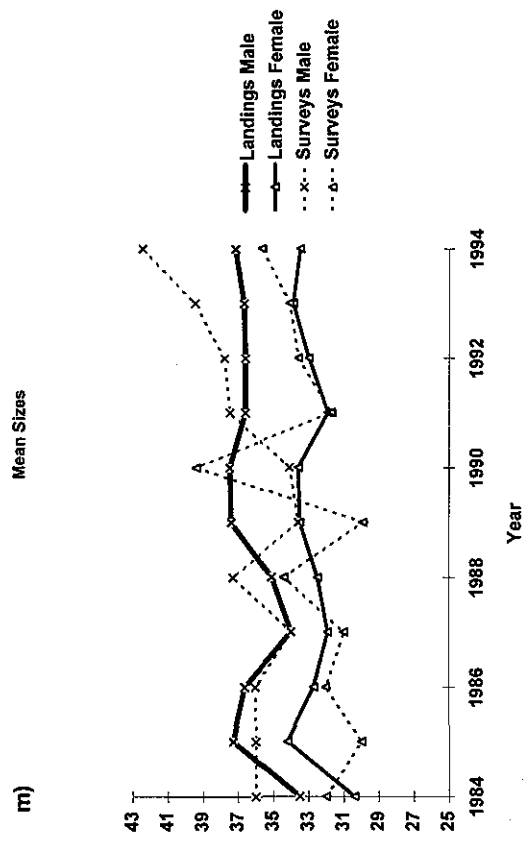
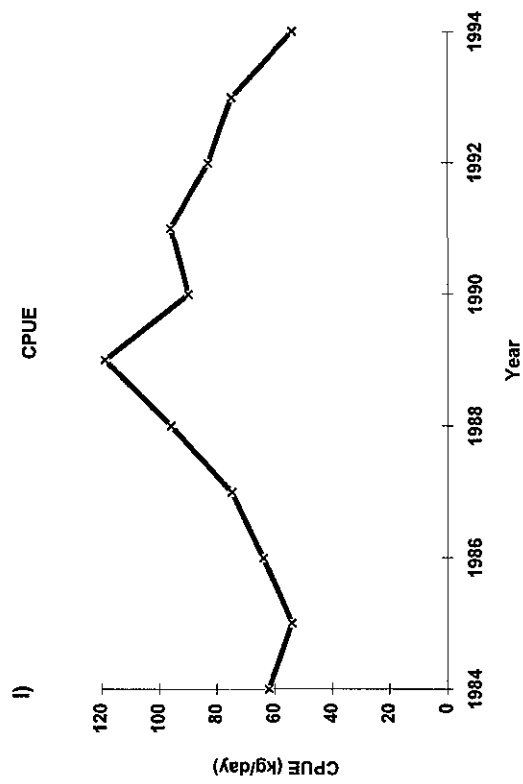
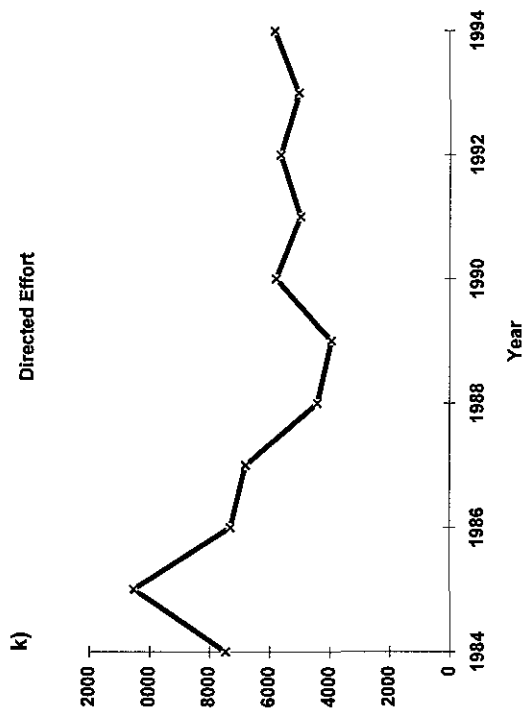
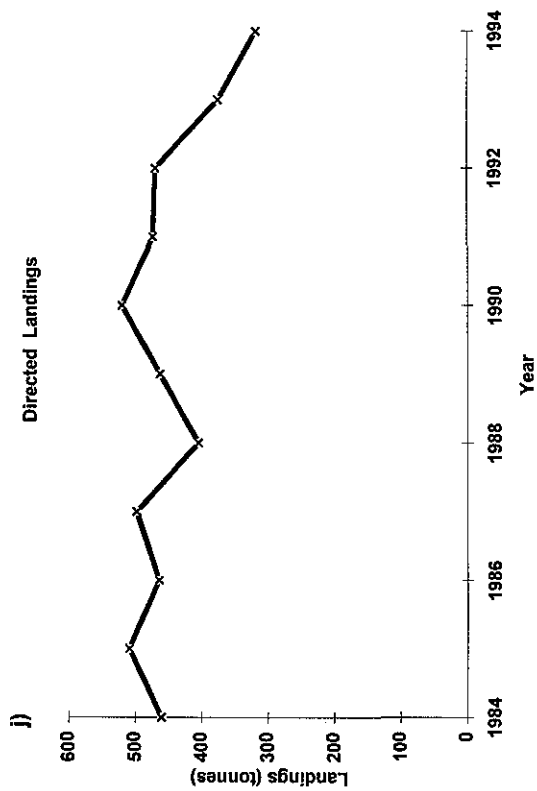
North Portugal (FU 27): Long-term trends in directed trawl landings (tonnes), effort (hours), CPUE (kg/hour) and mean sizes (mm CL) in the landings.

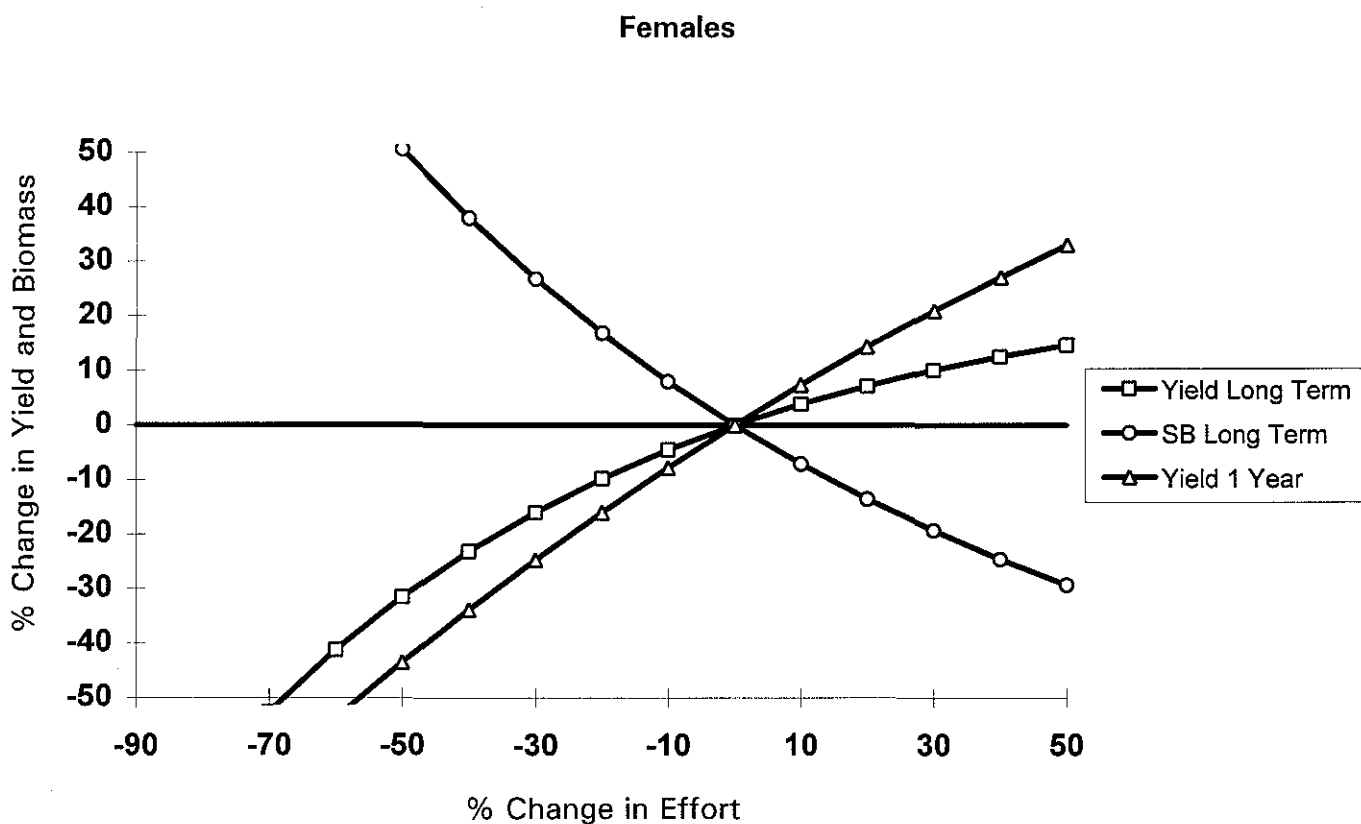
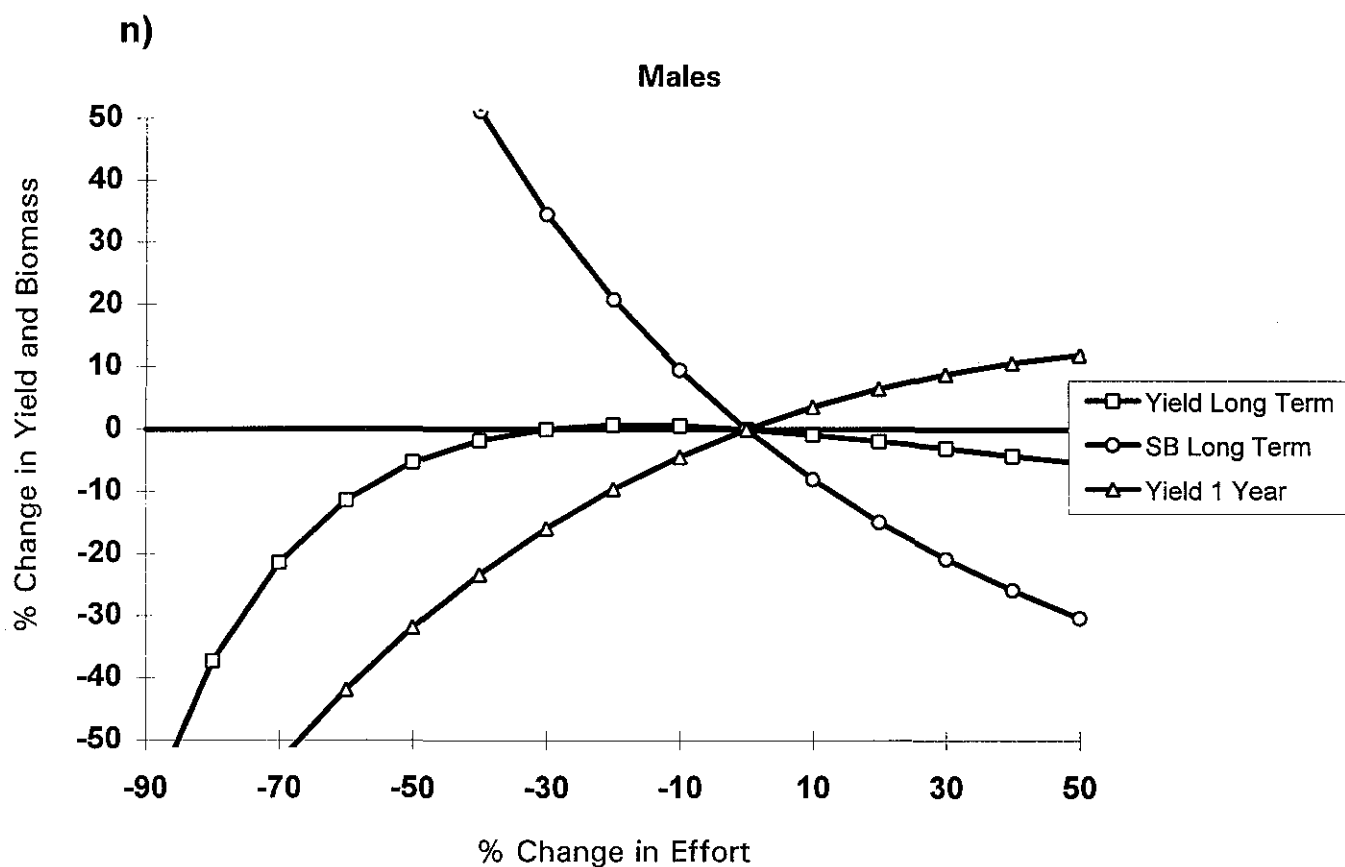
North Portugal (27)

i)



North Portugal (FU 27): Percentage changes in long-term landings and stock biomass and in short-term landings following various percentage changes in fishing effort. Separate plots shown for males and females.





SW and S Portugal (FU's 28 and 29): Percentage changes in long-term landings and stock biomass, and short-term landings following various changes in fishing effort. Males and females shown separately.

3.11.9.c *Nephrops* in Division IX b and Sub-area X

Special comments: There are no reported landings of *Nephrops* from this area, so it is suggested that a zero TAC would prevent misreporting.

Source of information: Report of the Working Group on *Nephrops* Stocks, March 1995 (C.M.1995/Assess:12).

3.12 Widely distributed and migratory stocks

3.12.1 Overview

A number of stocks assessed by ACFM are not confined to the areas considered in other sections of this report. They include species whose stock units are distributed over much wider areas such as Northern hake and a number of deep-water species, and migratory species such as mackerel, horse mackerel and blue whiting.

The fisheries for many of these species are summarised in the area overviews, and in this section of the report the detailed assessments and advice are given for each stock considered.

Most of the stocks concerned are fished in different fisheries throughout their area of distribution.

3.12.2 Hake - Northern stock (Division IIIa, Sub-areas IV, VI and VII, and Divisions VIIa,b)

Catch data (Table 3.12.2.1):

Year	Rec. TAC	Agreed TAC ²	ACFM Indgs.	Disc. slip.	ACFM catch
1987	- ¹	63.46	63.3	2.0	65.3
1988	54	66.16	64.8	2.0	66.8
1989	54	59.67	66.5	2.3	68.8
1990	59	65.1	59.9	1.5	61.4
1991	59	67.0	57.6	1.7	59.3
1992	61.5	69.0	56.6	1.7	58.3
1993	-	71.5	52.1	1.5	53.6
1994	<46	60.0	51.3	2.9	54.2
1995	31	55.1			

¹Based on recent landings. ²Sum of area TACs corresponding to Northern stock plus Division IIIa (EC zone only). ³Precautionary. Weights in '000 t.

Historical development of the fishery: Since the pre-war period, hake has been the main species supporting the development of the steam-, then motor-trawl fleets in ports of the Atlantic coasts of France and Spain. In these two countries, which make up about 85% of the landings, it still ranks among the first species in value landed, despite the decline of landings. Hake is present in the catches of nearly all fishery units identified in Sub-areas VII and VIII.

The fishery has been subject to TAC's since 1986. Initially these were set on a precautionary basis. In recent years, they exceeded the actual catch possibilities. The fishery is also subject to technical measures regarding mesh sizes of trawls and minimum landing size, but compliance is known to be poor.

State of stock: The stock is considered to be outside safe biological limits. SSB has been decreasing continuously since 1987, reaching new record-low levels in each year since 1991. Current SSB is 30% below the long-term average. Fishing mortality has been increasing in recent years and is 20% above average.

Further details in Table 3.12.2.2.

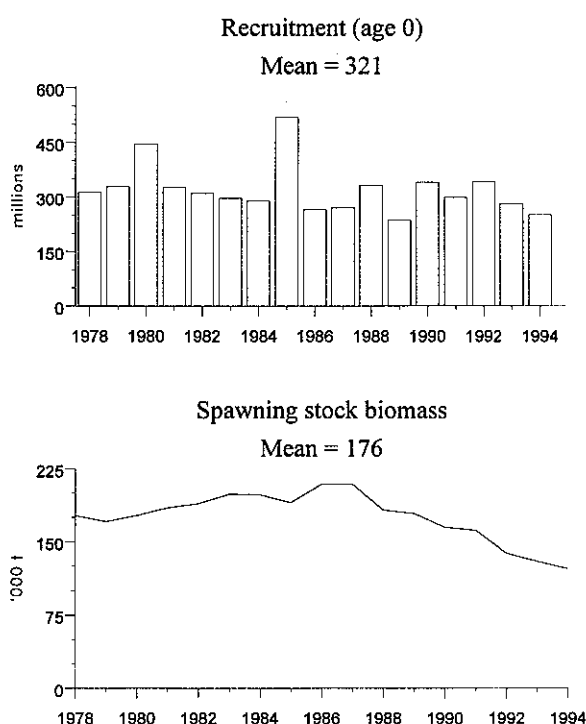
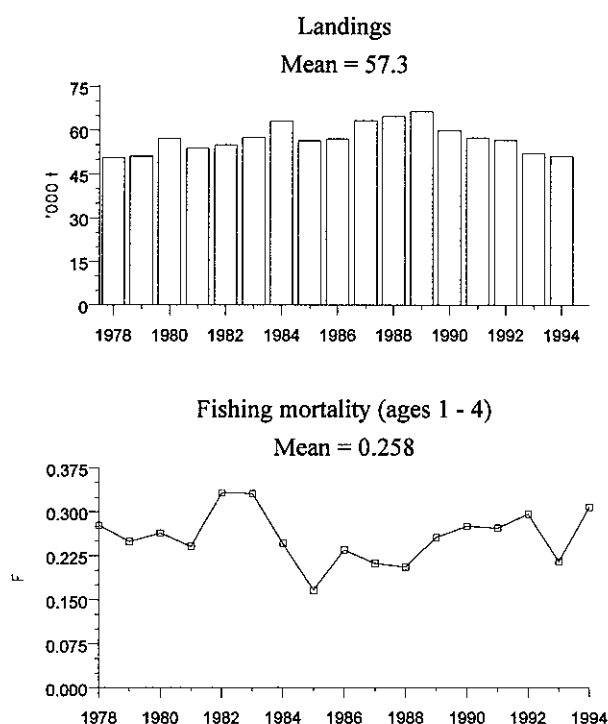
Forecast for 1996:

SSB(95) = 125.6, F(95) = 0.31, Basis: F(95)= F(94), Catch(95) = 57.6, Landings (95) = 56.0.

Option	Basis	F (96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.4F ₉₄	0.12	119.9	24.5	23.7	143.0
B	0.6F ₉₄	0.19		35.3	34.2	131.8
C	0.7F ₉₄	0.22		40.4	39.1	126.5
D	0.8F ₉₄	0.25		45.2	43.8	121.5
E	1.0F ₉₄	0.31		54.4	52.7	112.1
F	1.2F ₉₄	0.37		62.8	60.8	103.5

Weights in '000 t.

Continued fishing at present levels leads to a further decline in SSB.



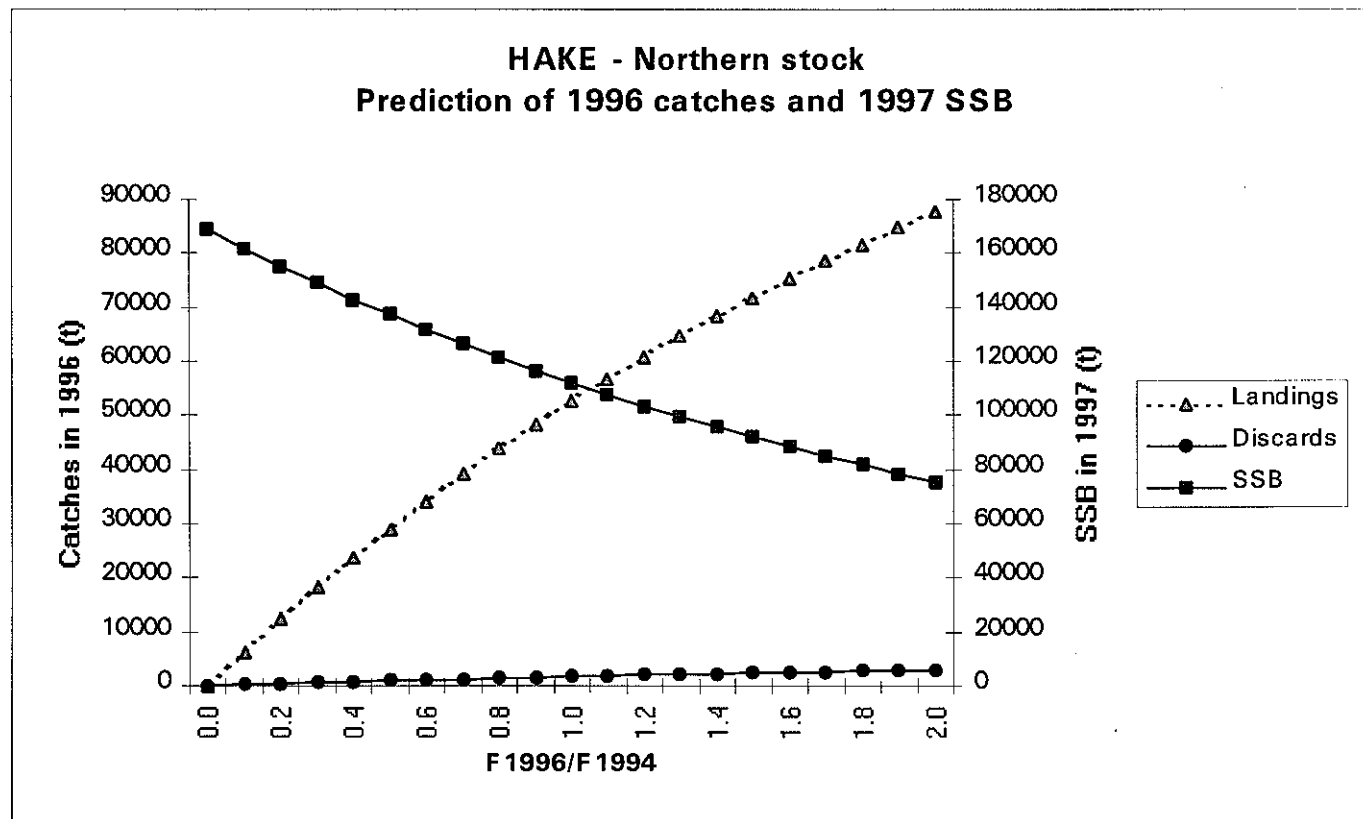
Medium-term considerations: Medium-term predictions presented last year, but which are still relevant, indicated that there is a high probability that SSB and landings are likely to decrease steadily if the recent level of fishing mortality is maintained. A significant reduction in fishing mortality is required to increase SSB in the medium term to the average of recent years.

Management advice: ACFM recommends that fishing mortality in 1996 be reduced by 30% from the 1994 level. ACFM notes that large numbers of juvenile hake are still being caught and recommends that current legislation on mesh size and minimum landing size be enforced. This would assist but would not be sufficient by itself for a prompt recovery of SSB.

Special Comment: There is some doubt about the size of the 1992 year class. This year class was estimated to be abundant in the Celtic Sea but poor in the Bay of Biscay. This is a change from the usual distribution of juvenile hake and leads to some uncertainty in the catch forecast. However, large numbers of this year class are now appearing in the commercial catches in the Bay of Biscay.

Data and assessment: Length composition data by fishery unit available annually for 1978-1989 and quarterly for 1990-1994. Prior to 1992 converted to age compositions by numerical methods. For 1992-1994 age readings were used. Data include discards estimates.

Source of information: Report of the Working Group on the Assessment of Southern Shelf Demersal Stocks, September 1995 (C.M.1996/Assess:5). Assessment revised by ACFM.



3.12.3 Mackerel (Combined Southern, Western and North Sea spawning components)

Introduction

The mackerel caught in north-east Atlantic waters have so far been treated as three stock units, North Sea, Southern and Western mackerel. This stock differentiation has mainly been based upon differences in spawning areas and time as observed in egg surveys in the North Sea, Western and Southern areas. However, overlapping in egg distributions between Southern and Western spawning areas have been observed. Tagging experiments in the North Sea and in the Western areas have revealed differences in migration patterns between North Sea and Western mackerel. These experiments have demonstrated that there have been considerable changes in migration patterns since 1970. Due to these changes large proportions of Western mackerel are caught in the North Sea (Sub-area IV) and in the Norwegian Sea (Division IIa) in the second half of the year. Since it is impossible to split the mackerel caught in these areas by stocks all the catches have been allocated to the Western mackerel and the catches of North Sea mackerel have thereby been included in the assessment of Western mackerel since 1988. Due to large differences in spawning biomass this has a

negligible impact on the assessment of Western mackerel. As estimated from egg surveys the spawning biomass in the North Sea is about 3% of that spawning in Western areas.

In March-April 1994 about 10,000 mackerel were tagged in a Spanish tagging experiment in the south-east corner of the Bay of Biscay. Within four months 67 tags had been recovered. These recoveries demonstrated that mackerel migrated from the tagging area to the North Sea and Norwegian Sea and thus mixed with North Sea and Western mackerel. Since it is impossible to split catches into the different stocks ACFM decided to carry out a combined assessment of mackerel, including the North Sea, Southern and Western spawning components.

Based on egg surveys in 1995 the Western and Southern spawning components are preliminarily estimated at 1.97 million t and 330,000 t respectively. The egg surveys in 1992 and 1995 demonstrated that the spawning biomass in the Southern area is about 15% of that spawning in the Western area. The spawning area in the North Sea will be investigated in June-July 1996.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M.1995/Assess:7) and additional information supplied to ACFM.

Combined Stock

Catch data (Tables 3.12.3.1-6)

Year	Total				
	Rec. TAC	Agreed TAC ¹	Official ² landings	Disc. ¹ slip.	ACFM catch ²
1987		442	589	11	655
1988		610	621	36	676
1989		532	507	7	586
1990		562	574	16	626
1991		612	599	31	668
1992		707	723	25	760
1993		767	778	18	825
1994		837	792	5	823
1995		645			

¹Data on discards and slipping from only two fleets,

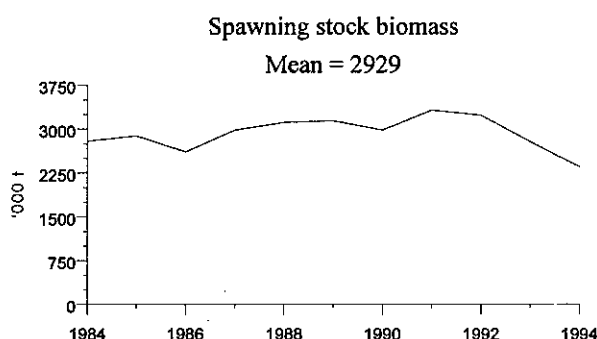
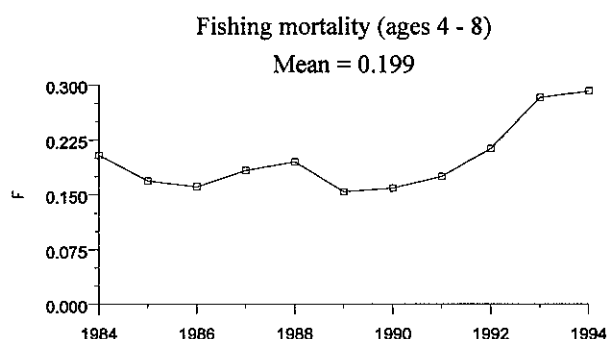
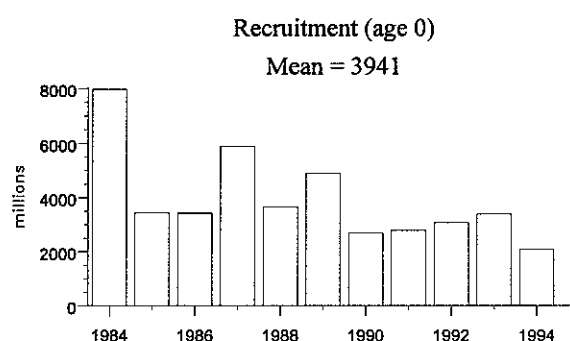
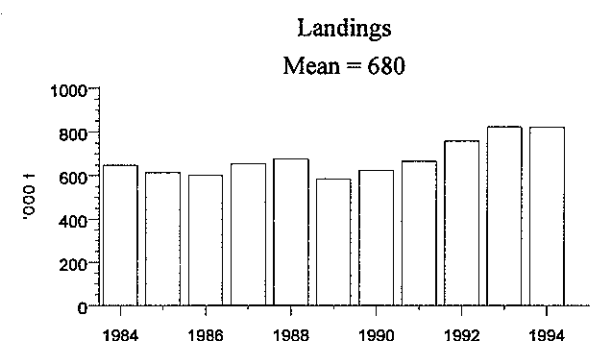
²Landings and discards from IIa, IIIa, IV, Vb, VI, VII, VIII and IXa. ³As reported to ICES up to October 1995, ⁴All areas except international waters in II; ⁵Significant reduction in F. Weights in '000 t.

Historical development of the fishery: The historical development of the fisheries for the different spawning components is given on the following pages.

State of the stock: The stock may be outside safe biological limits. The time series is too short to evaluate this fully from the combined assessment, but the assessment of the Western component indicates that the SSB is at the lowest recorded level. The North Sea component was above 3 million t in the early 1960's. No information is available on the size of the other stock components during this period. The combined assessment indicates increasing fishing mortalities in recent years.

Details in Table 3.12.3.7.

Forecast for 1996: The forecast for 1996 is based on mean recruitment and a catch level in 1995 of 650,000 t (VIa, VII, VIIIa,b, Vb, IIa, IIIa, and IV) consisting of 608,000 t within agreed TAC's and 42,000 t outside agreed TAC's including catches in international waters. In the southern area (Divisions VIIIc and IXa) mackerel are mainly taken as by-catch in other fisheries and the expected catch in 1995 at the 1994 level of fishing mortality is 20,000 t giving a total predicted catch of 670,000 t of mackerel in 1995. The 1994 year class seems to be poor but is poorly estimated.



SSB(95)=2121, F(95)=0.26, Basis: TAC , Catch(95) = 670, Landings (95) =

Option	Basis	F (96)	SSB (96)	Catch (96)	SSB (97)
A	0.2 F ₉₄	N 0.057 S 0.002	2071	144 4	2327
B	0.4 F ₉₄	N 0.114 S 0.003	2026	280 8	2174
C	0.6 F ₉₄	N 0.170 S 0.005	1983	409 12	2032
D	0.8 F ₉₄	N 0.227 S 0.007	1940	532 15	1901
E	1.0 F ₉₄	N 0.284 S 0.008	1899	648 18	1780

Weights in '000 t.

- N: Northern area comprising the Western areas, North Sea, Skagerrak and Norwegian Sea (IIa, IIIa, IVa, Vb, VI, VII, VIIIa,b,d)
S: Southern area (VIIIc, IXa)

Management advice: To restore and maintain the spawning stock biomass within the range observed in the short time series available **ACFM recommends a significant reduction in fishing mortality.**

Special comments: To restore and maintain the spawning stock biomass above the historically low SSB in the time series (2.3 million t) by the time of spawning in 1997 the fishing mortality in 1996 has to be reduced by 80% compared with 1994, corresponding to a catch in 1996 of 4,000 t in the Southern area and 144,000 t in the Northern area (see footnote below forecast table above). A reduction in fishing mortality of 60% in 1996 will bring the the SSB above this level by the time of spawning in 1998, corresponding to a catch in 1996 of 8,000 t in the Southern area, and 280,000 t in the Northern area.

Since 1985 considerable catches have been taken in international waters in the Norwegian Sea and have not been counted against any TAC. ACFM advises that the advice given applies to all areas where mackerel are caught.

Data and assessment: In considering the mackerel as one single stock, it has not been possible to carry out an assessment for the period prior to 1984 because of lack of appropriate data for the Southern component.

There is concern about the uncertainties in the catch figures due to underreporting of catches, discards and slipping of catches. However, so far it has been impossible to correct the catch data because of lack of information. ACFM recommends that data on discards and slipping should be provided.

Western component

Catch data (Table 3.12.3.5):

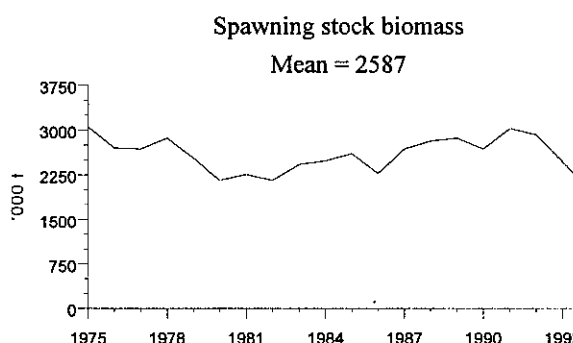
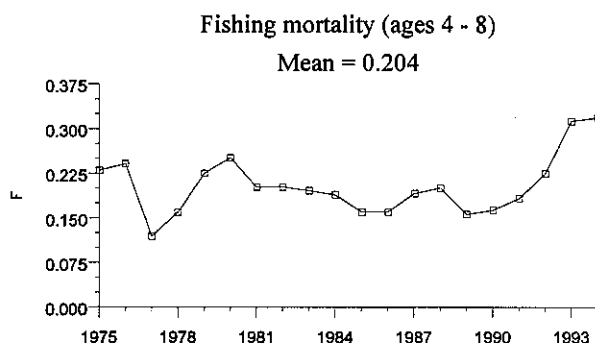
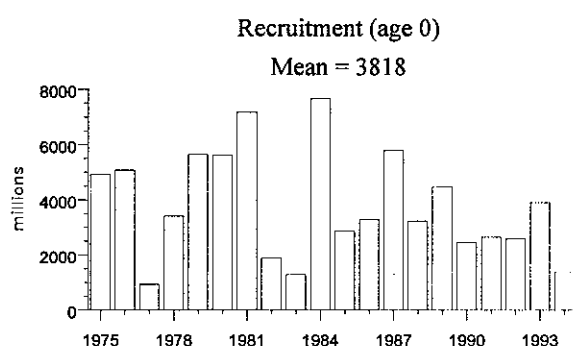
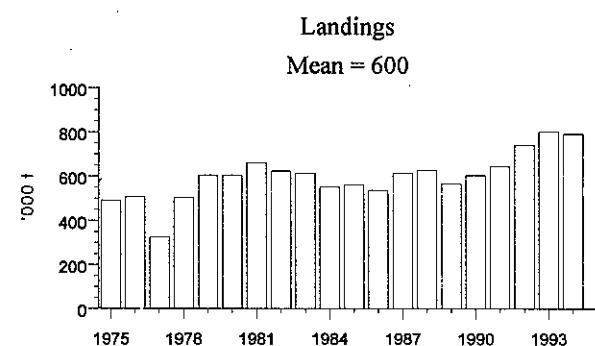
Year	Rec. TAC ¹	Agreed TAC ²	Official ³ landings	Disc. slip	ACFM catch ³
1987	380	405	567	11	615
1988	430	573 ²	593	36	628
1989	355	495 ²	504	7	567
1990	480	525 ²	570	16	606
1991	500	575 ²	597	31	646
1992	670	670 ²	716	25	742
1993	670	730 ²	777	18	805
1994	831 ⁴	800 ²	791	5	793
1995	530	608 ²			

¹Recommended TACs for VI, VII, VIIla,b, Vb, IIa and, from 1988, IV. ²TAC for mackerel taken in all areas VI, VII, VIIlabd,Vb,IIa,IIIa,IV(excluding VIIlc, IXa and international waters) ³Landings and discards of Western component. ⁴Catch at *Status quo* F. ⁵As reported to ICES by October 1995. ⁶See combined stock. Weights in '000 t.

Historical development of the fishery: The fishery has developed from low levels in the sixties to more than 800,000 t in 1993. In 1994 there was a slight decrease in the catch level. The main catches are taken in directed fisheries by purse seiners and trawlers. Large catches of this component are taken in the North Sea and Norwegian Sea.

State of component: The spawning component of the Western area was estimated in international egg surveys in 1995, and a preliminary estimate is 1.97 million t which is close to the historical minimum and close to the spawning biomass predicted by ACFM in 1994. This component declined and is at its lowest level since 1972. Stock diagrams for the Western stock component are given below for illustrative purposes, to show the historical perspective from 1975-1994.

Details are given in Table 3.12.3.8.



North Sea component

Catch data (Tables 3.12.3.2, 5, 6):

Year	Rec. TAC ^{1,2}	Agreed TAC ³	ACFM catch ⁴
1987	LPL	55	3
1988	LPL	55	6
1989	LPL	49.2	7
1990	LPL	45.2	10
1991	LPL	65.5	- ⁵
1992	LPL	76.3	- ⁵
1993	LPL	83.1	- ⁵
1994	LPL	95.7	- ⁵
1995	LPL	76.3	

¹TAC for Sub-area IV and Division IIIa. ²LPL = Lowest Possible Level. ³TAC for Sub-area IV, Divisions IIIa, IIIb,c,d (EU zone) and Division IIa (EU zone). ⁴Estimated landings of North Sea component. ⁵No information. Weights in '000 t.

Historical development of the fishery: Large catches were taken in the sixties in the purse seine fishery reaching a maximum level of about 1 million t in 1967, but in recent years the catch level is assumed to be about 1% of that level.

Catch data for this component are uncertain, affected by the fact that the North Sea stock mixes partly with the Western stock in the feeding areas. Since 1987 it has not been possible to split the catches taken in the North Sea and adjacent areas into their North Sea and Western mackerel stock components. A comparison of the spawning stock estimates based on the egg surveys in 1988 and 1990 indicated a catch of about 10,000 t in 1990. A catch at the same level as in 1990 is assumed for 1991 to 1994.

Details are given in Table 3.12.3.9.

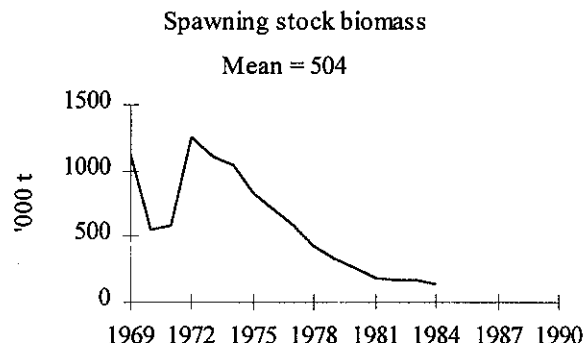
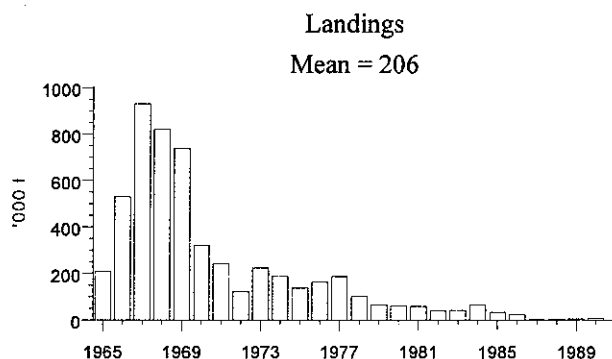
State of component: From tagging experiments a spawning biomass was estimated in the early sixties, before the boom in the purse seine fishery, of over 3 million t. The last big year class observed in this stock was the 1969 year class which was produced by a spawning biomass of 1.1 million t. The stock rapidly declined. The spawning biomass declined to less than 200,000 t in the early 1980s, and to 78,000 t (about 3% of the Western component) in 1990 (see Table 3.12.3.9). There have been no signs of any strong year classes in the international bottom trawl surveys in the North Sea.

The component is severely depleted. Limited egg surveys in 1991 and 1992 indicate no change in the SSB since 1990. A new egg survey will be carried out in June-July 1996.

Management advice: Beyond the advice given for the combined stock this spawning component still needs the maximum possible protection and ACFM therefore reiterates its previous recommendations:

- There should be no fishing for mackerel in Divisions IIIa and IVb, c at any time of the year.
- There should be no fishing for mackerel in Division IVa during the period 1 January - 31 July.
- The 30 cm minimum landing size at present in force in Sub-area IV should be maintained.

Special comments: The above measures are aimed at enhancing the probability of the recovery of this spawning component. Maximum protection could be given to the North Sea spawning component by closing mackerel fisheries in the North Sea and Subareas II, III and VI but, since a considerable quantity of the Western mackerel component is present in these areas during the second half of the year, this would seriously affect the fishery for the Western mackerel component. The closure of Divisions IVb,c gives protection to juvenile mackerel which are quite abundant in the area during the third and fourth quarters.



Southern component

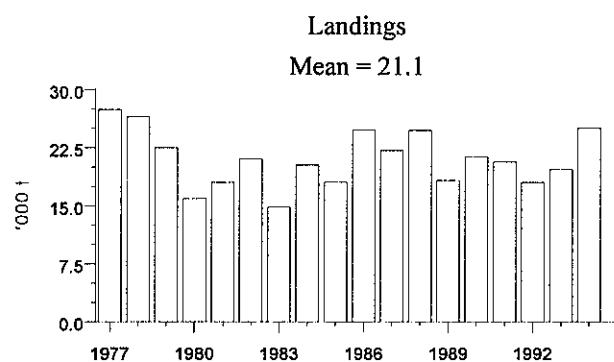
Catch data (Tables 3.12.3.4–6):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987	-	36.57	22
1988	-	36.57	25
1989	-	36.57	18
1990	-	36.57	21
1991	-	36.57	21
1992	-	36.57	18
1993	-	36.57	20
1994	-	36.57	25
1995	-	36.57	

¹Division VIIIc, Sub-Areas IX and X, and CECAF Division 34.1.1 (EU waters only). ²See combined stock. Weights in '000 t.

Historical development of the fishery: Mackerel is a target species for the hand-line fleet during the spawning season (about one third of total catches) in Sub-Division VIIIc east, and is a by-catch for other fleets. The highest catches (about 80%) are taken in the first half of the year and mainly in Division VIIIc with adult fish. In the second half of the year the catches consist of juveniles, mainly in Division IXa. Catches have been very stable for a number of years.

State of component: The egg surveys in 1995 indicate a spawning biomass of 330,000 t. Based on egg surveys in 1992 and 1995 the Southern spawning component is about 15% of the western component.



3.12.4 Western horse mackerel (Divisions IIa, IVa, Vb, VIa, VIIa-c,e-k, VIIla,b,d,e)

Catch data (Table 3.12.4.1–5):

Year	Rec. TAC	Agreed TAC ¹	ACFM landings	Disc. slip	ACFM catch ²
1987	-	155	157	-	157
1988	-	169	184	4	188
1989	100	153	267	1	269
1990	~200	203	363	10	373
1991	- ³	230	328	5	334
1992	- ³	250	369	2	371
1993	- ³	250	424	9	433
1994	- ³	300	385	4	389
1995	- ³	300			

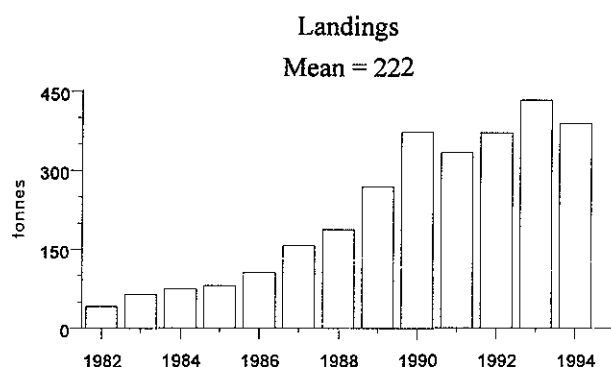
¹Division Vb (EU waters only), Sub-areas VI and VII, Divisions VIIla,b,d,e. ²See Table 3.12.4.5. ³ACFM recommended reduction in catch or fishing mortality. Weights in '000 t.

Historical development of the fishery: The catches increased in the 1980s due to the extremely strong 1982 year class. Changes in migration pattern became evident at the end of the 1980s when the largest fish in the stock (mainly the 1982 year class) migrated into Divisions IVa and IIa during

the 3rd and 4th quarters. Since 1987 considerable catches have been taken by the Norwegian purse seine fleet for reduction purposes particularly in Division IVa, while most catches of other countries have been taken for human consumption purposes in Sub-areas VI, VII and Division VIIla,b,d,e. The 1982 year class has dominated the catches for many years and still constitutes in 1994 a major part (56% by weight and 38% in numbers) of the catches.

State of stock: The stock is considered to be within safe biological limits. The preliminary spawning stock biomass estimate of 1.64 million t based on the 1995 egg surveys, is well above the SSB producing the 1982 year class. Egg surveys in 1992 and 1995 and an analytical evaluation show a reduction in SSB from 2.5 million t in 1992 to 1.6 million t in 1995.

Medium-term considerations: A medium-term forecast from 1996–2001 was carried out assuming average recruitment of 1067 million fish at age 1 (geometric mean, excluding the 1982 year class). The underlying basis for the forecast was the preliminary SSB estimate of 1.64 million t from the egg surveys in 1995. The forecast was carried out using five options: four options of annual catches of: 100,000 t, 200,000 t, 300, 000 t and 400,000 t and one option of $F = M = 0.15$ as shown in the figure on the next page. The large 1982 year class was generated by a SSB estimated to be 500,000 t based on the 1983 egg survey. Fishing at a constant level of $F = M = 0.15$ will give a gradual decrease in the catch level from 260,000 t in 1996 to 140,000 t in 2001. SSB gradually decreases over this period from 1.4 to 0.8 million t.



With annual catches of 300,000 t and 400,000 t the SSB is expected to go below 0.5 million t in 2001 and 2000 respectively.

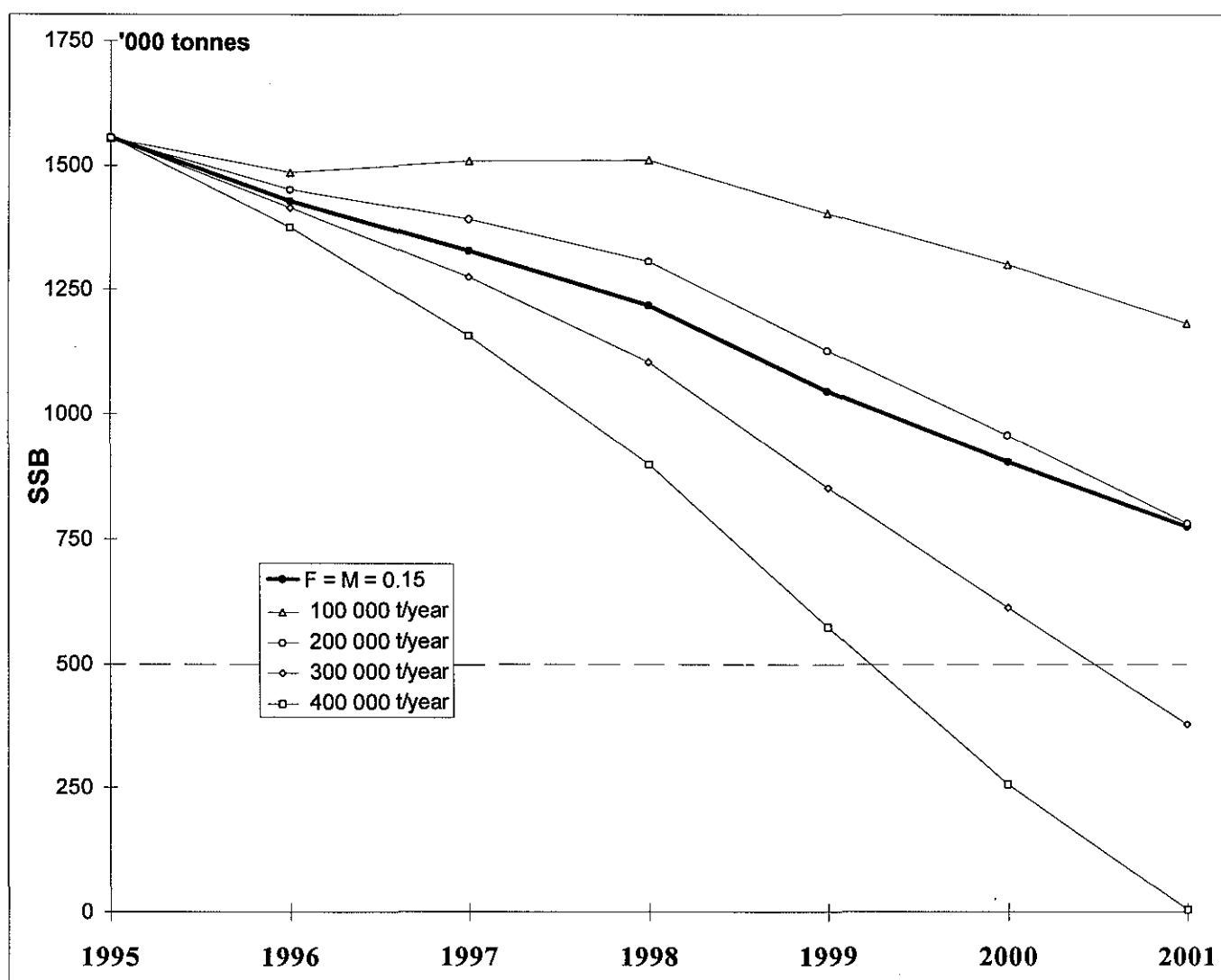
Management advice: This fishery is still dependent on the strong 1982 year class. To maintain the SSB above 500,000 t in the medium term it may be necessary to reduce the fishery within the next few years.

Special comments: EU sets a TAC applicable to EU vessels. This TAC only applies to parts of the total fishery. ACFM recommends that a TAC should apply to all areas where

Western horse mackerel are fished, i.e. Divisions IIa, IIIa (western part), IVa, Vb, VIa, VIIa-c,e-k, VIIIa,b,d,e.

Data and assessment: The assessment is based on triennial egg surveys. As in previous years a major part of the catch was unsampled. ACFM recommends that sampling needs to be improved. The maturity ogive is uncertain.

Source of information: Report of the Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy, October 1995 (C.M.1996/Assess:7).



3.12.5 Blue whiting combined stock (Sub-areas I-IX, XII and XIV)

Catch data (Tables 3.12.5.1-5)

Year	Rec TAC	Agreed TAC	ACFM Catch
1987	950	-	664
1988	832	-	553
1989	630	-	625
1990	600	-	562
1991	670	-	370
1992	-	-	474
1993	490 ¹	-	476
1994	485 ²	650 ³	455
1995	518 ²	650 ³	

¹Catch at *status quo* F. ²Precautionary. ³NEAFC proposal for NEAFC regions 1 and 2. Weights in '000 t.

Historical development of the fishery: The fishery for blue whiting was fully established in 1977. Most of the catches are taken in the directed pelagic trawl fishery in the spawning and post-spawning areas (Divisions Vb, VIa,b and VIIb,c) but they are also caught in an industrial mixed fishery in Sub-area IV and Division IIIa and in the pelagic trawl fishery in the Norwegian Sea (Sub-areas I and II, Divisions Va, XIVa, b). The catches in the southern fishery (Sub-areas VIII, IX, Divisions VIId,e and g-k) have been stable in the range 29,000-43,000 t.

Details in Table 3.12.5.6.

State of stock: The stock size is not precisely known. The acoustic data series indicates a decrease in SSB from 1982 to 1992 and an increase in 1995. The strong 1989 year class is still dominating in the adult stock and the acoustic surveys in 1995 indicate that the 1994 year class is also strong.

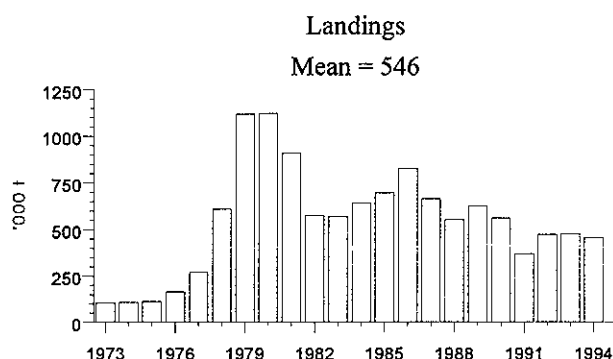
Management advice: If a TAC is to be set for this stock, a precautionary TAC based on catches in recent years seems appropriate (the 1988-1994 mean equals 500,000 t).

Special comments: The blue whiting has been treated as one stock as it has not been possible to clearly demonstrate significant differences between fish from various parts of the distribution area, or to define an unambiguous borderline between populations. The distribution area for adult blue whiting and the fishing areas are given in Figures 3.12.5.1 and 3.12.5.2.

ACFM is uncertain as to the actual level of this stock as both the levels and trends in the estimates based on acoustic surveys and the catch analysis are conflicting. Survey estimates of the spawning stock points to a level of 4-6 million t whereas the catch analysis indicates a stock size of 1.6-2 million t. Until the causes of these discrepancies are found ACFM cannot produce reliable stock estimates.

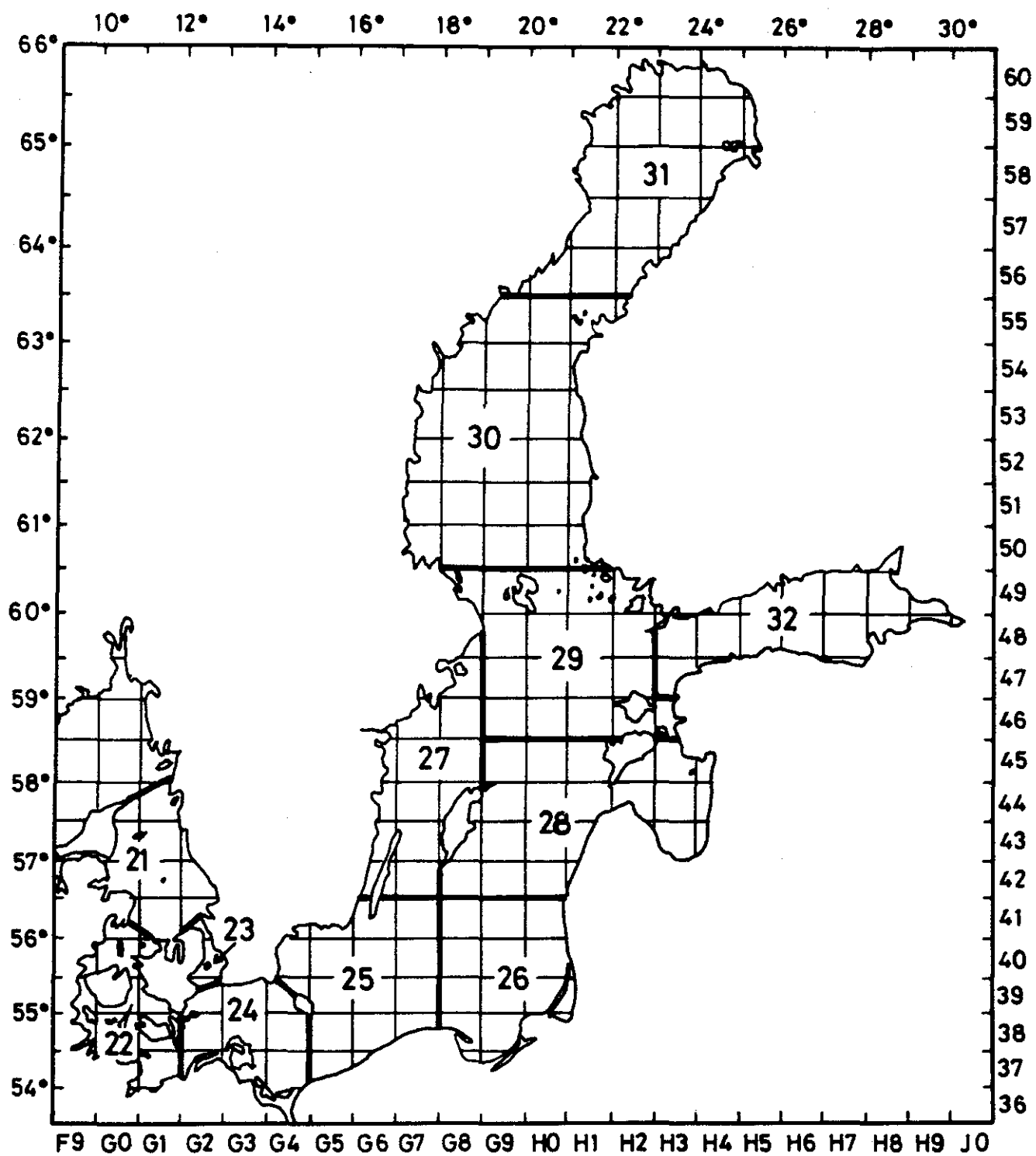
Data and assessment: An analytical assessment using catch-at-age data tuned to acoustic survey results was attempted. The assessment is not considered reliable due to inconsistencies in the catch-at-age data and different trends in the acoustic and analytical SSB estimates.

Source of information: Report of the Atlanto-Scandian Herring, Capelin and Blue Whiting Assessment Working Group, October 1995 (C.M.1996 /Assess:8).



3.12.6 Deep-Water Fisheries Resources South of 63°N

Any new information available on deep-water fisheries resources will be provided by ACFM in May 1996.



Baltic Fishing Areas

3.13 Stocks in the Baltic

3.13.1 Overview

The main fisheries for cod in the Baltic are those using demersal trawls, high opening trawls (operating both pelagically and demersally) and gillnets. There has been an increase in gillnet fisheries in the 1990s and the share of the total catch of cod taken by gillnets is now about 50%. The Baltic herring is exploited mainly by pelagic trawls, demersal trawls and trap nets/pound-nets during the spawning season. The main body of sprat catch is taken with pelagic pair trawling for industrial purposes. Baltic salmon is exploited by drift nets, trap-nets and longline fisheries.

An overview of catches of fish in the Baltic is given in Section 3.13.2.

Baltic cod is managed as one unit covering all Sub-divisions 22-32. However, ACFM considers the stocks in Sub-divisions 22-24 and Sub-divisions 25-32 as separate stocks. **As in previous reports ACFM recommends that the two cod stocks in the Baltic should be managed separately.**

For cod, unusually strong year classes in 1976, 1979 and 1980 formed the basis for an increase in the stock and an expansion in the fisheries. Catch levels more than doubled and the fishery attracted vessels from other Baltic fisheries and from fleets normally operating outside the Baltic. In almost all years landings have been far above the levels recommended by ACFM. The decline in stock size and landings started around 1984 and continued up to 1992. The fleet capacity and fishing effort have not been reduced at the same rate and the fishing mortality has increased during the stock decline. Improved recruitment in the early 1990s has resulted in spawning stock biomasses increasing above the 1992 minimum and this increase has been seen especially in the western Baltic cod stock. The recovery of the eastern Baltic cod stock has been slower.

The success of cod reproduction is, among other things, dependent on certain minimum levels of salinity and oxygen concentration for the fertilisation and survival of the eggs and larvae. The unusually long period with low influx of North Sea water from 1977 - 1991 coincided with low recruitment. New influxes since 1991 have resulted in improved environmental conditions which allow the possibility of improved recruitment but do not ensure it. The effect of an intrusion of North Sea water into the Baltic Sea is usually sufficient to support better environmental conditions at maximum for two spawning seasons (about 1.5 years) because after that period the oxygen content is not sufficient for the survival of cod eggs in the deep water layers.

The recent improvement in recruitment and reversal of the downward trend in spawning stock biomass have been seen in both the western (Sub-divisions 22 and 24) and eastern

(Sub-divisions 25-32) stocks. However, fishing mortalities are still estimated to be very high. It is therefore considered that a precautionary approach including reductions in fishing effort is needed if these stocks are to recover on a more permanent basis.

The actual stock and exploitation levels cannot be estimated with the accuracy needed for making forecasts of future catches and stock sizes due to a dramatic deterioration in the data on recent catches.

There have been increasing difficulties in monitoring the fisheries exploiting Baltic cod in recent years. **Since 1992 catch data from the cod fisheries have been unreliable as a result of mis- and underreporting.** ACFM is concerned about the deterioration of the quality of catch and effort data from a number of important fisheries. As a consequence, ACFM is unable to provide reliable estimates of current stock sizes and forecasts of future catch levels. Trends in stock size and the overall state of the stocks can to some extent be evaluated from research vessel surveys but such information alone is not sufficient to give the short-term TAC advice usually requested.

In the herring and sprat fisheries, herring are mainly caught in the open sea by trawls (pelagic single- and pair-trawls) and in coastal waters during spawning time both by pound-nets and gillnets. Sprat are fished by pelagic trawls mainly for industrial purposes.

Unfavourable market conditions for herring have been reflected in decreased landings for human consumption but the landings of both herring and sprat for industrial purposes have increased markedly during the last few years. Sprat is used mainly for human consumption when landed in the countries on the eastern Baltic coasts, but for production of fishmeal and oil in the countries on the west coast.

Herring in the Baltic is, as in former years, assessed as four stocks. This is to be regarded as a compromise between using the larger number of stocks/populations that have been identified on biological grounds and the practical aspects such as in what units catch figures are available and possibilities for correctly allocating individual fish to particular stocks.

Sprat is considered to be one stock in the whole Baltic and is consequently assessed as one unit.

The pelagic stocks in the Baltic are exploited at a low or medium level and the stock biomasses are at or above their respective long-term average levels. They are regarded to be within safe biological limits.

It has, for several reasons, been difficult to estimate the absolute levels of stock size for the pelagic stocks, whereas the development of stock sizes in relative terms is better described. Low fishing mortality in comparison with the natural mortality, which makes the catch analysis less

reliable, inconsistencies between years in the results from acoustic surveys and low precision in the estimates of species composition in the mixed fisheries have contributed to the variation in stock estimates given during the latest years.

The spring-spawning stock of herring in Sub-divisions 22-24 and Division IIIa migrates after the spawning season into the Kattegat and Skagerrak, where it mixes with the North Sea herring stock during the feeding period.

Difficulties in separating catches from the considerably larger North Sea stock, uncertain catch statistics and conflicting trends in survey indices have resulted in no reliable assessment being available.

For **Baltic salmon and Sea trout** reference is made to the overview in Section 3.13.11.

3.13.2 Nominal Catches in the Baltic Area

Officially reported catches in the Baltic are given in Tables 3.13.2.1-5. These are the catches officially reported to ICES by national statistical offices for publication in the *ICES Fishery Statistics*.

In the assessments, the working groups try to estimate discards and slipped fish, landings which are not officially reported, and the composition of by-catches. These amounts are included in the estimates of total catch for each stock and are used in the assessments; thus, they appear in the tables and figures produced by working groups. These estimates vary considerably between different stocks and fisheries, being negligible in some cases and constituting important parts of the total removals from other stocks. Further, the catches used by the working groups are broken down into sub-divisions, whereas the officially-reported by

some countries figures are reported by the larger Divisions IIb, c, and d. The trends in Tables 3.13.2.1-5 may not, therefore, correspond with those on which assessments have been based, and are presented for information only, without any comment from ACFM.

The 1990 catches listed under the Federal Republic of Germany and the German Democratic Republic refer to catches by vessels from the respective former territories during the whole of 1990, before and after political union. Thus, catches taken by vessels registered in the former German Democratic Republic in the months after unification are included in the German Democratic Republic figures.

The catch data used in the assessments are given in other tables.

3.13.3 Herring

3.13.3.a Herring in Sub-divisions 22-24 and Division IIIa (spring-spawners)

Catch data for Division IIIa and Sub-divisions 22-24 (Table 3.13.3 a.1):

Year	Rec. TAC ²	ACFM catch of stock
1987	-	175
1988	196	251
1989	174	186
1990	131	204
1991	178	192
1992	170	168
1993	150-181	171
1994	130-180	164
1995	- ³	

¹Including North Sea. ²Spring-spawners in IIIa and 22-24.

³Not exceeding recent catch levels. Weights in '000 t.

Historical development of the fishery: After a period of high landings in the early 1980s the landings have decreased to the long-term average.

State of stock: The state of the stock is uncertain as available information is conflicting. Landings have decreased in spite of increasing abundance indices and apparently large stock size. Uncertainties in data sources preclude an analytical assessment.

Forecast for 1996: Not available.

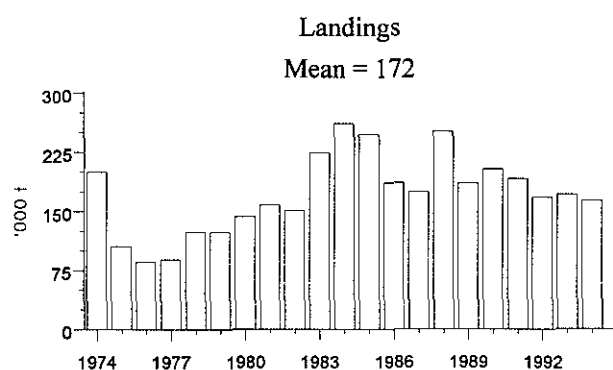
Management advice: If a precautionary TAC is required, ACFM advises that it should be established such that the catch does not exceed recent levels.

Special comments: Some of the fisheries which exploit this stock in Division IIIa also exploit the North Sea stock. Any increase in these fisheries may hamper recovery of the North Sea stock.

Data and assessment: Catch-at-age data are uncertain due to undersampling of landings, particularly in Division IIIa. There are problems with stock separation in historical data and with independent survey indices.

Source of information: Report of the Herring Assessment Working Group for the Area South of 62°N, March/April 1995 (C.M.1995/Assess:13).

(Details in Table 3.13.3 a.2).



3.13.3.b Herring in Sub-divisions 25-29 (including Gulf of Riga) and 32

Catch data (Tables 3.13.3 b.1):

Year	Rec. TAC	Agreed TAC	ACFM catch
1987			252
1988			286
1989			293
1990			244
1991	293		213
1992	343		218
1993			231
1994			243
1995	394	670 ¹	

¹ For whole of Baltic. Weights in '000 t.

Historical development of the fishery: From the beginning of the 1970s to 1985 annual landings fluctuated around 300,000 t. Due to market problems the landings decreased and in the last four years have been at a level somewhat higher than 200,000 t.

State of the stock: The stock is considered to be within safe biological limits. A decline in stock size during the period 1975-1989 was followed by an increase thereafter. Fishing mortality has decreased since 1986.

Forecast for 1996: A new forecast for 1996 is not provided as advice for both 1995 and 1996 was given in

the 1994 ACFM report. The forecast given for 1995 in the 1994 ACFM report can be used as a basis for 1996 as well.

Management advice for 1996: The advice given in 1994 for 1995 and 1996 is maintained : "the long-term yield could be raised by increasing fishing mortality. A 40% increase in fishing mortality is considered to be within safe biological limits. The catch corresponding to this level is 394,000 t and this could be taken in both 1995 and 1996."

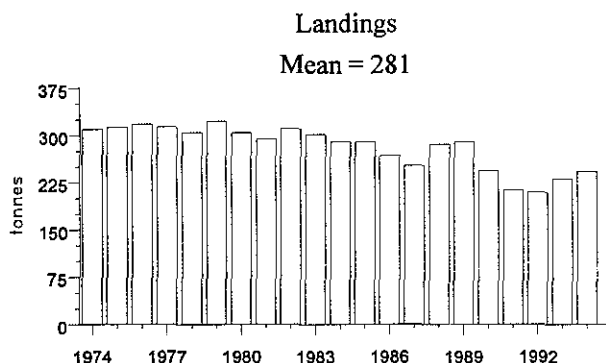
Special comments: It was stated in the 1994 ACFM report that this stock is well within safe biological limits and currently exploited at a low level of fishing mortality. An increase in fishing mortality to a level at which 394,000 t is taken in both 1995 and 1996 would still keep the stock within safe biological limits. Landings in 1994 and the results from the acoustic survey conducted in autumn 1994 have not given any reason for ACFM to change its advice for 1996.

ACFM has been requested to consider the appropriateness of assessing Gulf of Riga herring as a separate unit. A separate assessment can be made provided that abundance indices and catches of herring both within and outside the Gulf can be separated into stock units. A time series on this basis is not currently available for all fisheries. Due to stock mixing both within and outside the Gulf of Riga, ACFM does not for all fisheries find it appropriate to undertake separate assessments of this stock.

Data and assessment: The assessment of this stock is imprecise due to a complex stock structure with a broad spectrum of sizes at age, uncertainties in catch levels owing to insufficient sampling of especially the industrial fisheries, the large variabilities associated with the results from the acoustic surveys and the low fishing mortality.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

(Details in Table 3.13.3 b.2).



3.13.3.c Herring in Sub-division 30, Bothnian Sea

The fishing mortality is at a low level. Recruitment has been well above average in recent years with the 1992 year class being the highest on record.

Catch data (Table 3.13.3 c.1):

Year	Rec. TAC	ACFM catch
1987		25
1988		28
1989		29
1990		31
1991	32	26
1992	39	39
1993	39	40
1994	41 ¹	52
1995	73	

¹Catch at $F_{0.1}$. Weights in '000 t.

Historical development of the fishery: Landings increased from 1991 to 1994 and are at the highest level since 1973.

State of the stock: The stock is considered to be within safe biological limits. SSB increased from 1987 to 1991 and has subsequently levelled off at a record high level.

Forecast for 1996: A new forecast for 1996 is not provided as advice for both 1995 and 1996 was given in the 1994 ACFM report. The forecast given for 1995 in the 1994 ACFM report can be used as a basis for 1996 as well.

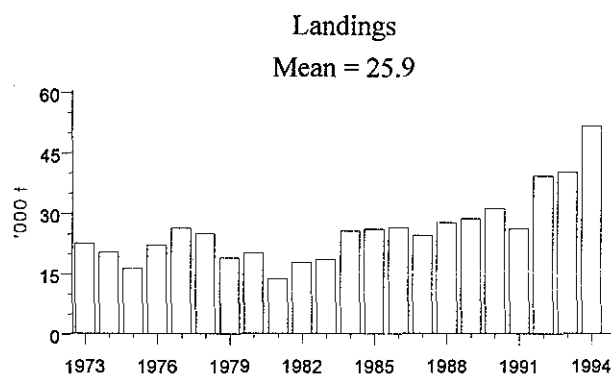
Management advice for 1996: The advice given in 1994 for 1995 and 1996 is maintained. A 40% increase in fishing mortality is considered to be within safe biological limits. The catch corresponding to this level is 73,000 t and this could be taken in both 1995 and 1996."

Special comments: It was stated in the 1994 ACFM report this stock is well within safe biological limits and currently exploited at a low level of fishing mortality. An increase in fishing mortality to a level at which 73,000 t could be taken in both 1995 and 1996 would still keep the stock within safe biological limits. New information has not given any reason for ACFM to change its advice for 1996.

Data and assessment: Although the relative changes in stock biomass are considered to be informative the absolute biomass estimates are uncertain due to low fishing mortalities.

Source of information : Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

(Details in Table 3.13.3 c.2).



3.13.3.d Herring in Sub-division 31, Bothnian Bay

Catch data (Table 3.13.3 c.1):

Year	Rec. TAC	ACFM catch
1987	9	8.1
1988	13	8.8
1989	7	4.4
1990	9	7.8
1991	9	6.8
1992	8	6.5
1993		9.2
1994	8	4.5
1995	18.4	

Weights in '000 t.

Historical development of the fishery: Within the last 10 years landings have fluctuated without trend, and are now at the second lowest value for the period.

State of the stock: The stock is considered to be within safe biological limits. The assessment of this stock is very uncertain and the actual level of SSB and fishing mortality is not known precisely. The fishing mortality is low and the stock is considered to be almost unexploited.

Forecast for 1996: A new forecast for 1996 is not provided as advice for both 1995 and 1996 was given in the 1994 ACFM report. The forecast given for 1995 in the 1994 ACFM report can be used as a basis for 1996 as well.

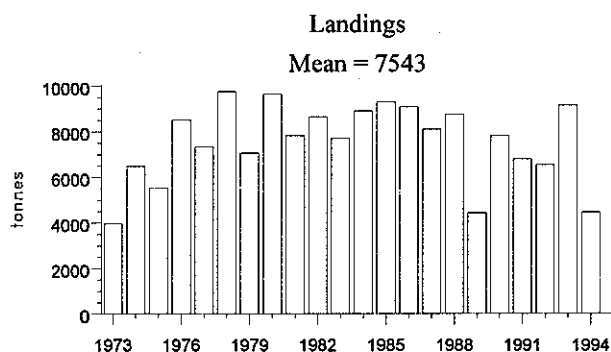
Management advice for 1996: The advice given in 1994 for 1995 and 1996 is maintained : "The stock is hardly exploited and ACFM considers that a doubling of fishing mortality would be within safe biological limits. The catch corresponding to this level is 18,400 t and this could be taken in 1995 and 1996."

Special comments: New information has not given any reason for ACFM to change its advice for 1996.

Data and assessment: Although the relative changes in stock biomass are considered to be informative the absolute biomass estimates are uncertain due to low fishing mortalities.

Source of information : Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

(Details in Table 3.13.3 d.1).



3.13.4 Sprat in Sub-divisions 22-32

Catch data (Tables 3.13.4.1–3.13.4.2):

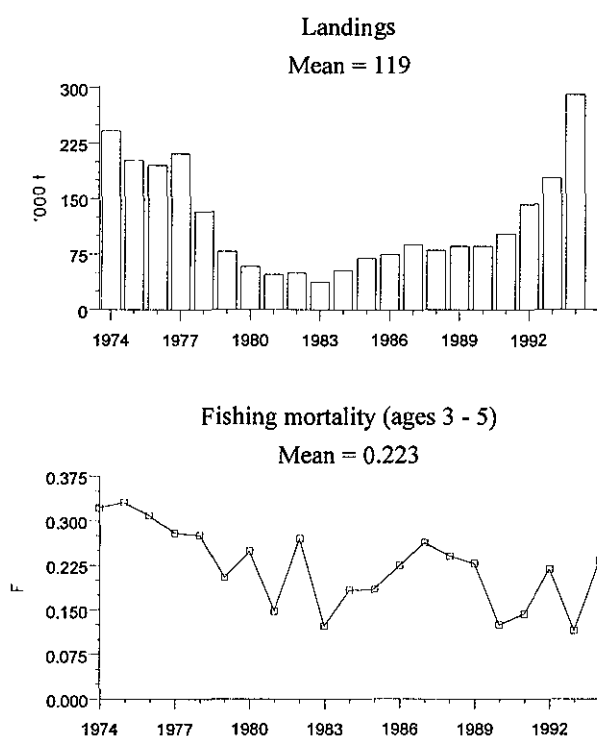
Year	Rec. TAC	Agreed TAC	ACFM catch
1987		117.2	88
1988		117.2	80
1989	72	142	86
1990	72	150	86
1991	150	163	103
1992	143	290	142
1993		415	178
1994		700	291
1995	205	500	

¹ catch at status quo F. Weights in '000 t.

Historical development of the fishery: Landings increased from 1983 to 1994. The increase in landings since 1992 is due to the development of an industrial pelagic fishery. The catches in this fishery consist mainly of sprat (about 70%) and herring (about 30%).

State of the stock: The stock is considered to be within safe biological limits. SSB has increased and is at its highest historical level. Fishing mortality has increased from 1993 to 1994 and is now at the average level for the period 1974-1994.

(Details in Table 3.13.4.3).



Forecast for 1996:

$F(95) = 0.24$, Basis: $F(95)=F(94)$, $Catch(95) = 295$, $Landings(95) = 295$, $SSB(95) = 1156$.

Option	Basis	F(96)	SSB (96)	Catch (96)	Lndgs (96)	SSB (97)
A	0.6F(94)	0.14	1196	175	175	1301
B	0.8F(94)	0.19	1175	228	228	1235
C	1.0F(94)	0.24	1155	279	279	1173
D	1.2F(94)	0.28	1134	328	328	1114
E	1.4F(94)	0.33	1115	375	375	1060

Weights in '000 t.

In all the above predictions the spawning stock will remain at high levels.

Management advice for 1996. There is little gain in yield to be achieved in the long-term by increasing fishing mortality above the current level.

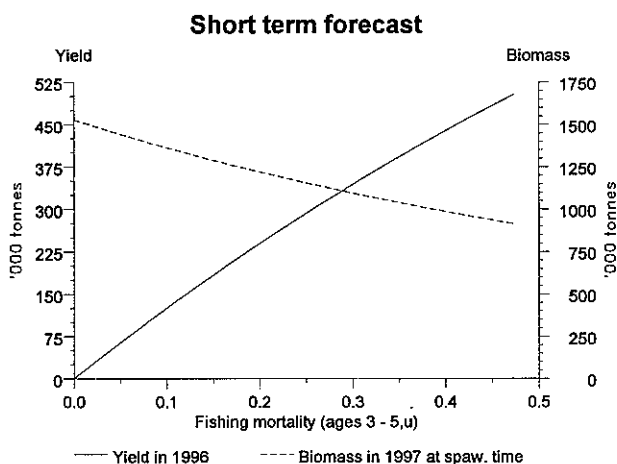
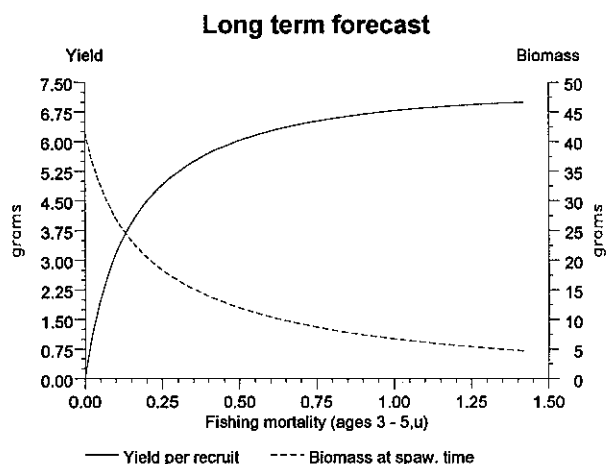
Special comments: Last year ACFM gave management advice for two years, 1995 and 1996, for this stock. This advice was based on an assumed catch in 1994 of 160 000 t. However, the actual catch in 1994 was 291 000 t and ACFM has therefore revised its advice.

The assessment is considered very uncertain due to the low exploitation level in some years and uncertainties concerning the composition of industrial catches. The historical trends in stock biomass, fishing mortalities and recruitment are considered to be informative, but the absolute levels of these parameters are uncertain.

Data and assessment: The assessment is based on catch data and acoustic surveys. The species composition of industrial catches used in the assessment is only approximate.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

Yield and Spawning Stock Biomass



3.13.5 Cod

Catches of cod in the Baltic are given by country in Table 3.13.5.1 and by country and Sub-division in Table 3.13.5.2.

3.13.5.a Cod in Sub-divisions 22 and 24

Catch data (Table 3.13.5 a.1):

Year	Rec. TAC	Agreed TAC ¹	Disc. slip.	ACFM catch
1987	9		3	28
1988	16			28
1989	14			18
1990	8			17
1991	11			15
1992	LPL			15
1993	LPL			19
1994	22			27
1995	- ²			

¹Included in TAC for total Baltic. ²30% reduction in effort. Weights in '000 t.

Historical development of the fishery: From 1965 to 1984 the landings varied between 40–50,000 t. They thereafter decreased to below 20,000 t in the period 1989–1991. The level of landings is uncertain, particularly since 1992, due to incomplete reporting of landings. It is likely that landings have increased and the best available estimate of total landings for 1994 is 27,000 t.

In the graphs below, the values for 1992–1994 are uncertain.

State of the stock: ACFM is not in a position to assess the state of the stock precisely. It may be at or outside safe biological limits. The spawning stock size declined since the mid-1980s to a very low level in the beginning of the 1990s as a result of low recruitment and high exploitation. The fishing mortality has been high, viz. 3–4 times the level corresponding to F_{max} . Due to recent improved recruitment the stock size is increasing. It is, however, evident that the exploitation level is high and that a continuation of this level will hamper stock recovery.

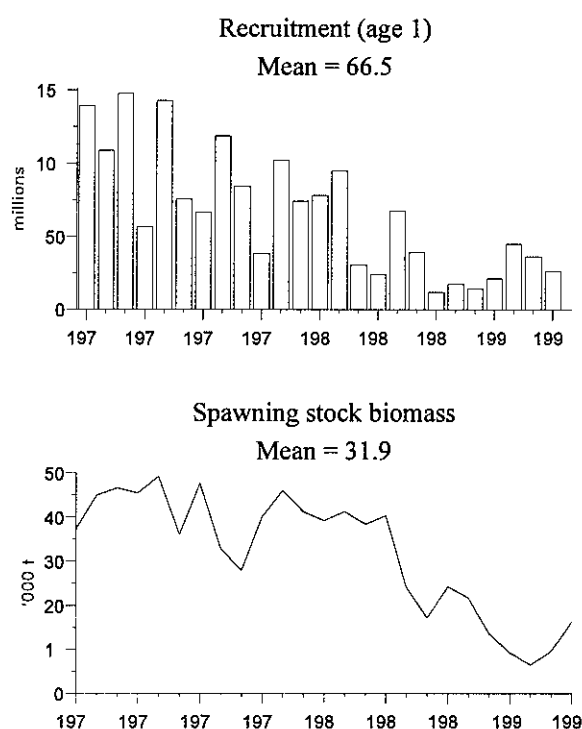
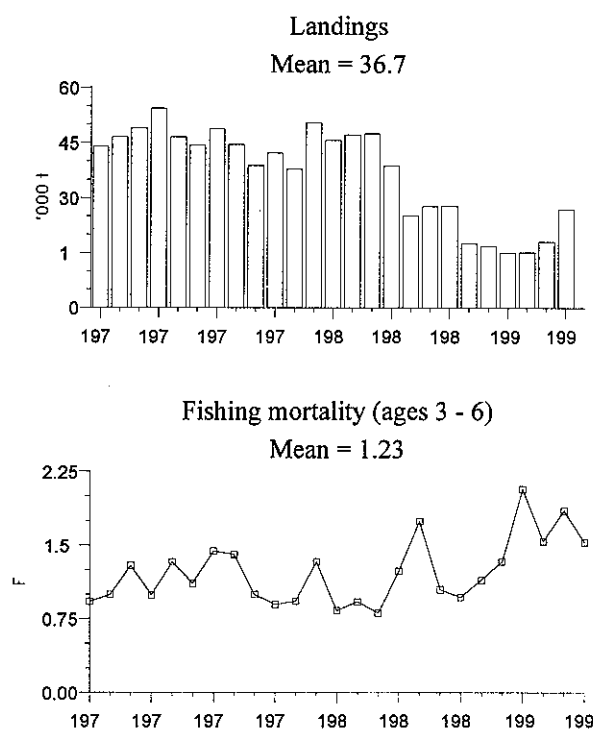
(Details in Table 3.13.5 a.2).

Forecast: Not available. Uncertainties in the data make the estimates of stock size and exploitation level for recent years very variable and not useful for catch predictions.

Management advice for 1995 and 1996: ACFM recommends that fishing effort in 1995 and 1996 be reduced by at least 30% from the 1994 level.

Special comments: Although recent recruitment appears to have resulted in stock increases, the exploitation level is very high and will hamper stock recovery or lead to a rapid stock reduction if future recruitment reverts to the level of the late 1980s. It is not possible to give advice on the basis of a forecast. To enable the stock to recover on a permanent basis effort reduction is necessary.

A reduced effort level does not necessarily mean reduced catches. In the present situation, with improved recruitment to the stock, an effort reduction may be achieved with constant or even increasing catches.



In its advice for 1995 ACFM advised that effort should not be allowed to increase above its recent level. This was based on an indication that the exploitation level in 1992–1993 had decreased relative to former years, and the advice was to maintain this lower level. The indication of a lower exploitation level was, however, based on the uncertain landings data available and the present assessment does not confirm this indication of a lower exploitation level. A reduction in effort is therefore needed to achieve the objectives of the management advice for 1995 given in 1994.

Due to recent uncertainties in catch data it is not possible to advise a catch level which is equivalent to a certain reduction in effort. The advice can therefore only be given in effort terms.

A reduction in effort of 30% relative to the 1994 level is predicted to bring the fishing mortality to the order of the level in the 1970's when there was a stable spawning stock biomass and higher recruitment.

Data and assessment: The data from the commercial fisheries in recent years are rather uncertain. This holds true for both landings, effort and biological data. The results from the catch analysis become imprecise for the most recent years.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

3.13.5.b Cod in Sub-divisions 25-32

Catch data (Table 3.13.5 b.1):

Year	Rec. TAC	Agreed TAC ¹	ACFM catch
1987	245		217
1988	150		194
1989	179	220	179
1990	129	210	154
1991	122	171	122
1992	LPL	100	55
1993	- ²	40	38
1994	25	60	89
1995	- ³	100	

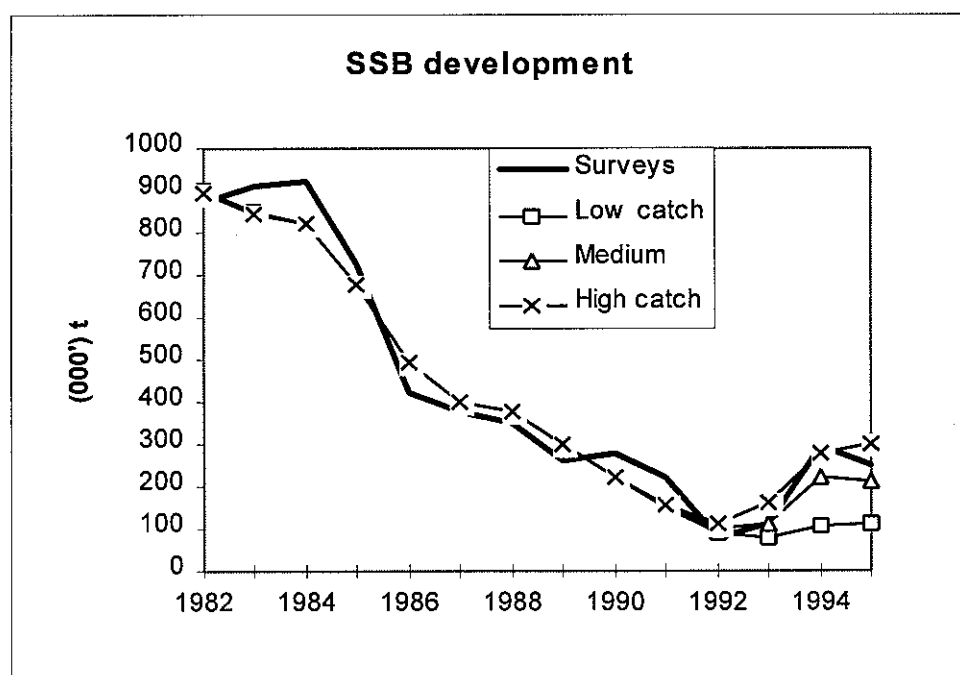
¹For total Baltic. ²No fishing. ³30% reduction in effort. Weights in '000 t.

Historical development of the fishery: The landings increased from about 150,000 t in the late 1970s to around 390,000 t in the early 1980s, but decreased thereafter. The level of landings in recent years (1992–1994) is not precisely known due to incomplete reporting and likely values are considerably higher than official landings. The fisheries developed during the 1970s with more fleets entering in the early 1980s. There has been a shift from trawling to gill netting in recent years with 30–40% of

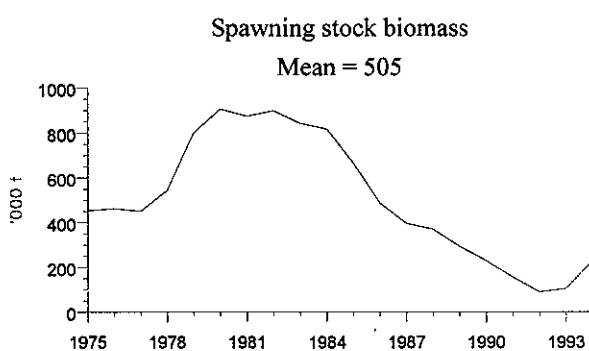
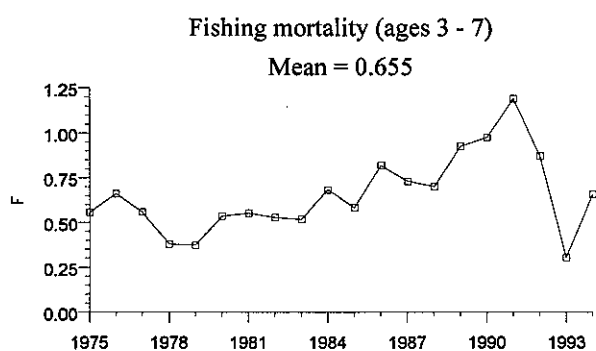
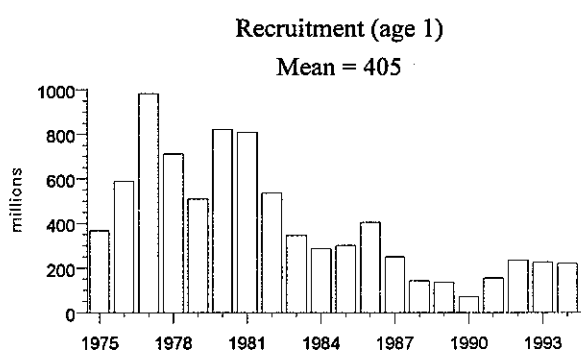
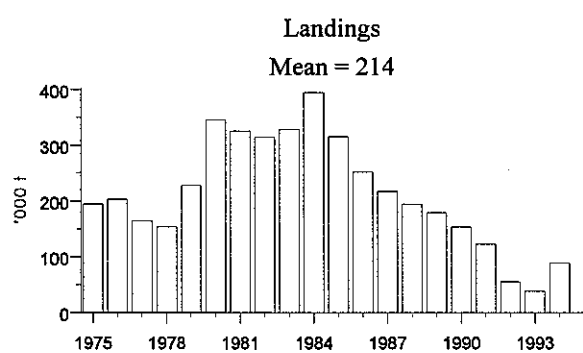
landings currently being taken by gill netters. The extent of unreported landings since 1992 reflects a chaotic situation in the fishery, with problems in enforcing regulations.

State of the stock: ACFM is not in a position to assess the state of the stock precisely. It is considered to be at or outside safe biological limits. The spawning stock declined from a historically high level of around 800,000 t during 1982–1983 to the lowest recorded level in 1992. The spawning stock has been recovering since then, but imprecise landings data render the estimates of present stock size uncertain (see figure below). However, the 1991 and 1993 year classes are more abundant than the sequence of poor year classes in 1987–1990 and are now contributing to an increase in spawning stock biomass. The decrease of the stock was linked to an increase in exploitation to high levels around 1990, but fishing mortality has since stabilized or even decreased. Recent levels of exploitation and SSB cannot be estimated precisely due to uncertainties in landings data.

To illustrate the extent of the problem the recent development in SSB is shown below assuming three levels of catches in 1993 and 1994: one based on official landings (low catch option), one including the ACFM estimate of unreported landings (based on known instances of unreporting, medium catch option) and one assuming a higher level of unreported landings. Details for the medium level of catch are given in Table 3.13.5 b.2.



In the graphs below, the estimates for 1992-1994 are based on the medium level of catch and are uncertain



Forecast: A forecast is strongly dependent on the assumptions made concerning the level of recent landings. Three forecasts have been produced based on low, medium and high catches in 1993 and 1994.

Basis : Fishing mortality : $F(95)$ and $F(96) = F(94)$

Assumption	Assumption of catches, '000 t in year	
	1993	1994
Official landings		
Low	25	50
Medium	38	89
High	70	120

Special comments: In its 1994 report, ACFM found no basis for the provision of advice based on precise estimates of stock size. Last time an analytical assessment was possible the stock was found to be in a depleted state and there was no basis in terms of new data to revise this position. ACFM therefore recommended no fishing in 1995. Independent information from research vessel surveys and commercial vessels now confirms that the stock is recovering from its depleted state. The information does, however, indicate that the spawning stock in 1995 is still below minimum acceptable limits. ACFM therefore continues to advise a precautionary approach to the management of the stock in 1995 but, on the basis of the signs of recovery does not recommend a fishing closure. A common recommendation is given for 1995 and 1996.

It is not possible for ACFM to provide management advice based on precise estimates of stock size due to the large uncertainties in the catch data for 1992-1994. There are indications that the stock size is increasing from its minimum level in 1992 and there have been some year classes at a higher level than in the period up to 1991. The estimates of present spawning stock level, however, may still be below acceptable minimum levels and the precise exploitation level is not known. There is thus still a need to implement a cautious approach if stock recovery is to be ensured.

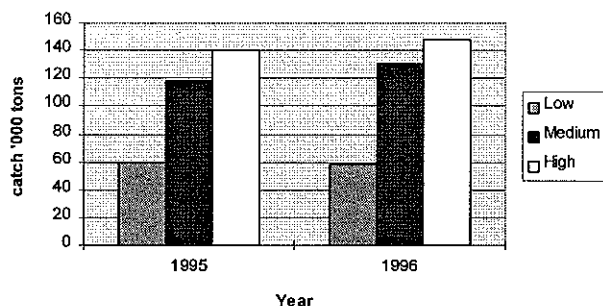
The large uncertainties in recent catch levels are a reflection of the fact that TACs as implemented have been inefficient in reducing the exploitation level on this stock. It is furthermore - due to the same uncertainties - not possible to provide a single forecast of landings to be expected under various exploitation levels. TACs as implemented have thus proved inefficient and a basis for TACs in 1996 cannot be provided.

The advice is therefore given on an effort basis. A reduction in effort of 30% relative to the 1994 level is predicted to bring the fishing mortality to the order of the level before the stock depletion started.

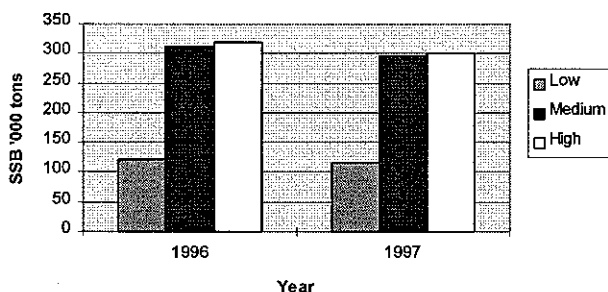
Data and assessment: The information on catches, landings and effort from the commercial fisheries in the years 1992-1994 is regarded as highly unreliable. The results from the catch analysis therefore become imprecise for the most recent years.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

Predicted catch levels



Predicted Spawning Biomass



Management advice for 1995 and 1996: ACFM recommends that fishing effort in 1995 and 1996 be reduced by at least 30% from the 1994 level.

3.13.5.c Mesh considerations for cod in the Baltic

The IBSFC requested ICES to provide, for cod stocks, advice on appropriate mesh sizes in exit windows installed in cod-ends of cod trawls with 105 mm cod-end and in cod-ends with standard diamond-meshes corresponding to an L50 of 38 cm. The two designs of exit windows (Model 1, the Swedish design and Model 2, the Danish design) are described in the Proceedings of the Twentieth Session of the IBSFC, pp. 327–332.

To answer the request seven sets of data based on 54 hauls covering these designs and standard diamond-mesh cod-ends have been examined. The conclusions are as follows:

a) Danish design of window cod-end (Model 2)

A very limited data set suggests that, in a 107 mm diamond-mesh cod-end, a window mesh size of 121 mm (95% confidence interval 117–135 mm) is required to achieve an L50 of 38 cm.

b) Swedish design of window cod-end (Model 1)

No specific advice is given on the mesh size required in a Swedish design of window fitted in a 107 mm diamond mesh cod-end in order to achieve an L50 of 38 cm. It is likely that the required window mesh size will be greater than 105 mm.

c) Conventional diamond-mesh cod-end.

A limited data set suggests that a mesh size of 125 mm (95% confidence interval 119–132 mm) is required to achieve an L50 of 38 cm in a diamond mesh cod-end.

According to this analysis, the current IBSFC mesh size regulations do not correspond to an L50 of 38 cm.

Source of information: Report of the Fishing Technology and Fish Behaviour Working Group, April 1995 (C.M.1995/B:2).

3.13.6 Flounder

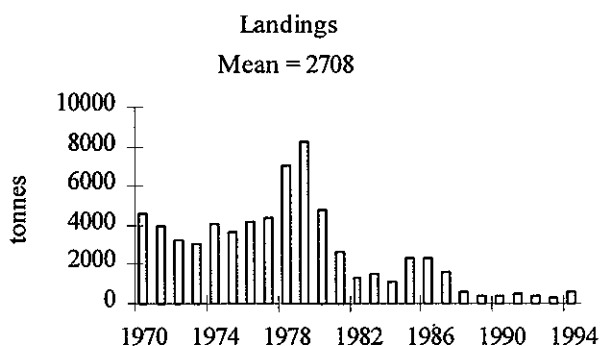
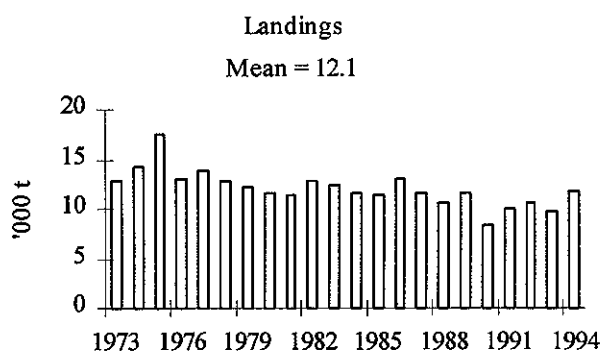
Flounder is mainly taken as a by-catch in cod fisheries but directed trawl fisheries are found as well. The total catch of flounder has remained stable for about 20 years (Table 3.13.6.1) with the majority of catches being taken in Sub-divisions 22–25. There has, however, been some change between areas with decreasing catches in the eastern (Sub-divisions 26–32) part of the Baltic. There are not sufficient data available to present analytical assessments and catch forecasts. Indications from analysis of the catch and survey data available are that the stock is moderately exploited and that the stock size is stable or slightly increasing in the eastern part of the Baltic.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic Stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

3.13.7 Plaice

Sub-divisions 22–24 are the most important areas for the plaice fishery in the Baltic. The total catches of plaice (Table 3.13.7.1) were high in the 1970's but have decreased since the early 1980's. Catches are now at 10–15% of the level in the 1970's.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic Stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).



3.13.8 Dab

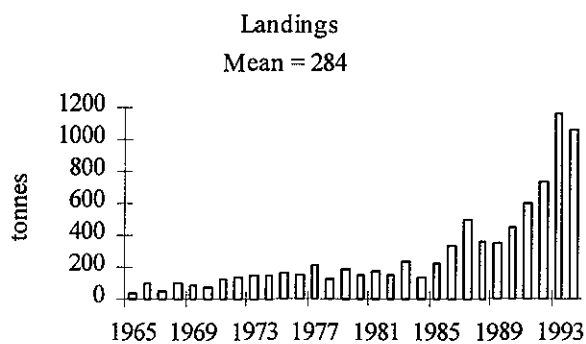
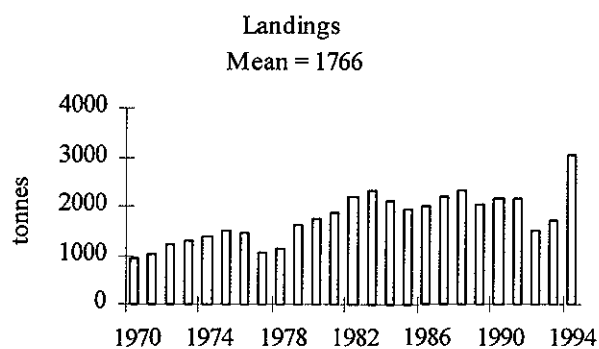
The total catches of dab (Table 3.13.8.1) were rather stable around 2,000 t per year in the 1980s and up to 1993. The catches in 1994 increased to 3,000 t. The majority of the catches are taken in Sub-division 22.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic Stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).

3.13.9 Turbot

The total catches of turbot in the Baltic (Table 3.13.9.1) have been increasing since 1984 to a level above 1,000 t in 1993–1994. A directed gill net fishery is developing in Sub-division 25.

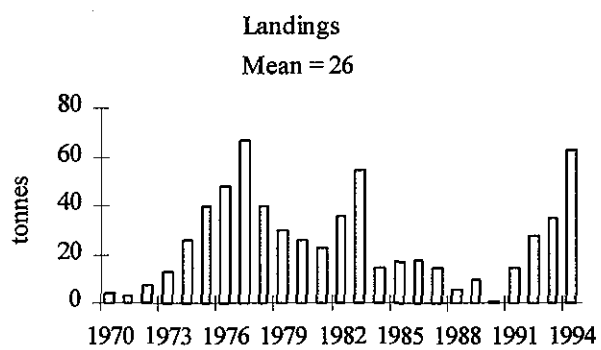
Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic Stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).



3.13.10 Brill

The catches of brill are presented in Table 3.13.10.1. There are gaps in information and the total catch figures are preliminary.

Source of information: Report of the Working Group on the Assessment of Demersal and Pelagic Stocks in the Baltic, April 1995 (C.M. 1995/Assess:18).



3.13.11 Salmon and Sea Trout

3.13.11.a Overview

Salmon

Naturally reproducing salmon stocks exist in about 30 rivers in the Baltic area. An estimate of the smolt run in 1994 suggests that approximately 0.6 million wild smolts migrated. This is a small improvement compared to the smolt run in 1993 but current estimates for 1995 and 1996 are much lower. Many rivers have been dammed and spawning and nursery areas have disappeared. To compensate, hatcheries have been built on these rivers and reared stocks are released. Normally these fish feed in the sea and migrate back to rivers as spawners where they are taken and used for broodstocks. The fish are reared in the hatchery to the smolt stage and released. However, in Finland hatchery-reared stocks are kept in hatcheries for their entire life span and are used as broodstock. The broodstock is genetically strengthened by using some spawning fish returning from the sea. The application of this method has also been initiated in Sweden due to the current problem with M74. A total of 4.8 million hatchery-reared smolts were released in rivers and at coastal release sites in 1994.

While feeding in the sea, salmon are caught by drift nets and long lines, while, during the spawning run, they are caught along the coast mainly in trap nets. In the river mouths set gill nets and trap nets are used and there is a traditional recreational angling fishery in the rivers and a trolling fishery occurs in coastal areas. The offshore fishery and most of the coastal fisheries exploit both wild and reared salmon. Wild salmon cannot be easily distinguished from reared fish and therefore it is only possible to exploit reared fish separately during the homing migration when salmon approach their release sites near river mouths. Total annual catches of reared and wild salmon by country and area are given in Table 3.13.11a.1.

Status of stocks

Wild salmon stocks in the Gulf of Bothnia are considered to be outside safe biological limits. At present only 12 of the original 44 wild salmon stocks in the rivers discharging into the Gulf of Bothnia remain in existence. In the Gulf of Finland only six stocks remain and in the Main Basin, 12 stocks remain. The estimated production of wild smolts in the Gulf of Bothnia decreased from 455,000 in 1994 to 204,000 in 1995 and 84,000 in 1996. Production in the Gulf of Finland and in the Main Basin has also declined.

The salmon stocks in the Main Basin are in better state than those in the Gulf of Bothnia and Gulf of Finland. The sharp reduction in parr production since 1994 indicates that the gradual increase in the stocks in recent years will not continue and the stocks are likely to decline. The smallest stocks are at risk of extinction but the larger stocks and those in the Main Basin are not so sensitive to temporal

variations in the size of the spawning stock. The continued existence of these small Main Basin stocks has probably been possible because they are not as heavily exploited by the coastal fishery as the Gulf of Bothnia stocks and because river fisheries have not been permitted on these stocks. The combination of decreased spawning stock and low survival of fry may result in total extinction of new salmon generations in the rivers currently supporting naturally reproducing stocks.

Management

ACFM recommends that in order to safeguard the wild stocks, the offshore and coastal fisheries should be closed in 1996. If fishing is permitted, the catch should be as close to zero as possible.

Reared fish should be harvested close to their points of release where this can be achieved without fishing wild fish (i.e. in the mouths of rivers which support no wild stocks and at certain coastal release sites).

Sea trout

Most of the sea trout stocks in the Baltic make a short migration into coastal waters but Polish stocks and some Swedish stocks in the Main Basin migrate into the offshore areas. Coastal stocks are mainly taken in directed fisheries using anchored floating nets or traps. The stocks entering the offshore area are exploited by salmon drift netting and long lining. Sea trout is important for the recreational fishery in coastal areas and rivers.

Status of stocks

Naturally reproducing sea trout stocks exist in at least 250 rivers and brooks. Stocks in at least 24 rivers are in good condition with parr densities at optimal levels. The stocks in the Gulf of Bothnia, particularly in Sub-division 31, are in a poor state. Several of these stocks are probably overexploited to the extent that they now mainly exist as non-migratory brown trout populations which produce some seaward migrating smolts. A rough estimate of the wild production is around 0.5 million smolts taking into account that there are a number of stocks that have not been surveyed.

Hatchery-reared smolt production, including enhancement is stable at a level of 2.6 million and much of the sea trout is based on smolt releases. Sea trout does not seem to be affected by M74.

Management

The stocks remaining in coastal waters are only exploited in local fisheries and should therefore be managed on a national or local basis. The stocks moving into offshore areas would benefit from any restriction on the salmon fisheries.

3.13.11 Salmon

3.13.11.b Salmon in the Main Basin and the Gulf of Bothnia (Sub-divisions 24-31)

Catch data (Table 3.13.11a.1):

TACs

Year	Rec TAC '000 t	Rec TAC '000 fish	Agreed TAC ¹ '000 t	Agreed TAC ¹ '000 fish
1987				
1988	<3.00			
1989	2.90			
1990	1.68			
1991	- ²	- ²	3.35	
1992		688	3.35	
1993		500 ³		650
1994		500 ³		600
1995		- ⁴		500

Landings

Year	Coast & rivers '000 t	Off- shore '000 t	Coast & offshore ⁵ '000 t	'000 fish ⁶	Total '000 t	'000 fish ⁶
1987	0.43	3.21	3.59	891	3.64	897
1988	0.47	2.43	2.85	784	2.90	791
1989	0.73	3.27	3.92	1035	4.00	1049
1990	1.42	3.65	4.96	1113	5.07	1131
1991	1.14	3.00	4.03	757	4.14	775
1992	1.34	2.66	3.90	710	4.01	726
1993	0.94	2.55	3.39	642	3.49	656
1994 ⁷	0.65	2.19	2.74	579	2.84	594

¹TAC does not include river catch. ²TAC much below present levels. ³Equivalent to 2.25-2.70 thousand t. ⁴No exploitation of wild salmon. ⁵For comparison with TAC. ⁶Catch in numbers before 1993 based on estimates. ⁷Preliminary data, Lithuanian and Russian catches not included.

Historical development of the fishery: The salmon fishery in the Baltic is mainly based on reared fish. The salmon are exploited in offshore areas during their feeding migration by longlining and drift net fleets and in coastal areas on their return run by traps and nets. A traditional recreational fishery occurs in coastal areas and in rivers. The landings in both the offshore fishery and the coastal and river fisheries peaked in 1990 and have since declined. The largest catches are taken in the offshore fisheries in the Main Basin and in the Gulf of Bothnia. The proportion of the total catch taken by the coastal and river fisheries increased in 1990, but subsequently reverted towards a higher proportion being taken by the offshore fishery. The increasing numbers of salmon caught in fishing gear which are eaten by seals constitute an increasing unreported mortality and may in some areas be 10-30% of the reported catch.

The wild salmon populations are at extremely low levels and in recent years reared fish have constituted about 90% of the catch. This makes the management of the fishery difficult as wild fish cannot easily be distinguished from reared fish. The only fisheries that do not exploit wild salmon are those in rivers and to a lesser extent in the mouth areas of rivers which do not support wild stocks.

There has been a single TAC in operation for all the marine fisheries (rivers excluded) for salmon since 1991. Until 1992 the TAC was expressed in weight and subsequently it has been expressed in numbers of fish.

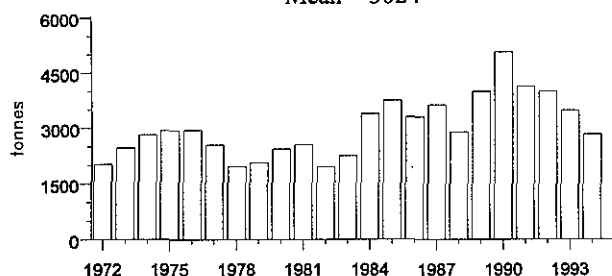
State of stocks: Salmon smolt production in the Gulf of Bothnia and Baltic Main Basin are shown below (in millions):

Year	Wild ¹	Reared	Total
1987	0.41	5.56	5.97
1988	0.40	5.68	6.08
1989	0.41	5.23	5.64
1990	0.41	4.39	4.80
1991	0.41	4.09	4.50
1992	0.45	4.71	5.16
1993	0.49	5.37	5.86
1994	0.62	3.95	4.57
1995 ²	0.32	4.25	4.57

¹Older data on wild smolt production mainly guesses, now to a larger extent based on annual surveys. Smolt production measured only for rivers Tornionjoki and Simojoki (10-30% of total production). ²Preliminary data.

Wild stocks: At present only 12 of the original 44 wild salmon stocks in rivers discharging into the Gulf of Bothnia remain in existence. These stocks are considered to be outside safe biological limits. However, in the Main Basin the situation is somewhat better and some of the stocks are within safe biological limits. The production of wild salmon has been below optimal levels for many years.

Landings
Mean = 3024



Preliminary data suggest that the production of wild smolts will further decrease in 1995 and 1996 to record low levels. The improved runs that have been seen in recent years in some rivers are not expected to be maintained. The M74 syndrome is affecting the wild spawning stocks in Swedish and Finnish rivers thereby contributing to the severe decline in numbers of wild parr.

The combined effect of low survival of eggs/fry and the expected decrease in the spawning stocks will increase the risk of extinction of wild salmon in several rivers, particularly the smaller stocks producing only some hundreds or thousands of smolts annually.

Detailed data on the historical development of Latvian salmon stocks are not available, but recent parr surveys suggest that the stocks are not depleted. It is not clear to what extent these stocks are affected by M74.

Reared stocks: The production of reared salmon smolts has been about 5 million for several years. The existence of M74 in Swedish broodstocks is reducing production in Sweden 1994-95 but probably not in 1996. Reared smolt production in other countries may decrease slightly for other reasons. Reared smolt production in Latvia is not influenced by M74 to any great extent.

Forecast for 1996: Wild stocks: Surveys of juvenile salmon around the Baltic suggest that the wild smolt runs in 1994 were the highest for many years but this production was only approximately 20 % of the estimated maximal production. The current low densities of parr in Finnish and Swedish rivers suggest that the production in these rivers will decrease in 1995 and 1996. This will result in a significant reduction in returns of adult wild salmon beginning in 1997.

Reared stocks: The forecast production of reared smolts in 1995 is 4.25 million smolts. Reared production is reduced by M74 in some countries and this will result in a reduction in stocks of reared adult salmon in 1996-97.

In accordance with the request for advice, catch options are given for 1996. The prediction model used represents the average situation for the Baltic salmon fishery in 1986-1992 including a smolt production of 5.2 million. In addition predictions are made based on the smolt production in 1993 and 1994.

Simulations based on average smolt production in 1986-1992

The base run represents an average year without effects of M74 and the following three runs simulate three alternative management scenarios assuming the same smolt production.

Run 1. Base run.

The text table below shows the calculated escapement in numbers and in percentage of the recruitment (in parentheses) together with the catch in numbers and in weight. The results are presented by area. The results represent the equilibrium situation when the releases and mortality are constant over several years.

Area	Escapement (No)	Catch (No)	Yield (t)
Swedish Northern Rivers	7,174 (0.36%)	22,389	83
Swedish Northern coast (Sub-divs. 30-31)		52,547	252
Gulf of Bothnia and Main Basin (Open Sea Sub-divs. 24-31)		603,900	2,566
Finnish Northern Rivers	7,868 (0.43%)	17,764	79
Finnish Northern Coast Sub-div. 31		47,035	149
Finnish Northern Coast Sub-div. 30		27,413	100
Latvian Rivers	19,403 (2.16%)	0	0
Eastern Baltic Coast (Sub-divs. 25-29)		8,512	54
Swedish Southern Rivers	6,324 (1.26%)	13,457	74
Total (excl. river catches)	40,770 (0.78%)	742,116	3,120

Run 2. Closing the open sea (Sub-divisions 24-31) driftnet and hook and line fishery.

It has been argued that a better utilization of the reared stocks would be achieved if the fisheries in the open sea were closed and salmon were harvested in the coastal fisheries only. This scenario is presented below:

Area	Escapement (No)	Catch (No)	Yield (t)
Swedish Northern Rivers	29,110 (1.46%)	52,335	355
Swedish Northern coast (Sub-divs. 30-31)		152,821	1148
Gulf of Bothnia and Main Basin (Open Sea Sub-divs. 24-31)		0	0
Finnish Northern Rivers	29,179 (1.62%)	43,932	308
Finnish Northern Coast Sub-div. 31		136,512	704
Finnish Northern Coast Sub-div. 30		122,559	705
Latvian Rivers	88,044 (9.78%)		0
Eastern Baltic Coast (Sub-divs. 25-29)		30,160	337
Swedish Southern River	23,097 (4.62%)	37,903	342
Total (excl. river catches)	169,430 (3.26%)	452,036	2,893

This will increase catch (including river catches) (in weight) by approximately 16% and escapement by about 400%. The estimated escapement, however, may not be sufficient to safeguard wild stocks in 1996. The forecast escapement would be even lower in 1997 than in 1996.

Run 3. Closing the coastal fisheries in Sub-divisions 30 and 31, all other fisheries unchanged.

Coastal fisheries show high exploitation rates and an evaluation was performed to determine if closure of these fisheries would improve escapement. This scenario is presented below.

Area	Escapemen t (No)	Catch (No)	Yield (t)
Swedish Northern Rivers	25,297 (1.26%)	56,265	256
Swedish Northern coast (Sub-divs. 30-31)		0	0
Gulf of Bothnia and Main Basin (Open Sea Sub-divs. 24-31)		603,900	2,566
Finnish Northern Rivers	22,768 (1.26%)	48,446	230
Finnish Northern Coast Sub-div. 31		0	0
Finnish Northern Coast Sub-div. 30		0	0
Latvian Rivers	19,403 (2.16%)	0	0
Eastern Baltic Coasts Sub-divs. 25-29)		8,512	55
Swedish Southern River	6,324 (1.26%)	13,457	74
Total (excl. river catches)	73,792 (1.41%)	612,412	2,620

According to this scenario the closure will improve escapement. The loss in catch to the coastal fisheries will not be offset by the river catches since the exploitation levels in the coastal fisheries are well above those in the rivers. This option gave a total yield of 3180 t, slightly below the base run of 3356 t.

Simulations based on smolt production in 1993–1994

The following four runs were performed on the basis of the catch pattern of the late 1980s and early 1990s taking into account the changes in recruitment, i.e. lower smolt production in 1993–1994.

1) Status quo prediction

Area	Estimated escapement wild salmon	Estimated escapement reared salmon
Swedish Northern Rivers	760	6,810
Finnish Northern Rivers	790	7,080
Latvian Rivers	1,690	15,210
Swedish Southern Rivers	200	1,840
Total	3,440	30,940

Total catch in number of wild and reared salmon	702,000
Total catch in weight of wild and reared salmon	2,960 t

2) Closure of all fisheries including river fisheries in 1996

This projection is presented for comparison with the scenario presented above but allows escapement under a complete closure including river catches while maintaining releases. This scenario represents the option when the management objective is to safeguard wild salmon.

Area	Estimated escapement wild salmon	Estimated escapement reared salmon
Swedish Northern Rivers	32,530	292,780
Finnish Northern Rivers	22,030	198,250
Latvian Rivers	10,620	95,540
Swedish Southern Rivers	2,280	20,490
Total	67,460	607,060

Total catch in number of wild and reared salmon	0
Total catch in weight of wild and reared salmon	0 t

Significantly improved escapement will occur in 1996 but escapement will be less in 1997 due to the expected reduction in natural production of wild smolts in 1995 and 1996.

3) Closure of coastal and offshore fisheries in 1996

Projections which assume the same survival rate for wild and reared salmon, but maintain the releases at the 1994 level are presented below:

Area	Estimated escapement wild salmon	Estimated escapement reared salmon
Swedish Northern Rivers	12,980	116,780
Finnish Northern Rivers	9,200	82,760
Latvian Rivers	10,620	95,540
Swedish Southern Rivers	930	8,330
Total	33,730	303,410

Total catch in number of wild and reared salmon	337,000
Total catch in weight of wild and reared salmon	2,650 t

4) Closure of offshore fisheries in 1996

Area	Estimated escapement wild salmon	Estimated escapement reared salmon
Swedish Northern Rivers	2,140	19,220
Finnish Northern Rivers	2,830	25,510
Latvian Rivers	8,140	73,290
Swedish Southern Rivers	930	8,330
Total	14,040	126,350

Total catch in number of wild and reared salmon	528,000
Total catch in weight of wild and reared salmon	3,495 t

The results in number of fish escaping to the various runs are to some extent dependent on the assumption of a constant fishing pattern, natural mortality and initial smolt survival, but the results are robust for internal comparison and indicate the relative effects that could be expected of alternative management actions.

Summary of alternative strategies

Under both sets of smolt production conditions, the option which close all fisheries, including the rivers, results in the highest escapement of salmon. Further, the option which closes the coastal and offshore fisheries produces slightly lower yield in tonnes than the *status quo* option, but the number of salmon caught is significantly less than under the *status quo* option (337,000 vs 702,000 salmon under 1993–1994 recruitment conditions). The closure of offshore and coastal fisheries results in significantly greater escapement than the *status quo* option.

Management advice: ACFM recommends that in order to safeguard the wild stocks, the offshore and coastal fisheries should be closed in 1996. If fishing is permitted, the catch should be as close to zero as possible.

Reared fish should be harvested close to their points of release where this can be achieved without fishing wild fish (i.e. in the mouths of rivers which support no wild stocks and at certain coastal release sites).

Special comments: M74 caused high mortalities among the offspring of sea-run females in 1992-94 and will do so according to prognoses in 1995. Thus the risk that more of the wild Baltic salmon stocks may become extinct can only

be reduced by major changes in the current management policy. It is vitally important that as many wild fish as possible are allowed to spawn in order to maintain a reasonable level of juvenile salmon production and redress the current situation of critically low juvenile numbers. Because current information suggests that the state of Latvian wild salmon stocks is relatively good, a fishery of the present magnitude may be allowed in the Gulf of Riga. However, intensified annual surveys of the wild stocks are necessary to justify the continued operation of these fisheries.

Because of the M74 outbreak, the assessment of wild stocks has become increasingly dependent on monitoring the status of wild stocks in different rivers. At the same time the large annual variation in mortality of smolts when leaving the rivers is an additional source of variation.

Data and assessment: Area and temporal assessment based on age-disaggregated catch data and tagging data. Estimates of wild smolt production are available for each region, but many estimates are based on limited surveys.

Source of information: Report of the Baltic Salmon and Trout Assessment Working Group, April 1995 (C.M.1995/Assess: 16.).

3.13.11.c. Salmon in the Gulf of Finland (Sub-division 32)

Catch data (Table 3.13.11a.1):

TACs

Year	Rec TAC	Agreed TAC	
	'000 fish	'000 t	'000 fish
1987			
1988			
1989			
1990			
1991		0.43	
1992		0.43	
1993	109 ¹		109
1994	65 ²		120
1995	- ⁴		120

Landings

Year	Coast & Rivers	Off- shore	Coast & off- shore		Total	
	'000 t	'000 t	'000 t	'000 fish	'000 t	'000 fish
1987	0.06	0.29	0.35	140	0.35	141
1988	0.11	0.16	0.27	74	0.27	74
1989	0.15	0.25	0.40	105	0.40	106
1990	0.40	0.18	0.55	116	0.57	117
1991	0.42	0.19	0.59	121	0.62	122
1992	0.42	0.11	0.53	74	0.53	74
1993	0.31	0.13	0.44	-	0.44	-
1994 ³	0.16	0.09	0.25	-	0.25	-

¹Reared stock only; equivalent of 600 t. ²Reared stock only; equivalent of 400 t. ³Preliminary data, Russian catch missing. ⁴No exploitation of wild fish.

Historical development of the fishery: From the 1950s to the 1970s there was a small offshore long-line fishery in the Gulf of Finland based on wild salmon production and

releases of reared smolts in the former USSR. With the growth of smolt-rearing programmes in Finland in the 1980s this fishery expanded and a coastal trap net fishery developed.

A TAC was introduced in 1991. In 1993 and 1994, the TACs were 109 and 120 thousand fish respectively. The latter figure was approximately twice the recommended figure.

State of stocks: Salmon smolt production in the Gulf of Finland is shown below (in thousands):

Smolt production:

Year	Wild ¹	Reared	Total
1987	15	593	608
1988	15	569	584
1989	15	432	447
1990	15	573	588
1991	15	501	516
1992	15	415	430
1993	15	421	436
1994	15	508	548 ³
1995 ²	7	535	553 ⁴

¹Data on wild smolt production assumed until 1994. 1995 figures based on surveys. ²Preliminary data. ³Including enhancement 25,000 smolts. ⁴Including enhancement 11,000 smolts.

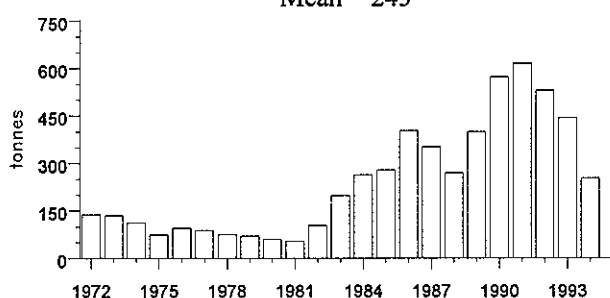
Wild stocks: There are thought to be wild salmon stocks in six rivers in the Gulf of Finland, but information on these is very limited. Surveys have shown that parr occur in five rivers examined.

Reared stocks: Hatchery production in the Finnish rearing programme has been stable at around 400,000 smolts annually. This production is supported by hatchery broodstock, but every second or third year some sea-run fish are added to the broodstock. In 1994, as in previous years, offspring from sea-run females had a high mortality due to M74.

Forecast for 1996: *Wild stocks:* The estimated smolt production in 1995 was reduced from the previous assumed level on the basis of low densities in surveys in 1994. The most recent estimate of wild production of 7,000 smolt, represents less than 2 percent of the wild and reared smolt production. It is probable that wild stocks are severely depleted and some may be close to extinction.

Reared stocks: The smolt production in the Finnish programme increased to 500,000 in 1994 and it is expected to be at the same level in 1995.

Landings
Mean = 243



ACFM was not in a position to estimate directly the effect on yield and escapement of closing the offshore fishery, closing all fisheries or only maintaining fishing in rivers. Based on the conclusion of the analysis of the effects in the Main Basin and Gulf of Bothnia it can, however, be concluded that:

- If the objective is to optimize the yield most of the catches should be taken in rivers or at point of release and the offshore fishery should be closed.
- If the objective is to safeguard wild stocks, all fisheries harvesting salmon of mixed origin should be closed in 1996 including rivers where wild salmon occur. Reared fish should only be caught close to their points of release in rivers, rivers mouths and at coastal release sites, if catches of wild salmon can be avoided.
- The *status quo* projection for Sub-division 32 gives a catch prediction for 1995 of 306 t and 67,000 fish. This is 55.8% of the agreed TAC. The *status quo* catch prediction for 1996 is 329 t and 69,000 fish.

Management advice: ACFM recommends that in order to safeguard the wild stocks, the offshore and coastal fisheries should be closed in 1996. If fishing is permitted, the catch should be as close to zero as possible.

Reared fish should be harvested closed to their points of release where this can be achieved without fishing wild fish (i.e. in the mouths of rivers which support no wild stocks and at certain coastal release sites).

Special comments: M74 caused high mortalities among offspring from sea-run females in Finnish hatcheries in 1992-94 and will probably also do so in 1995.

Surveys should be undertaken to improve the data on occurrence of wild stocks in this region. No data are available on the current status of salmon stocks in the area of the Russian Federation.

Data and assessment: Analytic assessment based on catch at age estimated from tag recoveries. Recruitment of smolts from reared salmon and estimates of wild production based on limited surveys not including all rivers.

Source of information: Report of the Baltic Salmon and Trout Assessment Working Group, April 1995 (C.M.1995/Assess: 16).

3.13.11.d Requests from IBSFC

Following the 1994 IBSFC meeting, a number of specific requests for advice was received. These are dealt with in sequence below.

Advice on catch options for 1996 (in numbers of fish) for salmon by gear and by sub-divisions with the objectives to:

- i optimize utilization of reared salmon stocks;
- ii safeguard the wild stocks and the genetic diversity of Baltic salmon;
- iii maintain the current level and pattern of fishery in 1996.

Under both sets of conditions, the options which close all fisheries, including the rivers, result in the highest escapement of salmon. Further, the option which closes the coastal and offshore fisheries produces slightly lower yield in tonnes than the *status quo* option, but the number of salmon caught is significantly less than under the *status quo* option (337,000 vs 702,000 salmon under 1993–1994 recruitment conditions). The closure of offshore and coastal fisheries results in significantly greater escapement than the *status quo*.

This request is addressed in more detail in the appropriate parts of Section 3.13.11.b.

Advice on appropriate measures to increase escapement of wild salmon such as boundaries of the terminal fishing areas for reared fish and opening dates for the coastal fisheries by sub-divisions:

Terminal fishing areas for reared fish

The results of studies carried out in the northernmost part of the Gulf of Bothnia indicate that fishing in the river mouth is more stock specific than elsewhere. However, in this area, where rivers supporting wild stocks and closed rivers with continuous smolt releases are situated within a coastline no longer than 100 km, no pure stock specific fishery could be found. Salmon of wild and hatchery-reared origin enter the same area and wait for suitable environmental conditions to enter the rivers. In this special case either a fishery could be conducted in the rivers to exploit stock specific salmon or a coastal fishery with an opening date sufficiently late to allow the wild salmon to have entered the rivers could be operated.

In the hatchery-release areas (including coastal release sites) where there are no rivers supporting wild salmon stocks, terminal fishing areas can be established to account for the migration route of wild salmon and the timing of the

migration. At present insufficient studies have been carried out to determine possible terminal fishing areas.

Opening dates in the coastal fisheries

In the Gulf of Bothnia most salmon stocks are located in the northern part of the Gulf. Results of tagging experiments have shown that the main migration routes enter the Gulf west of the Åland Islands and then follow the Finnish coast as far as Northern Quarc. From there Swedish stocks move to the west coast of the Gulf. Swedish Bothnian Sea stocks migrate south along the west coast and Bothnian Bay stocks move northwards along the west coast of the Bothnian Bay.

Tag recovery data of wild and hatchery-reared salmon from Gulf of Bothnia tagging, excluding Neva-salmon in the Bothnian Sea, were used to estimate the date when migration of northern salmon occurs in the southern areas. Based on cumulative tag recoveries from April to September inclusive (Figure 3.13.11.d), the dates when a fishery no longer affects reproductive value of salmon migrating to the Bothnian Bay are as follows:

Sub-division 29: late run years - beginning of July;
normal years - middle of June.

Sub-division 30: late run years - end of July; normal
years - middle of July.

Sub-division 31: late run years - end of August;
normal years - end of July.

These results are based mainly on hatchery-reared salmon released into the northernmost part of the Gulf of Bothnia.

Salmon of wild origin migrate about 5-10 days earlier than hatchery-reared fish. The dates given for Sub-divisions 29 and 30 are therefore late enough to allow wild salmon to pass through the area. In the Bothnian Bay wild salmon begin to enter the rivers in June and, by the end of June, most wild salmon excluding grilse have entered the rivers. No salmon fishery should be allowed in the mouths of these rivers that support wild stocks.

In the coastal fishery carried out along the northern coast of the Gulf of Finland, no exploitation of wild stocks (Sub-division 32) has been detected.

In the Main Basin area excluding Sub-division 29N no information is available on the timing of the salmon run in southern Swedish, Latvian, Lithuanian or Estonian rivers.

Advice on establishment of closed areas and closed seasons in the river mouths and rivers supporting wild salmon stocks:

The coastal fishery has been regulated by establishing boundaries for area-based fishing regulations. Protected

areas can be found in the mouths of Swedish and Finnish rivers having wild salmon stocks. The area and shape of the closed areas greatly depends on the topography and hydrographic details of the river mouth. Therefore no common rules on how to establish closed areas in the river mouths can be given. Closed seasons have been discussed above in connection with terminal fishing areas.

Advice on the change of summer closure in Sub-division 29N similar to that applied in the Gulf of Finland and its effect on the proportion of wild salmon in the catches:

Sub-division 29N is the most important migration route of salmon from the Main Basin to the Gulf of Bothnia. Fishing in this area is carried out by trapnets in the coastal area and by drift nets offshore and along the Åland coast. These fisheries are carried out in spring and early summer and mainly exploit salmon during their spawning run to the Gulf of Bothnia. Later in the summer, salmon in Sub-division 29N mainly originate from hatchery releases from Åland.

Wild salmon and older females migrate earlier than hatchery-reared and younger salmon. When the salmon run occurs during its normal season or earlier, extending the fishing season should therefore not increase the exploitation of wild salmon. However, when the run takes place later than "normal" an extension of the fishing season may lead to increased exploitation of migrating salmon of wild origin.

The potential increase in exploitation of wild salmon stocks by advancing the present closing date of 15 June to 1 July was estimated. Tag recovery data of wild and hatchery-reared salmon from Gulf of Bothnia tagging, excluding Neva-salmon in the Bothnian Sea, were used to estimate the impact of the extended fishing season on Gulf of Bothnia salmon migrating through the area. Cumulative tag

recoveries from April to September inclusive, indicate that, in 1992 and 1993, almost 100% of the catch and reproductive value of salmon had been taken by 15 June, but in 1987 only 40% of the reproductive value and 30% of the catch had been taken (Figure 3.13.11.d).

Predation by seals on salmon in fishing gears in Sub-division 29N.

Predation by seals on salmon in fishing gear has increased. Salmon caught in fishing gears and eaten by seals constitute an increasing unreported mortality and may in some areas represent 10 - 30 % of the reported catches. In the past, attempts have been made to make "seals" gear by using different kinds of sound. Such experiments have been largely unsuccessful and experience from the British Isles indicates that seals, after a period of time, recognize the sound and become attracted. Changes to the fishing gear such as trap nets by increasing the size of the fish house or strengthening the net may reduce the effect of seals but efficient methods of reducing damage are not available at present.

Evaluation of results from delayed releases.

Delayed release of salmon has proved to be successful in terms of yield in Swedish, but not in Finnish experiments. The Swedish release sites were close to the feeding area and the choice of release sites appears to be important in this respect. The localization of release sites is also critical for the number of fish straying to other rivers. The present experiments suggest that delayed release could be successful, but efficient fisheries in the release area have to be established to prevent unacceptable straying and reduce the risk of genetic contamination. These criteria will in the present situation, when the wild stocks are to be safeguarded, reduce the number of possible release sites and thus limit the use of this method.

3.13.12 Sea trout

Catch data (Table 3.13.12.1):

Year	Baltic Main Basin	Gulf of Bothnia	Gulf of Finland	Total
1987	319	150	184	653
1988	331	282	290	903
1989	460	331	298	1089
1990	794	432	337	1563
1991	613	463	297	1373
1992	611	469	322	1402
1993	901	250	718	1869
1994 ¹	769	198	648	1615

¹Preliminary data. Weight in t.

Historical Development of the fishery: Sea trout stocks in the Baltic exhibit two types of migration pattern. Most of the stocks migrate in the coastal area within about 200 km of the point of release, but particularly those from Poland and a few from southern Sweden move further into offshore areas. The fish that migrate only short distances are mainly exploited in coastal and river fisheries, while those that migrate offshore are also taken as a by-catch in the offshore salmon fishery.

The exploitation pattern is rather variable in different areas. In Sub-division 31, Gulf of Bothnia, sea trout are to a large extent caught in gill nets for whitefish and to a minor extent in a recreational fishery using nets or in trap nets. Sea trout from stocks that migrate into the offshore areas in the Main Basin are exposed to gears used in the salmon fishery, but they are on the other hand able to avoid coastal gears which may catch them at smaller sizes than the offshore gear do.

State of stocks: *Wild stocks:* Currently at least 250 rivers in the Baltic support wild stocks of sea trout. There are no estimates of the original number of sea trout stocks or the current level of natural smolt production. However, stocks

in several rivers in the Main Basin are thought to be in good condition with nursery areas well utilized. The stocks in the Gulf of Bothnia, particularly in Sub-division 31, are in a poor state. Several of these stocks are probably overexploited to the extent that they now mainly exist as non-migratory brown trout populations which produce some sea trout smolts.

Reared stocks: Sea trout smolt production is shown below (in thousands):

Year	Baltic Main Basin	Gulf of Bothnia	Gulf of Finland	Total
1987	994	1081	358	2433
1988	1312	1083	226	2621
1989	1537	906	198	2641
1990	1237	1035	237	2509
1991	665	1186	259	2110
1992	1023	1247	314	2584
1993	1576	1171	251	2998
1994	1485	985	285	2755
1995 ¹	2058	1225	300	3583

¹Preliminary data.

Hatchery production in the Main Basin has increased in recent years, while the smolt production in the Gulf of Bothnia has been rather stable.

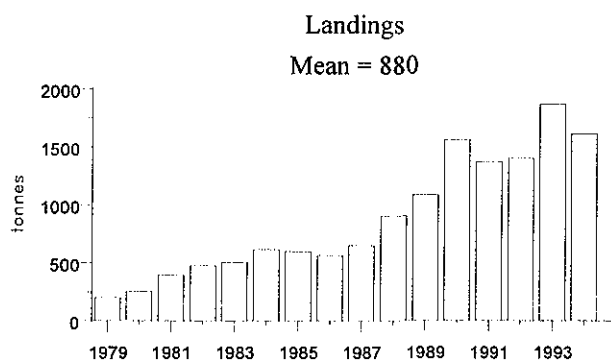
Forecast for 1996: Not available.

Management advice: The stocks remaining in coastal waters are only exploited in local fisheries and should therefore be managed on a national or local basis. The stocks moving into offshore areas would benefit from any restriction to the salmon fisheries.

Special comments: It is not known to what extent stocks in southern Sweden migrate to offshore areas or remain in coastal waters. The management of many of these stocks would benefit from knowledge of their migration pattern.

Sea trout stocks in the Gulf of Bothnia are, in similarity to wild salmon stocks in this area, severely depleted. Changes in local fishery regulations seem necessary to bring these stocks back to a better status.

Source of information: Report of the Baltic Salmon and Trout Assessment Working Group. April 1995 (C.M.1995/Assess:16).



3.13.13 Baltic Assessment Requirements

Following the request from the IBSFC a Study Group on Assessment-Related Research Activities Relevant to Baltic Fish Resources (excluding salmonids) was set up by ICES. The Group reviewed the assessment needs and the present research activities relevant to fish stock assessment in the area.

The following gives an overview of the basic requirements for carrying out reliable assessments of the fish resources in the Baltic Sea. The assessment of a fish stock can be separated into three phases:

1. A description of the past;
2. A forward projection for the coming 1–2 years;
3. Long-term forward projections.

Basic data required to carry out an assessment are:

- catch data
- data on fishing effort
- biological data on the catches (age distribution, maturity, weight, etc.)
- fishery-independent data (survey data) for indices of stock and recruitment
- data on the amount and composition of discards

The precision of an assessment is dependent on the precision of the basic data. Some of the main problems in stock assessment in the Baltic Sea are:

- poor quality of fishery statistics (catch and effort)
- errors in age determination
- problems in stock identification
- low precision of survey data

ACFM reviewed the present situation concerning basic data for fish stock assessment and concluded that, in spite of considerable effort to improve the situation, there is a strong need for better coordination of the research activities and for a critical check on the methods in use in the national laboratories. Besides the urgent need for reliable catch and effort statistics it is necessary to improve the quality of the biological sampling of commercial catches according to agreed methods. International coordination of biological sampling of landings and discards has been initiated.

There are several coordinated research projects in the Baltic involving ICES Member Countries concerned with biological sampling of commercial fisheries (including discards), trawl and acoustic surveys and research into cod recruitment mechanisms. The results of these research projects are made available to ICES for fish stock assessment and other research purposes.

The activities required to fulfil the demands for improvement of fish stock assessments in the Baltic Sea are described in detail in the Report of the Study Group and ICES will provide a more detailed description of the results at a later stage when the Report has been reviewed at the ICES Annual Science Conference.

Table 3.7.2.a.1 Nominal catch (in tonnes) of COD in Division VIa, 1980-1994, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	57	30	35	21	22	48	88	33	44	28	-	6	1	22	1
Denmark	27 ²	-	3	-	-	-	-	4	1	3	2	2	3	2	+
Faroe Islands	3	-	2	-	-	-	-	-	11	26	-	-	-	-	-
France	5,495	7,601	7,160	8,140	7,637	7,411	5,096	5,044	7,669	3,640 ^{1,4,3}	2,220 ^{1,4}	2,503 ^{1,4}	1,962 ^{1,5}	4,022 ^{1,4}	3,117 ¹
Germany, Fed. Rep.	1	21	8	205	75	66	53	12	25	281	586	60 ²	16 ²	94	n/a
Ireland	2,331	2,725	3,527	2,695	2,316	2,564	1,704	2,442	2,551	1,642	1,200	761	761	645	n/a
Netherlands	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Norway	48	40	238	267	231	204	174	77	186	207	150	40 ¹	166 ¹	73 ¹	51
Spain	-	-	41	52	64	28	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	2,302	3,187 ³	2,948	1,141	692	243	106	306	184	439	379	388	281	172	n/a
UK (N. Ireland)	2	7	33	37	32	17	54	138	46	129	93	384	436 ⁵	349	n/a
UK (Scotland)	7,603	10,339	7,969	8,933	9,483	8,032	4,251	11,143	8,465	8,942	7,151	6,480	5,403 ⁵	6,069	n/a
UK															5,613
Total	17,870	23,950	21,965	21,491	20,552	18,614	11,526	19,199	19,182	15,340	11,781	10,630	9,017	11,448	8,782
Unallocated	+9	-85	-455	-186	+719	+444	+294	-224	+1,447	+1,831	+395	+296	+69	-1,193	267
WG Estimate	17,879	23,865	21,510	21,305	21,271	18,608	11,820	18,975	20,413	17,171	12,176	10,926	9,086	10,255	9,049

¹Preliminary.²Includes Division VIb.³Including 37 t caught in Sub-area VI.⁴Includes Divisions Vb(EC) and VIb.⁵Revised.

n/a = not available.

Table 3.7.2.a.2 Cod in Division VIa (West of Scotland).

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1966	15.96	42.12	17.10	0.489
1967	6.77	50.70	22.98	0.556
1968	10.05	51.88	24.34	0.554
1969	4.26	41.49	21.60	0.712
1970	8.01	30.05	12.65	0.540
1971	10.80	26.72	10.66	0.485
1972	6.42	28.65	14.70	0.618
1973	8.78	28.02	12.26	0.533
1974	8.56	27.84	13.64	0.603
1975	11.65	28.53	13.16	0.525
1976	6.51	30.69	17.41	0.688
1977	9.92	24.50	12.62	0.615
1978	9.76	27.96	13.52	0.596
1979	15.23	27.41	16.09	0.848
1980	21.02	31.74	17.88	0.824
1981	6.06	39.71	23.87	0.686
1982	15.29	37.98	21.51	0.701
1983	9.22	33.94	21.31	0.776
1984	15.25	31.57	21.27	0.887
1985	6.10	24.85	18.61	1.014
1986	13.23	18.80	11.82	0.831
1987	29.16	20.48	18.98	0.978
1988	3.97	26.26	20.41	0.901
1989	12.87	22.87	17.17	1.016
1990	4.37	17.95	12.18	0.813
1991	6.99	15.66	10.93	0.924
1992 ¹	11.07	12.70	9.09	0.886
1993 ¹	3.74	14.59	10.32	0.809
1994 ¹	14.10	14.69	9.05	0.738
Average	10.52	28.63	16.11	0.729
Unit	Millions	1000 tonnes	1000 tonnes	-

¹Figures unreliable due to uncertainties in the assessment.

Table 3.7.2.b.1 Nominal catch (in tonnes) of COD in Division VIb, 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Faroe Islands	77	112	18	-	1	-	31	-	-	-	-	-	-
France	27	97	9	17	5	7	2	...	...	...	...	...	...
Germany, Fed. Rep.	+	195	-	3	-	-	3	+	-	126	2	-	n/a
Ireland	-	-	-	-	-	-	-	-	400	236	235	472	n/a
Norway	51	462	373	202	95	130	195	148	119	312	199 ¹	200 ¹	120
Spain	58	42	241	1,200	1,219	808	1,345	n/a	n/a	n/a	n/a	n/a	n/a
UK (England & Wales)	3	163	161	114	93	69	56	130	25	40	75	99	n/a
UK (N. Ireland)	-	-	-	-	1	-	-	3	2	2	74	4	n/a
UK (Scotland)	157	35	221	437	187	284	254	262	739	809	659	322	n/a
UK	-	-	-	-	-	-	-	-	-	-	-	-	261
Total	373	1,106	1,023	1,973	1,601	1,298	1,886	n/a	n/a	n/a	n/a	n/a	n/a

¹Preliminary.

²Included in Division VIa.

n/a = Not available.

Table 3.7.3.a.1 Nominal catch (tonnes) of HADDOCK in Divisions VIa, 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 ¹	1994 ¹
Belgium	2	1	6	7	-	29	8	9	-	9	1	7	1
Faroe Islands	-	-	-	-	-	-	-	13	-	1	-	-	-
France	3,760	4,520	4,240	5,930	4,956	5,456	3,001	1,335 ^{1,2}	863 ^{1,2}	761 ^{1,2}	762 ^{1,2}	1,465 ^{1,2}	1,099
Germany, Fed. Rep.	71	65	83	38	25	21	4	4	15	1	2	9	n/a
Ireland	4,402	3,450	3,932	3,512	2,026	2,628	2,731	2,171	773	710	700	911 ⁴	n/a
Norway	37	68	33	76	45	13	54	74	46	12	71 ¹	40	7
Spain	97	201	129	166	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a
UK (England & Wales)	2,035	1,376	1,042	348	222	425	114	476	271	151	142	28	n/a
UK (N. Ireland)	1	4	5	-	155	1	35	73	56	78	54	71	n/a
UK (Scotland)	19,249	21,593	18,472	15,036	12,955	18,503	15,151	19,651	10,803	8,341	5,200	10,302	n/a
UK (total)													7,634
Total	30,045	31,302	27,942	25,114	20,385	27,080	21,098	23,810	12,827	10,064	6,933	13,000	8,741
Discards	10,068	6,840	16,435	17,452	7,532	16,218	8,960	3,178	5,406	9,192	9,398	16,904	11,602
Unallocated landings	-432	-1,856	1,987	-730	-991	-76	-2,010	-7,117	-2,691	496	4,420	6,067	6,023
Total as used by WG	39,681	36,287	46,364	41,836	26,926	43,222	28,048	19,871	15,542	19,752	20,751 ¹	35,971	26,366

¹Preliminary.²Includes Divisions Vb(EC) and VIb.

n/a = Not available.

Table 3.7.3.a. 2 Haddock in Division VIa (West of Scotland).

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-6
1965	45.60	106.67	35.89	0.842
1966	127.94	78.91	30.59	0.551
1967	1,249.19	48.61	27.69	0.599
1968	19.58	37.75	45.80	0.804
1969	24.90	116.42	51.49	0.901
1970	322.42	163.08	40.33	0.677
1971	101.33	148.48	58.48	0.556
1972	113.72	100.95	57.46	0.974
1973	231.04	59.78	40.20	0.756
1974	614.60	36.95	33.34	0.796
1975	51.69	30.73	46.63	0.738
1976	33.18	54.14	34.07	0.677
1977	78.60	55.08	23.66	0.636
1978	219.46	35.05	19.51	0.679
1979	553.59	26.83	28.85	0.726
1980	47.73	31.74	17.48	0.593
1981	100.34	80.56	33.31	0.407
1982	55.53	103.92	39.68	0.484
1983	463.62	89.55	36.29	0.489
1984	88.10	65.64	46.36	0.729
1985	66.16	70.13	41.84	0.660
1986	321.82	63.55	26.93	0.430
1987	27.47	51.96	43.22	0.838
1988	29.36	46.29	28.05	0.671
1989	136.94	39.88	19.87	0.744
1990	152.79	24.66	15.54	0.625
1991	275.88	23.17	19.75	0.607
1992	221.43	31.25	20.75	0.484
1993	91.35	49.83	35.97	0.707
1994	224.82	49.11	26.37	0.551
Average	203.01	64.02	34.18	0.664
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.7.3.b.1 Nominal catch (tonnes) of HADDOCK in Divisions VIb, 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Faroe Islands	21	3	3	1	-	-	5	-	-	-	-	-	-
	32	48	12	116	103	99	5	...	...	...	...	...	...
France	4	1	-	4	-	-	4	1	-	-	...	-	n/a
Germany, Fed. Rep.	-	-	-	-	-	-	-	-	620	640	571	692	n/a
Ireland	3	20	45	31	83	33	20	47	38	69	47 ¹	70 ¹	75
Norway	121	79	128	892	756	371	245	n/a	n/a	n/a	n/a	n/a	n/a
Spain	3,736	113	788	1,876	703	1,271	753	1,007	568	368	271	262	n/a
UK (England & Wales)	-	-	-	-	157	-	-	8	6	11	6	35	n/a
UK (N. Ireland)	5	136	1,654	6,397	2,961	6,221	6,542	5,210	6,797	4,578	3,565	3,046	n/a
UK (Scotland)													
UK													2,703
Total	3,992	400	2,630	9,317	4,763	7,995	7,574	6,273	8,029	5,666	4,470	4,105	2,778
Unallocated catch	-	-	-	493	251	437	355	455	-4,145	-11	849	678	2,955
Working Group estimate	-	-	-	9,810	5,014	8,432	7,929	6,728	3,884	5,655	5,319	4,783	5,733

¹Preliminary.

²Included in Division VIa.

n/a = Not available.

Table 3.7.3.b.2 Haddock in Division VIb (Rockall).

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1985	77.41	19.49	9.81	0.509
1986	9.27	10.92	5.01	0.495
1987	18.34	22.60	8.43	0.503
1988	13.32	13.18	7.93	0.559
1989	11.09	9.21	6.73	1.022
1990	24.21	6.29	3.88	0.854
1991	25.18	5.82	5.66	0.706
1992	25.76	7.07	5.32	0.775
1993	23.79	10.30	4.78	0.695
1994	20.35	12.07	5.73	0.708
Average	24.87	11.70	6.33	0.683
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.7.4.a.1 Nominal catch (tonnes) of WHITING in Division VIa, 1980-1994, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Belgium	+	-	2	-	-	3	-	4	3	1	-	+	+	+	-
Denmark	32	-	+	-	-	-	-	5	-	1	+	3	1	1	+
France	2,609	1,637	1,798	2,029	1,887	1,502	829	1,644	1,249	199 ^{1,2}	180	352 ^{1,2}	105	271 ^{1,2}	435 ²
Germany, Fed.Rep.	1	49	53	43	6	9	1	+	4	+	+	+	1	1	-
Ireland	4,407	8,148	3,406	3,578	3,454	1,917	1,683	2,868	2,640	1,315	977	1,200	1,377	1,192	n/a
Netherlands	2	6	285	811	-	14	-	-	-	-	-	-	-	-	-
Spain	-	-	99	76	40	61	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	227	145	166	157	162	63	26	62	30	83	82	140	139	100	n/a
UK (N. Ireland)	-	-	-	52	40	17	5	13	89	18	73	703	186	77	n/a
UK (Scotland)	7,386	8,519	8,419	10,019	11,270	9,051	5,848	7,803	7,864	6,047	4,718	4,999	4,194	5,225	n/a
UK (all)															4,363
Total	14,664	18,504 ¹	14,235	16,765	16,859	12,637	8,392	12,399	11,879	7,666	6,030	6,897	6,007	6,867	4798 ³
Unallocated	-1,848	-6,301	-364	-795	-401	+256	-62	-855	-527	-135	-387	-237	3,697	3,294	8,244
Working Group Estimate	12,816	12,203	13,871	15,970	16,458	12,893	8,454	11,544	11,352	7,531	5,643	6,660	9,704	10,161	13,042

¹Preliminary.

²Includes Divisions Vb (EC) and VIb.

³Incomplete.

⁴Total landings for 1981 may require revision downwards.

n/a = Not available.

Table 3.7.4.a.2

Whiting in Division VIa (West of Scotland). Landings used by ACFM.

Year	Landings
1965	19,180
1966	15,542
1967	17,586
1968	13,989
1969	12,181
1970	11,223
1971	15,610
1972	15,313
1973	16,645
1974	17,057
1975	20,043
1976	24,937
1977	17,411
1978	14,677
1979	17,081
1980	12,816
1981	12,203
1982	13,871
1983	15,970
1984	16,458
1985	12,893
1986	8,454
1987	11,544
1988	11,352
1989	7,531
1990	5,643
1991	6,660
1992	9,704
1993	10,161
1994	13,042
Average	13,893
Unit	tonnes

Table 3.7.4.b.1 Nominal catches (tonnes) of WHITING in Division VIb, 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
France	-	-	3	2	-	-	-	...	...	...	...	...	...
Ireland							-	-	-	-	-	32	-
Spain	112	88	16	123	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	-	+	2	+	5	4	-	2	5	1	5	4	n/a
UK (N. Ireland)	-	-	-	-	-	-	-	15	+	+	+	6	n/a
UK (Scotland)	-	5	25	6	13	108	23	18	482	458	283	86	n/a
UK (all)													69
Total	112	93	46	131	18	112	23	35	487	459	288	128	69

¹Preliminary.²Included in Division VIa.

n/a = Not available.

Table 3.7.5.1 Nominal catch (tonnes) of SAITHE in Sub-area VI, 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Belgium	-	-	-	2	-	12	14	15	-	6	2	-	-
Denmark	4	-	-	-	-	7	+	2	-	+	1	2	-
Faroe Islands	5	-	-	-	-	-	8	-	-	24	1	-	-
France	17,102	13,470	19,706	19,120	26,521	24,581	24,656	17,106 ²	12,961 ²	12,423 ²	6,777 ²	11,142 ²	9,672 ²
Germany, Fed.Rep.	441	179	713	838	2,345	1,486	1,584	1,116	275	590	685	222	n/a
Ireland	322	698	599	670	660	704	544	593	520	260	278	317	n/a
Netherlands	-	32	-	-	-	-	-	-	n/a	n/a	n/a	n/a	n/a
Norway	19	55	66	51	72	38	50	72	64	31	67	88	74
Spain	243	330	882	624	824	533	857	n/a	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	1,966	2,760	1,800	1,349	1,259	1,708	1,193	555	1,027	799	577	717	n/a
UK (N. Ireland)	7	12	49	15	21	26	13	21	53	129	48	80	n/a
UK (Scotland)	2,141	2,642	3,170	3,118	3,697	3,442	3,925	2,851	3,035	3,554	2,608	2,756	n/a
UK (total)													3,442
Total	22,250	26,178	26,985	25,787	35,399	32,537	32,844	22,314 ¹	17,935 ¹	17,816 ¹	11,044 ¹	15,324 ¹	13,188 ¹
Unallocated	1,634	2,712	-5,344	808	4,487	-1,168	1,334	3,263	1,930	-821	760	-650	-2,758
Total figures used by WG	23,884	28,890	21,641	26,595	39,886	31,369	34,178	25,577	19,865	16,995	11,804	14,674	10,430

¹Preliminary.

²Includes Division Vb (EC).

n/a = Not available.

Table 3.7.5.2 Saithe in Sub-area VI (West of Scotland and Rockall).

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1963	30.74	11.51	6.59	0.259
1964	20.39	16.05	13.60	0.381
1965	20.39	22.43	18.40	0.540
1966	32.59	19.26	18.58	0.477
1967	23.43	27.15	16.03	0.337
1968	37.27	28.34	12.79	0.254
1969	27.00	34.72	17.12	0.292
1970	39.47	45.79	14.54	0.227
1971	35.81	51.52	19.86	0.258
1972	35.62	62.25	29.22	0.308
1973	32.51	82.98	33.83	0.395
1974	33.95	90.57	35.97	0.362
1975	25.50	72.25	30.80	0.388
1976	17.42	81.13	41.75	0.513
1977	18.27	57.07	27.21	0.465
1978	20.18	69.15	31.37	0.439
1979	22.63	56.03	21.60	0.341
1980	31.21	55.25	22.10	0.317
1981	29.96	53.46	23.57	0.317
1982	39.59	48.80	23.88	0.337
1983	41.04	56.94	28.89	0.322
1984	43.47	47.48	21.64	0.248
1985	21.96	55.69	26.60	0.286
1986	29.41	59.68	39.89	0.589
1987	29.74	48.13	31.37	0.480
1988	21.00	44.26	34.18	0.546
1989	21.20	28.38	25.58	0.815
1990	15.49	22.47	19.87	0.720
1991	14.59	17.21	17.00	0.717
1992	19.36	13.15	11.80	0.531
1993	17.38	13.61	14.67	0.524
1994	18.17	16.26	10.43	0.254
Average	27.09	44.03	23.12	0.414
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.7.6.1 MEGRIM in Sub-area VI. Nominal landings (tonnes) as officially reported to ICES, 1983-1994.

A. Division VIa												
Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	-	-	-	-	1	1	1	-	1	-	-	-
Denmark	-	-	-	-	-	-	1	-	-	+	-	-
France	1,530	1,398	1,411	777	997	1,295	457 ^{1,2}	398 ^{1,2}	455 ^{2,1}	504 ^{2,1}	589 ^{2,1}	469 ²
Germany, Fed. Rep.	-	1	+	-	-	2	+	+	-	+	-	-
Ireland	113	134	151	243	403	685	474	317	260	317	329	n/a
Spain	601	310	422	137	102	121	n/a	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	9	14	84	55	369	284	115	29	157	398	272	n/a
UK (N. Ireland)	+	-	-	+	11	70	1	8	40	18	21	n/a
UK (Scotland)	424	862	919	660	991	1,068	1,165	1,083	1,192	860	869	n/a
UK												1,148
Total	2,677	2,719	2,987	1,872	2,874	3,525	n/a	n/a	n/a	n/a	n/a	n/a
As used by Working Group								2,924	2,672	2,321	2,262	n/a

¹Preliminary.

²Includes Divisions Vb (EC) and VIb.

n/a = Not available.

B. Division VIb												
Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
France	2	9	6	11	2	1	...	...	...	...	...	...
Ireland								196	240	139	128	n/a
Spain	784	640	646	730	583	751	n/a	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	6	6	32	88	261	77	49	46	27	68	44	n/a
UK (N. Ireland)	-	-	-	-	-	-	1	1	2	5	11	n/a
UK (Scotland)	-	10	82	79	174	185	145	198	189	178	147	n/a
UK												290
Total	792	665	766	908	1,020	1,014	n/a	n/a	n/a	n/a	n/a	n/a

¹Preliminary.

²Included in Division VIa.

n/a = Not available.

C. Total for Sub-area VI											
1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
3,469	3,384	3,753	2,780	3,894	4,539	n/a	n/a	n/a	n/a	n/a	n/a

Table 3.7.7.1 ANGLERFISH in Sub-area VI. Nominal landings (tonnes) as officially reported to ICES, 1983-1994.

A. Division VIa												
Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	-	-	4	2	15	2	8	-	3	2	9	6
Denmark	-	-	-	-	4	+	34	+	1	3	4	5
Faroe Islands	-	-	-	-	-	-	1	-	-	-	-	-
France	1,543	1,723	2,036	1,505	1,601	2,329	1,901 ^{1,2}	2,182 ^{1,2}	1,910 ^{2,1}	2,189 ²	2,938 ^{1,2}	2,724 ²
Germany, Fed.Rep.	+	4	24	3	4	9	10	+	1	2	60	-
Ireland	110	172	119	295	187	324	556	398	250	403	428	-
Norway	9	6	5	6	3	8	27	8	6	14 ¹	8	6
Spain	405	355	281	142	130	269	n/a	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	36	56	52	36	241	403	176	130	272	385	181	n/a
UK (N. Ireland)	2	2	-	2	2	30	15	21	47	44	39	n/a
UK (Scotland)	1,312	1,617	1,522	1,099	1,768	2,629	2,975	2,841	2,562	2,313	2,345	n/a
UK												2,431
Total	3,417	3,935	4,043	3,090	3,955	6,003	n/a	n/a	n/a	n/a	n/a	n/a
As used by Working Group								5,799	5,357	4,632	4,999	n/a

¹Preliminary.

²Includes Divisions Vb(EC) and VIb.

n/a = Not available.

B. Division VIb												
Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Faroe Islands	-	5	4	-	-	6	1	-	-	2	-	-
France	24	35	13	19	4	4	...	...	...	...	...	...
Ireland							-	400	272	417	96	n/a
Germany							-	-	-	-	103	-
Norway	8	14	7	9	11	7	13	16	18	10 ¹	17 ¹	24
Spain	377	598	642	990	730	1,340	n/a	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	22	20	85	112	253	123	48	41	122	141	60	n/a
UK (N. Ireland)	-	-	-	-	-	-	2	1	1	3	15	n/a
UK (Scotland)	2	35	262	196	296	250	167	225	177	217	182	n/a
UK												233
Total	433	707	1,013	1,326	1,294	1,730	n/a	n/a	n/a	n/a	n/a	n/a

¹Preliminary.

²Included in Division VIa.

n/a = Not available.

C. Total for Sub-area VI												
1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1994
3,850	4,642	5,056	4,416	5,249	7,733	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 3.7.8 a.1. Herring in Division VIa (North). Catch in tonnes by country 1982-1994. These figures do not in all cases correspond to the statistics.

Country	1982	1983	1984	1985	1986	1987
Denmark	-	-	96	-	-	-
Faroes	74	834	954	104	400	-
France	2 069	1 313	-	20	18	136
FDR	8 453	6 283	5 564	5 937	2 188	1 711
Ireland	-	-	-	-	6 000	6 800
Netherlands	11 317	20 200	7 729	5 500	5 160 ²	5 212 ²
Norway	10 018	7 336	6 669	4 690	4 799	4 300
UK England	90	-	-	-	-	-
UK Scotland	38 381	31 616	37 554	28 065	25 294	26 810
Unallocated	18 958	-4 059	16 588	502	37 840 ¹	18 038 ¹
Discards	-	-	-	-	-	-
Total	92 360	63 523	75 154	43 814	81 699	63 007

Country	1988	1989	1990	1991	1992	1993	1994
Denmark	-	-	-	-	-	-	0
Faroes	-	-	326	482	-	-	0
France	44	1342	1287	1168	119	818	1 362
FDR	1 860	4 290	7 096	6 450	5 640	4 693	5 087
Ireland	6 740	8 000	10 000	8 000	7 985	8 236	7 938
Netherlands	6 131	5 680	7 693	7 979	8 000	6 132	6 093
Norway	456	-	1 607	3 318	2 389	7 447	8 183
UK Eng. & Wales	1 892	1 977	2 376	2 998	3 327	2 965	3 511
UK Scotland	25 002	27 897	35 877	29 630	29 403	29 637	27 165
Unallocated	5 229 ²	2 123 ²	2 397	-10 597	-5 485	-3 753	-4 675
Discards	-	1 550	1 300	1 180	200	820	700
Total	47 354	53 039	69 959	50 606	51 585	56 175	54 708

¹Including discards
(Discards are included in national catches)

Table 3.7.8 a.2 Herring in Division VIa (North).

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1975	2,107	120	112	0.925
1976	622	94	94	1.096
1977	646	61	41	1.039
1978	969	60	22	0.786
1979	1,528	98	0	0.001
1980	961	171	0	0.002
1981	1,789	172	51	0.321
1982	932	161	92	0.550
1983	3,841	131	64	0.481
1984	1,483	237	75	0.424
1985	1,717	243	44	0.273
1986	1,476	232	82	0.436
1987	3,611	223	63	0.315
1988	1,837	327	47	0.226
1989	1,319	352	53	0.168
1990	1,041	330	70	0.261
1991	1,207	292	51	0.247
1992	2,019	283	52	0.180
1993	2,306	295	56	0.189
1994	391	331	55	0.164
Average	1,590	211	56	0.404
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.7.8 b.1 Catches of HERRING from the Firth of Clyde (tonnes). Spring and autumn-spawners combined. These figures do not in all cases correspond to the official statistics.

Year	Scotland	Other UK	Unallocated	Discards	Total used by WG	Agreed TAC
1955					4 050	
1956					4 848	
1957					5 915	
1958					4 926	
1959					10 530	
1960					15 680	
1961					10 848	
1962					3 989	
1963					7 073	
1964					14 509	
1965					15 096	
1966					9 807	
1967					7 929	
1968					9 433	
1969					10 594	
1970					7 763	
1971					4 088	
1972					4 226	
1973					4 715	
1974					4 061	
1975					3 664	
1976					4 139	
1977					4 847	
1978					3 862	
1979					1 951	
1980					2 081	
1981					2 135	
1982	2 506	-	262	1 253	4 021	
1983	2 530	273	293	1 265 ³	4 361	
1984	2 991	247	224	2 308 ³	5 770	3 000
1985	3 001	22	433	1 344 ³	4 800	3 000
1986	3 395	-	576	679 ³	4 650	3 100
1987	2 895	-	278	439 ⁴	3 612	3 500
1988	1 568	-	110	245 ⁴	1 923	3 200
1989	2 135	-	208	- ²	2 343	3 200
1990	2 184	-	75	- ²	2 259	2 600
1991	713	-	18	- ²	731	2 900
1992	929	-	-	-	926	2 300
1993	852	-	-	-	852	1 000
1994	608	-	-	-	608	1 000

1 Calculated from estimates of weight per box and in some years estimated by-catch in the sprat fishery.

2 Reported to be at a low level, assumed to be zero

3 Based on sampling

4 Estimated assuming the same discarding rate as in 1986.

Table 3.7.9.1 Norway Pout. Annual landings (t) in Division VIa. (Data officially reported to ICES).

Country	1974	1975	1976	1977	1978	1979	1980	1981
Denmark	-	193	-	-	4,443	15,609	13,070	2,877
Faroes	1,581	1,524	6,203	2,177	18,484	4,772	3,530	3,540
Germany	179	-	8	-	-	-	-	-
Netherlands	-	322	147	230	21	98	68	182
Norway	144 ³	-	82 ³	-	-	-	-	-
Poland	75	-	-	-	-	-	-	-
UK (Scotland) ²	4,702	6,614	6,346	2,799	302	23	1,202	1,158
Russia	40	2	7,147	-	-	-	-	-
Total	6,721	8,655	19,933	5,206	23,250	20,502	17,870	7,757

Country	1982	1983	1984	1985	1986	1987	1988	1989
Denmark	751	530	4,301	8,547	5,832 ⁴	37,714 ⁵	5,849 ⁵	28,180 ⁵
Faroes	3,026	6,261	3,400	998	-	-	376	11
Germany	-	-	70	-	-	-	-	-
Netherlands	548	1,534	-	139	-	-	-	-
Norway	-	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-	-
UK (Scotland) ²	586	-	23	13	-	553	517	5
Russia	-	-	-	-	-	-	-	-
Total	4,911	8,325	7,794	9,697	5,832	38,267	6,742	28,196

Country	1990	1991	1992	1993	1994 ¹
Denmark	3,316 ³	4,348	5,147	7,338	14,811
Faroes	-	-	-	-	-
Germany	-	-	-	-	-
Netherlands	-	-	10	-	-
Norway	-	-	-	-	-
Poland	-	-	-	-	-
UK (Engl. & Wales)	-	-	2	-	-
UK (Scotland)	+	-	-	-	+
Russia	-	-	-	-	-
Total	3,316	4,348	5,159	7,338	14,812

¹Preliminary.²Amended using national data.³Including by-catch.⁴Includes Division VIb.⁵Included in Division IVa.

Table 3.7.10.1 Sandeel, Division VIa. Landings (tonnes), 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	80	-
Scotland	5,972	10,786	13,051	14,166	18,586	24,469	14,479	24,465	18,785	16,515	8,532	4,935	6,156	10,627
Total	5,972	10,786	13,051	14,166	18,586	24,469	14,479	24,465	18,785	16,515	8,532	4,935	6,236	10,627

Table 3.7.10.2 Sandeel in Division VIa.

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 1-3
1983	64,700.00	47.25	13.05	0.126
1984	27,360.00	56.64	14.17	0.140
1985	88,390.00	63.01	18.59	0.173
1986	135,450.00	47.08	24.47	0.216
1987	23,210.00	61.80	14.48	0.099
1988	17,280.00	100.26	24.46	0.199
1989	46,530.00	66.10	18.78	0.240
1990	36,910.00	38.21	16.52	0.177
1991	192,630.00	39.60	8.53	0.083
1992	129,750.00	41.74	4.94	0.032
1993	91,880.00	121.77	6.24	0.035
1994	.	149.72	10.63	0.035
Average	77,644.55	69.43	14.57	0.130
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.7.11.1 Nominal catch (tonnes) of Blue Ling 1988-1994, as officially reported to ICES.

BLUE LING Va

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	271	403	1,029	241	321	40	89*
Germany, Fed. Rep.	-	-	-	-	-	-	1
Iceland	1,093	2,124	1,992	1,582	2,584	2,193	1,542
Norway	7	5	-	-	-	-*	-*
Total	1,371	2,532	3,021	1,823	2,905	2,233	1,632

*Preliminary.

BLUE LING Vb₁

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	3,487	2,468	946	1,573	1,918	2,088	1,065*
France	3,036	1,599*	1,595*	347*	171*	90*	
Germany, Fed. Rep.	49	51	71	36	21	24	3 ²
Norway	94	228	450	196	390	218*	173*
UK (England & Wales)	-	-	-	1	4	19	-
UK (Scotland)	-	-	-	... ¹	... ¹	... ¹	... ¹
Total	6,666	4,346	3,062	2,153	2,504	2,439	

*Preliminary. ¹Included in Vb₂. ²Includes Vb₂.

BLUE LING Vb₂

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	2,788	622	68	71	1,705	182	239*
Norway	72	95	191	51	256	22*	16*
UK (Scotland)	-	-	-	2 ¹	+ ¹	9 ¹	1 ¹
Total	2,860	717	259	124	1,961	213	256

*Preliminary. ¹Includes Vb₁.

Table 3.7.11.1 (cont'd)

BLUE LING VIa

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	14	6	-	8	4	-	-*
France	6,335	7,010*	3,730*	3,157*	3,151*	3,082*	
Germany, Fed. Rep.	2	2	44	18	4	48	24
Ireland	-	-	-	-	-	3	73
Norway	29	143	54	63	129	27*	90*
UK (England & Wales)	2	-	-	2	4	13	-
UK (Scotland)	1	+	1	35	24	42	91
Total	6,383	7,161	3,829	3,283	3,316	3,215	

*Preliminary.

BLUE LING VIb

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	2,000	1,292	360	111	231	51	5*
France	499	60*	695*	2,259*	524*	632*	
Germany, Fed. Rep.	37	22	-	6	2	109	104
Norway	42	217	127	102	50	33*	33*
UK (England & Wales)	9	-	1	5	2	66	3
UK (Scotland)	14	16	2	15	14	57	25
Total	2,601	1,607	1,185	2,498	823	948	

*Preliminary.

BLUE LING XIV

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	21	13	-	-	-	-	1*
Germany, Fed. Rep.	218	58	64	105	27	16	15
Greenland	3	-	5	5	2	-	-
Iceland	-	-	-	-	-	3,124	300
Norway	-	-	-	+	50	173*	11*
UK (England & Wales)	-	-	11	45	28	21	57
UK (Scotland)	-	-	-	-	4	1	-
Total	242	71	80	155	111	3,335	384

*Preliminary.

Table 3.7.11.2 Nominal catch (tonnes) of Ling 1988-1994, as officially reported to ICES.**LING Va**

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	134	95	42	69	34	20	3
Faroe Islands	619	614	399	530	526	501	548*
Germany, Fed. Rep.	-	-	-	-	-	-	+
Iceland	5,098	4,896	5,153	5,206	4,556	4,333	4,049
Norway	10	5	-	-	-*	-*	-
Total	5,861	5,610	5,594	5,805	5,116	4,854	4,600

*Preliminary.

LING Vb₁

Country	1988	1989	1990	1991	1992	1993	1994
Denmark	4 ²	-	-	-	-	-	-*
Faroe Islands	1,383	1,498	1,575	1,828	1,218	1,242	1,541*
France	53	40*	34*	9*	2*	5*	
Germany, Fed. Rep.	4	2	1	2	+	1	1
Norway	884	1,415	1,441	1,594	1,153	921*	1,017*
UK (England & Wales)	1	-	+	-	20	62	19
UK (Scotland) ¹	...	...	...	...	...	...	...
Total	2,329	2,955	3,051	3,433	2,393	2,231	

*Preliminary. ¹Included in Vb₂. ²Includes 1 t reported as Division Vb.**LING Vb₂**

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	832	362	162	492	577	282	479*
Norway	1,284	1,328	633	555	637	332*	486*
UK (England & Wales)	-	-	-	-	-	9	1
UK (Scotland) ¹	5	3	9	4	11	11	20
Total	2,121	1,693	804	1,051	1,225	634	986

*Preliminary. ¹Includes Vb₁.

Table 3.7.11.2 (cont'd)

LING VIa

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	4	6	-	3	-	+	+
Denmark	+	1	+	+	1	+	-*
Faroe Islands	-	6	8	3	-	-	-*
France	5,118	3,170*	2,456*	1,685*	1,416*	1,580*	
Germany, Fed. Rep.	6	11	1	2	2	92	134
Ireland	196	138	41	57	38	171	133
Norway	3,392	3,858	3,263	2,029	2,305	1,937*	2,034*
Spain	580						
UK (England & Wales)	1,075	365	173	318	289	442	560
UK (Isle of Man)	-	+	-	-	+	-	-
UK (N. Ireland)	53	6	2	10	6	13	10
UK (Scotland)	874	881	736	654	680	1,133	1,126
Total	11,298						

*Preliminary.

LING VIb

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	196	17	3	-	35	4	104
France	8	2*	-*	2*	690*	-*	
Germany, Fed. Rep.	-	-	-	-	+	+	-
Ireland	-	-	26	31	23	60	44
Norway	1,253	3,616	1,315	2,489	1,713	1,179*	2,116*
Spain	2,995						
UK (England & Wales)	94	41	23	34	42	64	57
UK (N. Ireland)	-	-	+	2	2	4	4
UK (Scotland)	223	84	151	111	90	232	220
Total	4,769						

*Preliminary.

LING XIV

Country	1988	1989	1990	1991	1992	1993	1994
Germany, Fed. Rep.	3	1	1	+	9	-	+
Iceland	-	-	-	-	-	+	-
Norway	-	-	2	+	7	1*	4*
UK (England & Wales)	-	-	6	1	1	5	1
UK (Scotland)	-	-	-	-	-	-	1
Total	3	1	9	1	17	6	6

*Preliminary.

Table 3.7.11.3 Nominal catch (tonnes) of Tusk (Cusk) 1988-1994, as officially reported to ICES.

TUSK Va

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	3,757	3,908	2,475	2,286	1,567	1,329	1,212*
Iceland	3,078	3,131	4,813	6,439	6,436	4,746	4,612
Norway	20	10	-	-	-	-*	-*
Total	6,855	7,049	7,288	8,725	8,003	6,075	5,824

*Preliminary.

TUSK Vb₁

Country	1988	1989	1990	1991	1992	1993	1994
Denmark	+	-	-	-	-	-	-*
Faroe Islands	2,827	1,828	3,065	3,829	2,796	1,647	2,649*
France	81	52*	63*	16*	10*	7*	
Germany, Fed. Rep.	8	2	26	1	2	2	1 ²
Norway	1,143	1,828	2,045	1,321	1,590	1,202*	747*
UK (England & Wales)	-	-	-	-	1	3	2
UK (Scotland) ¹	...	...	...	...	...	...	...
Total	4,059	3,710	5,199	5,167	4,399	2,861	

*Preliminary. ¹Included in Vb₂. ²Includes Vb₂.

TUSK Vb₂

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	545	163	128	375	541	292	445
Norway	1,061	1,237	851	721	450	285*	462
UK (England & Wales)	-	-	-	-	-	-	+
UK (Scotland) ¹	+	+	+	+	1	+	2
Total	1,606	1,400	979	1,096	992	577	909

*Preliminary. ¹Includes Vb₁.

Table 3.7.11.3 (cont'd)

TUSK VIa

Country	1988	1989	1990	1991	1992	1993	1994
Denmark	-	+	-	-	-	-	-
Faroe Islands	-	6	9	5	-	-	*
France	724	661*	705*	483*	500*	399*	
Germany, Fed. Rep.	1	3	+	+	+	4	6
Ireland	-	2	-	-	-	3	1
Norway	1,310	1,583	1,506	998	1,124	783*	865*
UK (England & Wales)	30	4	9	10	5	2	5
UK (N. Ireland)	-	-	+	+	-	+	-
UK (Scotland)	13	6	11	17	21	31	40
Total	2,078	2,265	2,240	1,513	1,650	1,222	

*Preliminary.

TUSK VIb

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	217	41	6	-	63	12	70*
France	4	1*	3*	6*	1*	2*	
Germany, Fed. Rep.	-	-	-	+	+	+	+
Ireland	-	-	-	5	5	32	30
Norway	601	1,537	738	1,068	763	899*	1,673*
UK (England & Wales)	8	5	5	6	8	3	7
UK (N. Ireland)	-	-	+	-	1	+	-
UK (Scotland)	34	12	19	25	30	54	66
Total	864	1,596	771	1,110	871	1,002	

*Preliminary.

TUSK XIV

Country	1988	1989	1990	1991	1992	1993	1994
Faroe Islands	19	13	-	-	-	-	-
Germany, Fed. Rep.	2	1	2	2	+	+	-
Iceland	-	-	-	-	4	1	+
Norway	-	-	7	68	120	53*	16*
UK (England & Wales)	-	-	-	1	+	+	+
Total	21	14	9	71	124	54	16

*Preliminary.

3.7.12 a.1 *Nephrops* landings (tonnes) by Functional Unit plus other rectangles in Management Area C (VIa). Data for FU12 and other rectangles reflect revisions of statistical squares making up the Management Area (see Section 5.1.1)

Year	FU 11	FU 12	FU 13	Other	Total
1985	4061	4008	4184	111	12364
1986	3382	3484	4342	106	11314
1987	4084	3891	3008	260	11243
1988	4035	4463	3468	546	12512
1989	3205	4745	2 12	235	10997
1990	2543	4430	2912	217	10102
1991	2789	4442	3038	298	10567
1992	3548	4237	2744	283	10812
1993	3192	4454	3343	376	11365
1994	3477	4319	2557	483	10836

Table 3.7.12 a.2 Total *Nephrops* landings (tonnes) by country in Management Area C (VIa)

Year	UK	Spain	Ireland	Total
1985	12364	0		12364
1986	11310	4		11314
1987	11243	?		11243
1988	12512	?		12512
1989	10990	7		10997
1990	10101	1		10102
1991	10515	19	33	10567
1992	10784	18	10	10812
1993	11358	+	7	11365
1994	10834	0	2	10836

Table 3.7.12 a.3

Nephrops in Division VIa

Year	Landings
1984	11
1985	12
1986	11
1987	11
1988	13
1989	11
1990	10
1991	11
1992	11
1993	11
1994	11
Average	11
Unit	1000 tonnes

Table 3.8.2.1 Nominal catch (tonnes) of COD in Division VIIa, 1982–1994, as officially reported to ICES, and Working Group estimates of annual landings.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	269	139	135	185	222	344	269	467	310	78	174	169	121
France	1,066	815	912	1,782	1,480	1,717	2,406	352 ¹	201 ¹	320 ¹	927 ¹	505 ¹	188
Ireland	4,758	4,032	2,885	4,121	3,991	5,017	5,821	3,656	2,800	2,364	2,260	1,328	n/a
Netherlands	48	34	38	104	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	2,544	1,405	1,253	1,200	847	1,922	2,667	2,554	1,310	1,229	1,079	840	n/a
UK (Isle of Man)	161	103	98	119	80	44	118	39	48	175	129	57	26
UK (N. Ireland)	3,852	3,463	2,658	2,541	2,992	3,565	4,080	3,864	3,486	2,290	2,475	2,404	n/a
UK (Scotland)	583	336	669	1,038	446	574	472	351	1,700	485	335	453	n/a
UK ³													2,578
Total	13,281	10,327	8,648	11,090	10,058	13,183	15,833	11,283	9,855	6,941	7,379	5,756	2,913
Unallocated	-	-312	-265	-607	-206	-289	-1,665	1,468	-2,476	670	151	1,822	2,935
Total figures used by Working Group for stock assessment	13,381	10,015	8,383	10,483	9,852	12,894	14,168	12,751	7,379	7,611 ²	7,530 ²	7,578	5,848

¹Preliminary (includes Vb, V1b)

²Revised

³ UK (NI) (SCOT) (E & W) combined landings reported for 1994

n/a = not available.

Table 3.8.2.2 Cod in Division VIIa (Irish Sea).

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2–5
1968	6.78	8.94	8.54	0.748
1969	8.85	7.78	7.99	0.876
1970	15.20	6.13	6.43	0.668
1971	5.10	7.37	9.25	0.593
1972	14.05	9.99	9.23	0.527
1973	3.30	11.48	11.82	0.773
1974	11.37	10.24	10.25	0.650
1975	3.63	9.76	9.86	0.804
1976	5.47	7.80	10.25	0.710
1977	5.64	7.48	8.05	0.774
1978	12.17	6.12	6.27	0.549
1979	14.47	6.38	8.37	0.689
1980	8.13	7.06	10.78	0.669
1981	3.58	9.86	14.91	0.723
1982	5.36	11.18	13.38	0.896
1983	7.95	9.44	10.02	0.785
1984	8.08	7.04	8.38	0.747
1985	6.57	6.77	10.48	0.844
1986	18.88	6.22	9.85	0.907
1987	8.94	6.33	12.89	0.944
1988	3.97	6.19	14.17	0.985
1989	5.21	6.51	12.75	1.147
1990	5.82	4.59	7.38	1.021
1991	9.54	3.42	7.61	1.023
1992	1.71	2.98	7.53	1.270
1993	6.11	2.92	7.58	0.962
1994	4.88	3.95	5.85	0.919
Average	7.81	7.18	9.62	0.822
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.8.3.1 Nominal landings of HADDOCK in Division VIIa, 1982-1994, as officially reported to ICES, and Working Group estimates of annual landings.

Country	1982	1983	1984	1985	1986	1987	
Belgium	+	2	3	4	5	10	
France	30	7	38	31	39	50	
Ireland	167	224	199	341	275	797	
UK (England & Wales)	37	15	29	28	22	41	
UK (Isle of Man)	11	2	2	5	4	3	
UK (N. Ireland)	29	26	38	215	358	230	
UK (Scotland)	29	23	78	104	23	156	
Total	303	299	387	728	726	1,287	

Country	1988	1989	1990	1991	1992	1993	1994*
Belgium	12	4	4	1	8	18	22
France	47						
Ireland	363	215	80	254	251	252	
UK (England & Wales)	74	62	24	26	24	42	...
UK (Isle of Man)	3	3	5	14	13	19	24
UK (N. Ireland)	196	198	145	179	225	218	...
UK (Scotland)	52	79	316	138	109	140	...
United Kingdom							367
Total	747	561	574	612	630	689	n/a
Total figures used by Working Group for stock assessment						689	582

Table 3.8.4.1 Nominal catch (tonnes) of WHITING in Division VIIa, 1983-1994, as officially reported to ICES and Working Group estimates of human consumption and discards.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 ¹	1994 ¹
Belgium	78	99	100	70	109	90	92	142	53	78	50 ²	80
France	1,021	930	956	770	826	1,063	533 ¹	528 ¹	611 ¹	512 ¹	462 ¹	367
Ireland	3,047	4,276	5,521	3,101	4,067	4,394	3,871	2,000	2,200	2,100	1,440 ²	n/a
Netherlands	18	5	30	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	1,200	1,224	1,379	1,004	1,529	1,202	946	1,106	934	822	559 ²	n/a
UK (Isle of Man)	127	68	57	25	14	15	26	75	74	53	55	44
UK (N. Ireland)	5,218	5,660	8,382	4,940	4,858	4,621	5,651	4,029	3,260	3,269	3,300	n/a
UK (Scotland)	120	275	368	129	281	107	184	280	272	258	318 ²	n/a
UK												3,906
Total human consumption	10,829	12,537	16,793	10,039	11,684	11,492	11,303	8,160	7,404	7,092	6,184	4,397 ¹
Unallocated human consumption	-321	-976	-841	47	-987	-1,537	-95	-187	30	1,893	312	4,272
Estimated discards from <i>Nephrops</i> fishery ³	1,837	3,674	2,284	2,329	3,721	1,901	2,014	2,683	2,679	4,149	2,708	1,183
Total figures used by the Working Group for stock assessment	12,345	15,235	18,236	12,415	14,418	11,856	13,222	10,656	10,113	13,134	9,204	9,852

¹Preliminary.

²Revised.

³Based on UK (N. Ireland) data.

n/a Not available

Table 3.8.4.2 Whiting in Division VIIa (Irish Sea)

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-4
1980	121.93	12.69	12.67	0.837
1981	63.61	16.58	17.03	0.959
1982	67.68	12.53	17.22	1.148
1983	186.35	7.99	10.51	1.052
1984	135.48	7.20	11.56	1.032
1985	113.61	9.64	15.95	1.242
1986	176.92	7.04	10.09	1.365
1987	93.21	7.44	10.70	1.193
1988	102.37	9.42	9.96	0.977
1989	132.17	6.51	11.21	1.666
1990	132.79	5.75	7.97	1.178
1991	242.88	6.46	7.43	1.107
1992	56.76	7.62	8.99	1.598
1993	134.84	12.92	6.50	0.984
1994	146.94	8.47	8.67	1.269
Average	127.17	9.22	11.10	1.174
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.8.5.1 Nominal landings (t) of PLAICE in Division VIIa, 1981–1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	231	130	195	118	285	384	403	243	265	301	138	321	128	340
France	51	60	99	38	110	165	87	58	11 ¹	105 ¹	20 ¹	42	13 ¹	11
Ireland	1,243	923	1,384	1,420	2,000	1,858	2,132	2,009	1,406	1,350	900	1,355	654	n/a
Netherlands	40	29	73	30	1,091	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	2,117	1,868	1,666	2,301	2,295	1,774	2,366	1,630	2,017	1,644	1,234	1,147	1,015	n/a
UK (Isle of Man)	27	12	11	11	26	12	9	12	18	27	51	24	13	14
UK (N. Ireland)	132	159	183	203	198	272	332	286	370	325	334	226	104	n/a
UK (Scotland)	64	47	42	86	118	119	243	127	94	204	95	67	73	n/a
UK (Total)														1,134
Total	3,906	3,228	3,653	4,207	6,123	4,584	5,572	4,365	4,181	3,956	2,772	3,182	2,000	1,499
Discards	-	-	-	-	-	250	270	220	0	0	0	0	0	0
Unallocated	0	9	-14	34	-1,048	-28	378	420	191	-681	-218	85	-4	558
Total figures used by the Working Group for stock assessment	3,906	3,237	3,639	4,241	5,075	4,806	6,220	5,005	4,372	3,275	2,554	3,267	1,996	2,057

¹Provisional
n/a Not available.
{UK (Total) excludes Isle of Man data}.

Table 3.8.5.2 Plaice in Division VIIa (Irish Sea)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1964	32.80	7.85	2.88	0.312
1965	16.94	8.97	3.66	0.371
1966	15.44	9.70	4.27	0.429
1967	12.38	10.09	5.06	0.512
1968	14.26	9.44	4.70	0.486
1969	21.17	8.76	4.39	0.468
1970	19.69	7.98	3.58	0.404
1971	13.50	7.67	4.23	0.636
1972	10.06	8.67	5.12	0.606
1973	13.42	6.99	5.06	0.753
1974	13.21	5.31	3.72	0.755
1975	11.07	5.54	4.06	0.754
1976	17.24	3.78	3.47	0.876
1977	19.19	2.97	2.90	0.779
1978	23.11	3.49	3.23	0.690
1979	20.90	4.21	3.43	0.574
1980	15.59	4.65	3.90	0.657
1981	8.35	5.73	3.91	0.536
1982	21.28	5.48	3.24	0.511
1983	21.33	4.72	3.64	0.668
1984	22.50	5.53	4.24	0.538
1985	16.27	6.51	5.08	0.579
1986	19.83	7.33	4.81	0.591
1987	21.54	6.85	6.22	0.818
1988	13.05	6.45	5.01	0.764
1989	7.29	6.25	4.37	0.588
1990	12.04	5.63	3.28	0.572
1991	9.43	4.59	2.55	0.460
1992	11.11	4.23	3.27	0.719
1993	11.88	3.58	2.00	0.563
1994	11.76	4.25	2.06	0.449
Average	16.05	6.23	3.91	0.594
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.8.6.1 Irish Sea SOLE. Nominal catches (t), 1982-1994, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	669	544	425	589	930	987	915	1,010	786	371	531	495	728
France	9	3	10	9	17	5	11	5 ¹	2 ¹	3 ¹	11 ¹	2 ¹	8
Ireland	161	203	187	180	235	312	366	155	170	198	164	98	n/a
Netherlands	138	224	113	546	-	-	-	-	-	-	-	-	-
UK (Engl.& Wales)	277	219	230	269	637	599	507	527	493	488	408	299	-
UK (Isle of Man)	10	10	6	12	1	3	1	2	10	44	14	4	5
UK (N. Ireland)	31	33	38	36	50	72	47	83	73	71	65	41	-
UK (Scotland)	44	29	17	28	46	63	38	40	41	27	36	28	-
United Kingdom	-	-	-	-	-	-	-	-	-	-	-	-	418
Total	1,339	1,265	1,026	1,669	1,916	2,041	1,885	1,822	1,575	1,202	1,229	967	1,159
Unallocated	-1	-96	32	-523	79	767	114	11	8	12	30	56	210
Total figures used by Working Group for stock assessment	1,338	1,169	1,058	1,146	1,995	2,808	1,999	1,833	1,583	1,214	1,259	1,023	1,369

¹Preliminary.

Table 3.8.6.2 Sole in Division VIIa (Irish Sea)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 4-7
1970	11.59	5.93	1.79	0.373
1971	3.77	5.90	1.88	0.385
1972	14.84	5.47	1.45	0.378
1973	7.10	4.61	1.43	0.349
1974	7.54	5.30	1.31	0.376
1975	4.64	5.37	1.44	0.328
1976	18.20	5.02	1.46	0.379
1977	10.27	4.63	1.15	0.322
1978	9.79	5.55	1.11	0.316
1979	5.86	5.97	1.61	0.400
1980	4.86	5.64	1.94	0.535
1981	2.65	5.48	1.67	0.396
1982	6.49	4.53	1.34	0.399
1983	17.75	3.69	1.17	0.410
1984	18.65	3.65	1.06	0.341
1985	26.99	5.13	1.15	0.321
1986	4.49	6.47	2.00	0.433
1987	4.20	7.41	2.81	0.786
1988	5.20	6.04	2.00	0.501
1989	6.80	5.03	1.83	0.464
1990	14.63	3.70	1.58	0.512
1991	5.57	3.17	1.21	0.401
1992	5.96	4.19	1.26	0.376
1993	5.16	3.47	1.02	0.414
1994	4.63	3.66	1.37	0.431
Average	9.10	5.00	1.52	0.413
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.8.7.1 Irish Sea HERRING (Division VIIa(N)). Catch in tonnes by country, 1981-1994. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.

Country	1981	1982	1983	1984	1985	1986	1987
France	-	-	48	-	-	-	-
Ireland	283	300	860	1,084	1,000	1,640	1,200
UK	4,094	3,375	3,025	2,982	4,077	4,376	3,290
Unallocated	-	1,180	-	-	4,110	1,424	1,333
Total	4,377	4,855	3,933	4,066	9,187	7,440	5,823

Country	1988	1989	1990	1991	1992	1993	1994
France	-	-	-	-	-	-	-
Ireland	2,579	1,430	1,699	80	406	0	0
UK	7,593	3,532	4,613	4,318	4,864	4,408	4,828
Unallocated	-	-	-	-	-	-	-
Total	10,172	4,962	6,312	4,398	5,270	4,408	4,828

Table 3.8.7.2 Irish Sea herring (Division VIIa).

Year	Landings
1972	27
1973	23
1974	39
1975	25
1976	21
1977	15
1978	11
1979	12
1980	11
1981	4
1982	5
1983	4
1984	4
1985	9
1986	7
1987	6
1988	10
1989	5
1990	6
1991	4
1992	5
1993	4
1994	5
Average	11
Unit	1000 tonnes

Table 3.8.8.1 *Nephrops* landings (tonnes) by Functional Unit plus other rectangles in Management Area J (VIIa excluding rectangles 33E2-E5).

Year	FU 14	FU 15	Other	Total
1985	541	6443		6984
1986	728	8882		9610
1987	534	9331		9865
1988	516	8630		9146
1989	438	8084		8522
1990	644	8278	<1	8922
1991	859	9468		10372
1992	495	7502	2	7999
1993	618	8111		8729
1994	515	7322		7837

Table 3.8.8.2 Total *Nephrops* landings (tonnes) by country in Management Area J (VIIa excluding rectangles 33E2-E5)

Year	UK	Isle of Man	Republic of Ireland	France	Belgium	Total
1985	4913	3	2026	42	0	6984
1986	5929	7	3581	93	<1	9610
1987	5514	18	4278	55	0	9865
1988	5780	39	2965	62	0	9146
1989	6011	8	2484	19	0	8522
1990	6165	25	2724	8	0	8922
1991	6864	61	3390	12	<1	10372
1992	5596	14	2381	6	<1	7999
1993	5939	32	2750	8	0	8729
1994	6147	16	1673	1	0	7837

Table 3.8.8.3 *Nephrops* in Division VIIa (excluding rectangles 33 E2-5)

Year	Landings
1984	7,689
1985	6,984
1986	9,610
1987	9,865
1988	9,146
1989	8,522
1990	8,922
1991	10,372
1992	7,999
1993	8,729
1994	7,837
Average	8,698
Unit	tonnes

Table 3.9.2.1 Nominal landings of Celtic Sea cod as used by the Working Group in 1995.

Divisions VIIc, VIIg and VIIh						
Year	Belgium	France	Ireland	UK (England and Wales)	Others	Total
1973	524	2413	84	198	30	3227
1974	197	1954	24	154		2329
1975	377	2657	15	130	30	3209
1976	226	3535	13	97	1	3872
1977	107	2272	17	62		2458
1978	88	2744	30	69		2931
1979	110	3469	72	88		3737
1980	172	5187	246	209	7	5821
1981	285	7808	108	317		8516
1982	174	8391	142	338		7045
1983	262	7013	274	199		7748
1984	240	4569	204	316		5329
1985	456	5632	198	398		6684
1986	374	7473	226	345		8418
1987	216	7187	380	437		8220
1988	542	12065	612	400		13619
1989	891	14298	1003	482		16674
1990	615	8612	177	689		10093
1991	297	5750	246	590		6883
1992	193	6417	340	655		7605
1993	386	7650	331	604		8971
1994*	398	6727	919	476		8520

* = provisional

Table 3.9.2.2 Celtic Sea Cod (Divisions VIIf, VIIg and VIIh)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1971	2.70	7.43	4.65	0.634
1972	0.51	5.63	3.81	0.550
1973	1.46	6.46	3.23	0.600
1974	0.44	5.37	2.33	0.409
1975	3.26	5.46	3.21	0.800
1976	1.02	3.66	3.87	0.582
1977	1.46	5.87	2.46	0.400
1978	1.42	6.01	2.93	0.407
1979	3.46	6.56	3.74	0.552
1980	6.25	5.86	5.82	0.787
1981	2.62	6.02	8.52	0.888
1982	1.06	9.71	7.05	0.691
1983	3.77	9.86	7.75	0.902
1984	3.69	4.99	5.33	0.548
1985	3.17	8.83	6.68	0.569
1986	2.65	9.78	8.42	0.826
1987	13.29	8.18	8.22	0.858
1988	6.01	8.20	13.62	0.691
1989	2.07	19.12	16.67	0.914
1990	2.33	13.80	10.09	1.004
1991	5.57	7.23	6.88	1.009
1992	5.81	5.31	7.61	0.892
1993	1.27	8.47	8.97	0.918
1994	2.50	10.71	8.52	0.940
Average	3.24	7.86	6.68	0.724
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.3.1 Nominal catches landed of Celtic Sea Whiting as used by the Working Group in 1995.

Divisions VIIIf, VIIg and VIIh

Year	Belgium	France	Ireland	UK (England and Wales)	Total
1982	70	7316	62	191	7639
1983	125	8282	124	165	8696
1984	157	6737	299	231	7424
1985	165	7095	138	192	7590
1986	105	6756	138	136	7135
1987	109	8422	198	289	9018
1988	155	9717	189	354	10415
1989	293	10900	1334	309	12836
1990	304	9750	174	412	10640
1991	290	9111	190	481	10072
1992	106	8452	236	305	9099
1993	143	9975	654	341	11113
1994*	225	11168	1909	330	13632

* = provisional

Table 3.9.3.2 Celtic Sea Whiting (Division VIIIf, VIIg and VIIh)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1982	17.18	13.09	7.64	1.042
1983	30.18	10.86	8.70	1.451
1984	24.38	11.38	7.42	1.270
1985	26.27	12.10	7.59	1.183
1986	34.56	12.70	7.14	1.088
1987	66.45	13.56	9.02	1.330
1988	54.95	22.50	10.42	1.073
1989	16.53	27.94	12.84	1.045
1990	26.18	18.38	10.64	1.015
1991	49.62	13.75	10.07	1.245
1992	68.40	16.58	9.10	0.936
1993	48.12	26.42	11.11	0.656
1994	17.84	26.78	13.63	0.921
Average	36.97	17.39	9.64	1.097
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.4.1 Celtic Sea PLAICE. Nominal landings (tonnes) in Divisions VII f+g, 1977-1994, as used by the Working Group.

Year	Belgium	France	Ireland	UK (Engl. & Wales)	Others	Total reported	Unallocated	Total as used by WG
1977	214	365	28	150	0	757	0	757
1978	196	527	0	152	0	875	0	875
1979	171	467	49	176	0	863	0	863
1980	372	706	61	227	7	1,373	0	1,373
1981	365	697	64	251	0	1,377	0	1,377
1982	341	568	198	196	0	1,303	0	1,303
1983	314	532	48	279	0	1,173	-27	1,146
1984	283	558	72	366	0	1,279	-69	1,210
1985	357	493	91	466	0	1,407	345	1,752
1986	544	598	59	324	21	1,546	145	1,691
1987	576	708	122	495	0	1,901	0	1,901
1988	635	687	164	630	0	2,116	0	2,116
1989	835	649	195	472	0	2,151	0	2,151
1990	777	642	167	496	0	2,082	0	2,082
1991	479	533	94	395	0	1,501	0	1,501
1992	326	455	106	301	0	1,188	0	1,188
1993	396	342	87	290	0	1,114	0	1,114
1994	357	297	182	250	0	1,086	0	1,086

N.B.: ICES receives statistics from some countries only for Divisions VII g-k combined and not for each Division separately. The figures up to 1982 and 1987 onwards are provided by members of the Working Group; from 1983-1986, they are figures submitted to the EC by member states.

Table 3.9.4.2 Celtic Sea Plaice (Divisions VIIIf and g)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1977	3.64	1.00	0.76	0.608
1978	5.07	0.87	0.88	0.641
1979	8.24	1.15	0.86	0.628
1980	5.54	1.51	1.37	0.531
1981	2.12	1.59	1.38	0.483
1982	3.71	1.82	1.30	0.642
1983	8.90	1.69	1.15	0.567
1984	9.87	1.76	1.21	0.675
1985	7.94	2.12	1.75	0.508
1986	8.03	2.42	1.69	0.507
1987	11.90	2.57	1.90	0.691
1988	7.24	3.04	2.12	0.747
1989	2.81	2.51	2.15	0.725
1990	1.92	2.58	2.08	0.826
1991	4.85	2.02	1.50	0.679
1992	3.91	1.81	1.19	0.619
1993	1.86	1.39	1.11	0.567
1994	5.25	1.31	1.09	0.827
Average	5.71	1.84	1.42	0.637
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.5.1. Celtic Sea SOLE. Divisions VIIIf and VIIg. Nominal landings (tonnes), 1982-1994.
Data used by the Working Group

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	819	871	786	786	1,092	704	725	660	689	839	516	512	611
France	100	124	115	126	92	72	89	97	100	80	136	103	94
Ireland	3	48	4	13	12	9	15	32	41	N/A	4	28	47
UK(Engl. & Wales)	206	330	361	403	404	437	317	203	359	395	325	285	264
Others	-	-	-	-	-	-	-	-	-	10	-	-	-
Total	1,128	1,373	1,266	1,328	1,600	1,222	1,146	992	1,189	1,324	981	928	1,016
Unallocated	-	-	-	-	-	-	-	-	-	-217	-	-	-
Total used by Working Group in Assessment	1,128	1,373	1,266	1,328	1,600	1,222	1,146	992	1,189	1,107	981	928	1,016

¹Preliminary

Table 3.9.5.2 Celtic Sea Sole (Divisions VIIIf and g)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 4-8
1971	9.16	5.22	1.86	0.434
1972	4.26	4.52	1.28	0.314
1973	3.41	4.32	1.39	0.264
1974	3.49	4.54	1.11	0.272
1975	2.91	4.05	0.92	0.233
1976	5.16	3.47	1.35	0.417
1977	4.66	3.58	0.96	0.261
1978	5.54	3.47	0.78	0.198
1979	3.59	3.47	0.95	0.277
1980	5.19	3.80	1.31	0.302
1981	4.90	3.13	1.21	0.361
1982	4.96	3.42	1.13	0.353
1983	6.91	3.24	1.37	0.456
1984	4.82	3.46	1.27	0.395
1985	5.84	3.24	1.33	0.424
1986	3.21	3.12	1.60	0.519
1987	5.72	2.49	1.22	0.556
1988	4.38	2.50	1.15	0.553
1989	3.96	2.05	0.99	0.533
1990	9.30	2.13	1.19	0.667
1991	4.39	1.97	1.11	0.413
1992	4.63	2.65	0.98	0.374
1993	4.19	2.58	0.93	0.436
1994	4.80	2.23	1.02	0.496
Average	4.97	3.28	1.18	0.396
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.6.1 Western Channel Cod. Nominal catches (t) of cod in Division VIIe as used by the Working Group.

Country	1987	1988	1989	1990	1991	1992 ¹	1993	1994
Belgium	10	12	19	6	6	2	5	1
Denmark	-	-	-	5	-	-	1	2 ¹
France	1,119	1,899	1,453	654	341	331	286	249
UK (England and Wales)	497	832	724	605	402	364	274	311
UK (Scotland)	-	-	2	4	-	-	1	-
Total	1,626	2,743	2,198	1,274	749	697	528	563

¹Preliminary.**Table 3.9.7.1** Western Channel Whiting. Nominal catches (t) of whiting in Division VIIe as used by the Working Group.

Country	1987	1988	1989	1990	1991	1992 ¹	1993	1994
Belgium	2	4	3	4	2	1	2	2
France	1,510	1,485	915	479	667	543	625	772
UK (England and Wales)	746	1,167	911	1,352	1,431	931	1,240	1,028
UK (Scotland)	-	-	5	41	21	-	5	-
Total	2,258	2,656	1,834	1,876	2,121	1,475	1,769	1,802

¹Preliminary.

Table 3.9.8.1 English Channel PLAICE. Nominal landings (tonnes) in Division VIIe, 1976-1993, as used by the Working Group.

Year	Belgium	Denmark	France	UK (Engl. & Wales)	Others	Total reported	Unallocated ²	Total as used by WG
1976	5	- ¹	323	312	-	640	-	640
1977	3	- ¹	336	363	-	702	-	702
1978	3	- ¹	314	467	-	78	-	784
1979	2	- ¹	458	515	-	975	2	977
1980	23	- ¹	325	609	9	966	113	1,079
1981	27	-	537	953	-	1,517	-16	1,501
1982	81	-	363	1,109	-	1,553	135	1,688
1983	20	-	371	1,195	-	1,586	-91	1,495
1984	24	-	278	1,144	-	1,446	101	1,547
1985	39	-	197	1,122	-	1,358	83	1,441
1986	26	-	276	1,389	- ¹	1,691	119	1,810
1987	68	-	435	1,419	-	1,922	36	1,958
1988	90	-	584	1,654	-	2,328	130	2,458
1989	89	-	448 ²	1,708	2	2,247	111	2,358
1990	82	2	N/A ³	1,873	18	1,975	618	2,593
1991	57	-	251 ²	1,314	16	1,638	210	1,848
1992	25	-	277 ²	1,110	19	1,431	193	1,624
1993	56	-	279 ²	1,079	4	1,417	-	1,417
1994	10	-	148 ²	996	3	1,156	-	1,156

¹Included in Division VIIId.

²Estimated by the Working Group.

³Divisions VIIId,e = 14,739 t.

Table 3.9.8.2 Plaice in Division VIIe (Western English Channel)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-7
1976	3.79	1.33	0.64	0.436
1977	2.01	1.37	0.70	0.429
1978	3.08	1.51	0.78	0.404
1979	6.98	1.64	0.98	0.531
1980	6.38	1.86	1.08	0.546
1981	2.63	2.56	1.50	0.482
1982	5.88	2.74	1.69	0.547
1983	5.39	2.67	1.50	0.592
1984	6.82	2.54	1.55	0.542
1985	6.62	2.76	1.44	0.546
1986	13.49	2.82	1.81	0.548
1987	11.77	2.63	1.96	0.636
1988	8.37	3.59	2.46	0.454
1989	3.34	4.12	2.36	0.618
1990	3.62	4.04	2.59	0.682
1991	3.99	3.17	1.85	0.609
1992	4.78	2.49	1.62	0.709
1993	3.31	2.01	1.42	0.830
1994	4.62	1.68	1.16	0.780
Average	5.62	2.50	1.53	0.575
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.9.1 Division VIIe SOLE. Nominal landings (tonnes), 1972-1993 used by the Working Group.

Year	Belgium	France	UK (Engl. & Wales)	Other	Total Reported	Unreported ²	Total as used by WG
1972	6	230 ¹	201	-	437	-	437
1973	2	263 ¹	194	-	459	-	459
1974	6	237	181	-	424	3	427
1975	3	271	217	-	491	-	491
1976	4	352	260-	-	616	-	616
1977	3	331	271	-	606	-	606
1978	4	384	453	20	861	-	861
1979	1	515	665	-	1,181	-	1,181
1980	45	447	764	13	1,269	-	1,269
1981	16	415	788	1	1,220	-5	1,215
1982	98	321	1,028	-	1,447	-1	1,446
1983	47	405	1,043	3	1,498	-	1,498
1984	48	421	901	-	1,370	-	1,370
1985	58	130	911	-	1,099	310	1,409
1986	62	467	840	127	1,496	-128	1,368
1987	48	432	632	-	1,112	47	1,159
1988	67	98	784	-	949	401	1,350
1989	69	112 ³	611	7	799	362	1,161
1990	41	81 ³	634	1	757	325	1,082
1991	35	111 ²	480	1	627	104	731
1992	41	122 ²	456	1	620	149	769
1993	59	223	480	-	747	-	762
1994 ³	33	91	546	-	670	-	670

¹Estimated from Division VIIId,e total by the Working Group.

²Estimated by the Working Group.

³Provisional

Table 3.9.9.2 Sole in Division VIIe (Western English Channel)

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-7
1969	1.23	2.49	0.35	0.167
1970	3.39	2.93	0.39	0.170
1971	3.01	2.55	0.43	0.219
1972	2.41	3.34	0.44	0.173
1973	3.58	2.36	0.46	0.226
1974	3.50	2.55	0.43	0.179
1975	3.22	3.57	0.49	0.158
1976	7.07	3.45	0.62	0.174
1977	5.00	4.17	0.61	0.151
1978	4.39	4.83	0.86	0.198
1979	5.00	5.51	1.18	0.237
1980	8.55	5.90	1.27	0.215
1981	4.77	5.01	1.22	0.271
1982	3.93	5.28	1.45	0.330
1983	6.09	4.63	1.50	0.395
1984	6.79	4.29	1.37	0.383
1985	3.65	3.86	1.41	0.425
1986	5.64	3.79	1.37	0.402
1987	3.57	3.80	1.16	0.346
1988	3.64	3.87	1.35	0.403
1989	2.98	2.89	1.16	0.442
1990	6.20	2.81	1.08	0.380
1991	3.90	2.67	0.73	0.248
1992	3.30	3.17	0.77	0.249
1993	3.01	2.65	0.76	0.312
1994	3.79	3.03	0.67	0.239
Average	4.29	3.67	0.90	0.273
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.10.1 Bay of Biscay sole (Divisions VIIa,b). International landings and discards used by the Working Group (in tonnes).

Years	Official landings	Unallocated landings	WG landings	WG catches	Discards
1979	2443	176	2619	2866	247
1980	2689	297	2986	3255	269
1981	2694	242	2936	3352	416
1982	1764	2049	3813	4321	508
1983	2669	959	3628	4073	445
1984	3183	855	4038	4402	365
1985	3925	326	4251	4556	305
1986	4567	238	4805	5031	226
1987	4379	707	5086	5676	590
1988	4451	931	5382	6029	647
1989	5790	55	5845	6524	679
1990	5537	379	5916	6471	555
1991	4707	862	5569	6047	478
1992	6360	190	6550	7027	477
1993	6023	397	6420	6791	371
1994	6879	347	7226	7593	367
Mean	4254	563	4817	5251	434

Table 3.9.10.2 Sole in Divisions VIIa,b (Bay of Biscay)

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-6
1979	47.71	7.25	2.87	0.285
1980	48.34	10.16	3.26	0.300
1981	56.23	11.42	3.35	0.265
1982	57.88	12.35	4.32	0.319
1983	58.01	11.25	4.07	0.298
1984	52.66	12.04	4.40	0.318
1985	47.37	13.04	4.56	0.332
1986	51.27	14.21	5.03	0.358
1987	47.88	14.79	5.68	0.383
1988	55.89	13.96	6.03	0.431
1989	55.15	12.90	6.52	0.512
1990	62.15	12.54	6.47	0.466
1991	38.54	13.03	6.05	0.416
1992	41.75	14.27	7.03	0.494
1993	15.12	16.01	6.79	0.470
1994	49.81	14.38	7.59	0.606
Average	49.11	12.73	5.25	0.391
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.11.1 Celtic Sea and Division VIIj HERRING landings by calendar year (t), 1985-1994. (Data provided by Working Group members.)

These figures may not in all cases correspond to the official statistics and cannot be used for management purposes.

Year	France	Germany	Ireland	Netherlands	U.K.	Unallocated	Discards	Total
1985	600	-	11,000	-	-	4,600	3,100	19,300
1986	-	-	13,300	+	-	6,100	3,900	23,300
1987	800	-	15,500	1,500	-	5,300	4,200	27,300
1988	-	-	16,800	-	-	-	2,400	19,200
1989	+	-	16,000	1,900	-	1,300	3,500	22,700
1990	+	-	15,800	1,000	200	700	2,500	20,200
1991	+	100	19,400	1,600	-	600	1,900	23,600
1992	500	-	18,000	100	+	2,300	2,100	23,000
1993	-	-	19,000	1,300	+	-1,100	1,900	21,100
1994 ¹	+	-	17,400	1,300	+	-1,300	1,700	19,100

¹ Preliminary

Table 3.9.11.2 Celtic Sea and Division VIIj herring landings (t) by season (1 April - 31 March). (Data provided by Working Group members).

These figures may not in all cases correspond to the official statistics and cannot be used for management purposes.

Year	France	Germany	Ireland	Netherlands	U.K.	Unallocated	Discards	Total
1985/1986	600	-	12,000	-	-	4,500	3,300	20,400
	-	-	14,700	+	-	6,100	4,200	25,000
1986/1987	800	-	15,500	1,500	-	4,400	4,000	26,200
1987/1988	-	-	17,000	-	-	-	3,400	20,400
1988/1989	+	-	15,000	1,900	-	2,600	3,600	23,100
1989/1990	+	-	15,000	1,000	200	700	1,700	18,600
1990/1991	500	100	21,400	1,600	-	-100	2,100	25,600
1991/1992	-	-	18,000	1,300	-	-100	2,000	21,200
1992/1993	-	-	16,600	1,300	+	-1,100	1,800	18,600
1993/1994	+	-	17,400	1,300	+	-1,300	1,900	19,300
1994/1995								

Table 3.9.11.3 Herring south and south west of Ireland (Celtic Sea and Division VIIj).

Year	Recruitment Age 1	Spawning Stock Biomass	Landings ¹	Fishing Mortality Age 2-7
1958	325	95	23	0.406
1959	1,038	107	15	0.329
1960	294	109	18	0.354
1961	259	95	15	0.199
1962	512	91	22	0.435
1963	274	83	17	0.286
1964	1,037	102	11	0.171
1965	360	125	19	0.237
1966	657	118	27	0.314
1967	689	117	28	0.410
1968	849	128	30	0.353
1969	453	120	44	0.550
1970	241	89	32	0.502
1971	874	87	31	0.709
1972	273	77	38	0.601
1973	313	56	27	0.657
1974	138	40	20	0.633
1975	152	29	16	0.607
1976	203	26	10	0.593
1977	174	27	8	0.412
1978	134	27	8	0.372
1979	238	28	10	0.494
1980	145	27	13	0.678
1981	409	31	17	0.869
1982	661	47	13	0.786
1983	732	69	25	0.631
1984	568	62	27	1.005
1985	557	63	20	0.443
1986	531	68	25	0.553
1987	1,014	77	26	0.733
1988	398	76	20	0.398
1989	487	70	23	0.540
1990	417	64	18	0.423
1991	147	52	26	0.577
1992	679	46	21	0.998
1993	194	39	19	0.785
1994	697	43	19	1.024
Average	463	70	21	0.542
Unit	Millions	1000 tonnes	1000 tonnes	-

¹Landings by season (1 April of year indicated - 31 March of following year).

Table 3.9.12.1 Nominal catch of sprat in Divisions VIIId,e, 1983-1994.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Belgium	3	-	-	-	-	-	-	-	-	-	-	-
Denmark	638	1,417	-	15	250	2,529	2,092	608	-	-	-	-
France	60	47	14	-	23	2	10	-	-	35	2	1
Germany	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	1,454	589	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-
UK (Engl.& Wales)	4,756	2,402	3,771	1,163	2,441	2,944	1,319	1,508	2,567	1,790	1,798	3,132
Total	6,911	4,455	3,785	1,178	2,714	5,475	3,421	2,116	2,567	1,825	1,800	3,133

¹Preliminary**Table 3.9.12.2** Sprat in Divisions VIIId,e.

Year	Landings
1974	3,793
1975	1,571
1976	3,724
1977	3,237
1978	4,999
1979	14,833
1980	17,732
1981	13,890
1982	6,612
1983	6,911
1984	4,455
1985	3,785
1986	1,178
1987	2,714
1988	5,475
1989	3,421
1990	2,116
1991	2,567
1992	1,825
1993	1,800
1994	3,133
Average	5,227
Unit	tonnes

Table 3.9.13.1 Megrim (*L. whiffagonis*) in sub-areas VII and VIIIa,b.
Nominal landings and catches (t) provided by the Working Group.

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
France			4462	4892	5084	5417	4258	3647	4069	3478	2806
Spain			10242	8772	9247	9482	7127	7780	7349	6526	5624
U.K.			2048	1600	1956	1451	1380	1617	1982	2164	2238
Ireland			1563	1561	995	2548	1381	1956	2113	2592	2420
Total landings	16659	17865	18315	16825	17282	18898	14146	15000	15513	14759	13088
Total discards	2169	1732	2321	1705	1725	2582	3242	3195	2931	3021	2328
Total catches	18828	19597	20636	18530	19007	21480	17388	18195	18444	17780	15416

Table 3.9.13.2 Megrim (*L.whiffiagonis*) in Divisions VIIb,c,e-k and VIIa,b

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1984	235.11	84.78	18.83	0.202
1985	231.72	81.83	19.60	0.222
1986	212.84	83.80	20.64	0.195
1987	185.16	88.11	18.53	0.239
1988	186.11	79.85	19.01	0.240
1989	280.39	66.61	21.48	0.285
1990	345.85	62.55	17.39	0.327
1991	369.09	64.48	18.20	0.475
1992	269.18	72.83	18.44	0.344
1993	285.36	76.05	17.78	0.293
1994	250.25	80.70	15.42	0.212
Average	259.19	76.51	18.66	0.276
Unit	Millions	1000 tonnes	1000 tonnes	-

**Table 3.9.14.1 Landings (tonnes) of both species of anglerfish
in Divisions VIIb-k and VIIIa,b
Working group estimates**

Year	VIIb-k	VIIIa,b	Total
1985	23132	6250	29382
1986	24501	5733	30234
1987	20700	6324	27024
1988	21331	6025	27356
1989	22892	5379	28271
1990	21691	5561	27252
1991*	20366	4331	24697
1992*	17752	3391	21142
1993*	16243	3150	19393
1994**	18163	3714	21877

* revised

** preliminary

**Table 3.9.14.2 Landings (tonnes) of *L. piscatorius*
in Divisions VIIb-k and VIIIa,b
Working group estimates**

Year	VIIb-k	VIIIa,b	Total
1985	18163	4160	22323
1986	16549	3811	20360
1987	14818	4266	19084
1988	13774	3958	17732
1989	15522	3047	18569
1990*	14989	3157	18146
1991*	14107	1947	16054
1992*	11933	1302	13235
1993*	11599	1548	13147
1994**	14097	1979	16077

* revised

** preliminary

**Table 3.9.14.3 Landings (tonnes) of *L. budegassa*
in Divisions VIIb-k and VIIIa,b
Working group estimates**

Year	VIIb-k	VIIIa,b	Total
1985	4969	2090	7059
1986	7952	1922	9874
1987	5882	2058	7940
1988	7557	2067	9624
1989	7370	2332	9702
1990*	6702	2404	9105
1991*	6259	2384	8643
1992*	5818	2089	7907
1993*	4644	1602	6246
1994**	4065	1735	5800

* revised

** preliminary

Table 3.9.14.4 Lophius piscatorius in Divisions VIIb-k and VIIIa,b
Nominal landings in tonnes

Year	VIIb-k										VIIIa,b						TOTAL VII + VIII
	IRELAND Trawl (Unit 4)	IRELAND Trawl (Unit 5)	IRELAND Beam Trawl (Unit 6)	UK Gill-Net (Unit 3)	UK Trawl (Unit 4)	UK Trawl (Unit 5)	UK Beam Trawl (Unit 6)	FRANCE Gill-Net (Unit 3)	FRANCE Trawl (Unit 4)	FRANCE Trawl (Unit 5)	FRANCE Neph. Trawl (Unit 8)	FRANCE Trawl (Unit 10)	FRANCE Neph. Trawl (Unit 9)	FRANCE Trawl (Unit 14)	SPAIN Trawl (Unit 14)		
1986	369	344	326	429	1058	372	741		6031	708	1732		1408	500	1168	735	20360
1987	333	345	81	560	778	262	1286		5626	478	1321		1461	585	1572	648	19084
1988		227	144	643	684	305	1530		5482	332	1256		1235	640	1272	811	17732
1989	123	1102	521	481	201	456	1793	300	4936	677	1173		926	554	958	609	18569
1990*	555	835	213	416	334	385	1498	600	4736	640	1295		654	399	1305	799	18146
1991*	203	809	51	428	715	211	1090	1300	3527	1497	743		267	185	993	502	16054
1992*	1047	53	92	533	1014	181	903	1200	2134	1416	842		249	155	601	296	13235
1993*	941	207	223	441	619	234	1035	1300	1721	1364	970		578	147	548	274	13147
1994**	1364	526	582	377	560	236	912	1000	2945	1592	1352		321	151	1027	481	16077

* revised

** preliminary

5 Lophius budegassa in D
Landings in tonnes by fleet

*** revised**

**** preliminary**

Table 3.9.14.6 Anglerfish (*L.piscatorius*)in Division VIIb-k and VIIa,b

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-7
1986	12.01	59.29	20.36	0.294
1987	9.15	56.40	19.08	0.256
1988	9.37	47.96	17.73	0.324
1989	14.36	44.17	18.57	0.369
1990	32.26	42.59	18.15	0.413
1991	29.60	36.32	16.05	0.389
1992	28.85	30.92	13.24	0.335
1993	33.21	28.74	13.15	0.290
1994	16.98	30.44	16.08	0.379
Average	20.64	41.87	16.93	0.339
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.14.7 Anglerfish (*L. budegassa*)in Division VIIb-k and VIIa,b

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 4-8
1986	18.90	50.99	9.87	0.168
1987	16.43	51.72	7.94	0.150
1988	15.93	47.11	9.62	0.213
1989	15.43	51.03	9.70	0.157
1990	12.90	45.22	9.11	0.155
1991	14.14	43.64	8.64	0.180
1992	18.36	40.86	7.91	0.198
1993	15.89	32.98	6.25	0.166
1994	15.89	32.29	5.80	0.179
Average	15.99	43.98	8.32	0.174
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.9.15 a.1 *Nephrops* Landings (tonnes) by Functional Unit plus Other rectangles in Management Area M (VIIIf,g,h, & VIIa rectangles 33E2-E5)

Year	FU 20-22	Other	Total
1985	3824	24	3848
1986	2800	5	2805
1987	3135	236	3371
1988	2913	156	3069
1989	3881	107	3988
1990	4306	75	4381
1991	3311	20	3331
1992	4240	29	4269
1993	4632	42	4674
1994	4605	75	4680

Table 3.9.15 a.2 Total *Nephrops* Landings (tonnes) by country in Management Area M (VLLf,g,h & VIIa rectangles 33E2-E5)

Year	France	Ireland	UK	Belgium	Total
1985	3623	222	3	?	3848
1986	2638	167	<1	0	2805
1987	3041	329	1	0	3371
1988	2827	239	3	0	3069
1989	3185	784	19	<1	3988
1990	3834	528	18	1	4381
1991	2670	644	15	2	3331
1992	3440	750	79	0	4269
1993	3841	770	63	0	4674
1994	3645	953	82	0	4680

Table 3.9.15 a.3 *Nephrops* in Divisions VIIf,g,h and VIIa Rectangles 33E2-E5

Year	Landings
1984	3,945
1985	3,848
1986	2,805
1987	3,371
1988	3,069
1989	3,988
1990	4,381
1991	3,331
1992	4,269
1993	4,674
1994	4,680
Average	3,851
Unit	tonnes

Table 3.9.15 b.1 *Nephrops* Landings (tonnes) by Functional Unit plus Other rectangles in Management Area N (VIIIab)

Year	FU 23	FU 24	Other	Total
1985	4281	312		4593
1986	3968	367	99	4434
1987	5074	473	114	5661
1988	6019	658	137	6814
1989	4600	630	142	5372
1990	4603	358	88	5049
1991	4352	401	55	4808
1992	5123	558	47	5728
1993	4404	512	49	4965
1994	NA	NA	27	3638

Table 3.9.15 b.2 Total *Nephrops* Landings (tonnes) by country in Management Area N (VIIIab)

Year	France	Spain	Belgium	Total
1985	4593	?	?	4593
1986	4335	99	0	4434
1987	5597	64	0	5661
1988	6745	69	0	6814
1989	5295	77	0	5372
1990	4961	87	1	5049
1991	4753	55	<1	4808
1992	5681	47	0	5728
1993	4916	49	0	4965
1994	3611	27	<1	3638

Table 3.9.15 b.3 Nephrops in Divisions VIIIa,b

Year	Landings
1984	4,683
1985	4,593
1986	4,434
1987	5,661
1988	6,814
1989	5,372
1990	5,049
1991	4,808
1992	5,728
1993	4,965
1994	3,638
Average	5,068
Unit	tonnes

Table 3.10.2.1 Nominal landings of COD as reported to ICES (tonnes)**COD VIIb,c**

Country	1988	1989	1990	1991	1992	1993	1994
France	591	27,342 ^{*1}	16,366 ^{*1}	8,807 ^{*1}	223 [*]	12,058 ^{*1}	11,497 ^{*1}
Germany, Fed. Rep.	-	1	-	-	-	-	-
Ireland	388	915	795	612	507	357	289
Norway	2	9	29	11	39	+ [*]	7 [*]
UK (England & Wales)	23	9	12	35	64	14	29
UK (N. Ireland)	-	-	-	2	1	2	+
UK (Scotland)	5	33	300	173	145	73	93
Total	1,009						

^{*}Preliminary. ¹ Includes VIIId,e,f,g-k, VIII, IX, X, COPACE (EC).

Table 3.10.2.2 Nominal landings of WHITING as reported to ICES (tonnes).**WHITING VIIb,c**

Country	1988	1989	1990	1991	1992	1993	1994
France	113	19,771 ^{*1}	19,348 ^{*1}	10,006 ^{*1}	487 [*]	13,697 ^{*1}	18,614 ^{*1}
Germany, Fed. Rep.	+	-	-	-	-	-	-
Ireland	922	1,199	770	540	730	826	1,042
UK (England & Wales)	12	1	-	15	17	19	18
UK (N. Ireland)	+	-	-	-	+	2	2
UK (Scotland)	+	32	38	79	150	147	117
Total	1,047						

^{*}Preliminary.

Table 3.10.2.3 Nominal landings of PLAICE as reported to ICES (tonnes)**PLAICE VIIb,c**

Country	1988	1989	1990	1991	1992	1993	1994
France	9	1*	11*	9*	3*	5*	2*
Ireland	157	159	130	179	180	191	200
UK (England & Wales)	2	2	-	+	6	1	2
UK (Scotland)	+	13	91	3	3	1	3
Total	168						

*Preliminary.

Table 3.10.2.4 Nominal landings of SOLE as reported to ICES (tonnes).**SOLE VIIb,c**

Country	1988	1989	1990	1991	1992	1993	1994
France	2	+	-	5*	2*	2*	2*
Ireland	34	38	41	46	43	59	60
UK (England & Wales)	1	-	-	-	+	+	+
UK (Scotland)	-	-	+	-	+	-	-
Total	37						

*Preliminary.

Table 3.10.2.5 ICES Divisions VIIh-k International Landing Statistics

*Preliminary, **Include ICES Division VIIg

COD Landings, Divisions VIIh-k

Country	1988	1989	1990	1991	1992	1993	1994*
Belgium**	102	229	86	51	81	136	115
Denmark	+	-	-	+	-	-	-
France	1960	2137	1313	603	1056	866	480
Ireland	868	857	1064	1413	872	435	573
Norway	-	13	20	-	-	-	-
UK (England and Wales)	104	128	191	189	278	153	na
UK (Isle of Man)	-	-	-	-	-	-	na
UK (N. Ireland)	-	-	2	-	-	-	na
UK (Scotland)	2	-	122	19	13	4	na
UK							196
Total	3036	3364	2798	2275	2300	1594	1364

WHITING Landings, Divisions VIIh-k

Country	1988	1989	1990	1991	1992	1993	1994*
Belgium**	19	39	67	43	47	75	50
Denmark	-	-	-	-	-	-	-
France	777	753	529	367	306	300	251
Germany, Fed. Rep.	-	-	+	-	14	-	na
Ireland	1771	1483	1304	1068	1455	2977	2307
UK (England and Wales)	109	116	47	103	168	211	na
UK (Isle of Man)	-	-	-	-	-	-	na
UK (N. Ireland)	-	-	-	-	-	-	na
UK (Scotland)	1	-	27	12	8	12	na
UK							272
Total	2677	2391	1974	1593	1998	3575	2880

** Includes 57t reported as VII.

SOLE Landings, Divisions VIIh-k

Country	1988	1989	1990	1991	1992	1993	1994*
Belgium**	254	252	353	358	312	317	338
France	53	84	66	55	43	44	35
Ireland	182	206	266	306	255	237	115
UK (England and Wales)	166	177	144	232	214	209	na
UK (Isle of Man)	-	-	-	-	-	-	na
UK (N. Ireland)	-	-	-	-	-	-	na
UK (Scotland)	-	-	-	-	3	5	na
UK							170
Total	655	719	829	951	827	812	658

** Includes VIIg

PLAICE Landings, Divisions VIIh-k

Country	1988	1989	1990	1991	1992	1993	1994*
Belgium**	245	403	301	252	246	344	197
Denmark	+	+	-	+	-	+	-
France	135	229	77	173	185	66	26
Ireland	369	454	338	478	477	383	217
UK (England and Wales)	433	73	88	287	261	218	na
UK (Isle of Man)	-	-	-	-	-	-	na
UK (N. Ireland)	-	-	-	-	+	-	na
UK (Scotland)	1	-	1	+	7	7	na
UK							256
Total	1183	1159	805	1190	1176	1018	696

Table 3.10.3.1 Estimated Herring catches in tonnes in Divisions VIa (South) and VIIb,c, 1985–1994. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.

Country	1985	1986	1987	1988	1989
France	-	-	-	-	-
Germany, Fed.Rep.	-	-	-	-	-
Ireland	13,900	15,540	15,000	15,000	18,200
Netherlands	1,270	1,550	1,550	300	2,900
UK (N.Ireland)	-	-	5	-	-
UK (England + Wales)	-	-	51	-	-
UK Scotland	-	-	-	-	+
Unallocated	8,204	11,785	31,994	13,800	7,100
Total landings	23,374	28,785	48,600	29,100	28,200
Discards	-	-	-	-	1,000
Total catch	23,374	28,785	48,600	29,100	29,200

Country	1990	1991	1992	1993 ¹	1994 ¹
France	+	-	-	-	-
Germany, Fed.Rep.	-	-	250	-	-
Ireland	25,000	22,500	26,000	27,600	24,400
Netherlands	2,533	600	900	2,500	2,500
UK (N.Ireland)	80	-	-	-	-
UK (England + Wales)	-	-	-	-	50
UK (Scotland)	-	+	-	200	-
Unallocated	13,826	11,200	4,600	6,250	6,250
Total landings	41,439	34,300	31,750	36,550	33,200
Discards	2,530	3,400	100	250	700
Total catch	43,969	37,700	31,850	36,800	33,900

¹Provisional

Table 3.10.3.2 Herring in Divisions VIa (South) and VIIb,c.

Year	Landings
1970	20
1971	15
1972	23
1973	37
1974	37
1975	39
1976	33
1977	21
1978	20
1979	23
1980	30
1981	25
1982	19
1983	33
1984	27
1985	23
1986	29
1987	49
1988	29
1989	29
1990	44
1991	38
1992	32
1993	37
1994	34
Average	30
Unit	1000 tonnes

Table 3.10.4.1 *Nephrops* landings (tonnes) by Functional Unit plus other rectangles in Management Area L (VIIb,c,j,k)

Year	FU 16	FU 17	FU 18	FU 19	Other	Total
1985	3953	1989	22	674	208	6846
1986	2569	1045	8	474	135	4231
1987	2439	1177	9	727	170	4522
1988	2329	753	14	602	187	3885
1989	2108	828	11	653	143	3743
1990	1883	345	5	571	114	2918
1991	1613	519	0	865	196	3193
1992	1968	412	1	651	454	3486
1993	1895	369	10	675	425	3374
1994	1974	192	0	350	376	2892

Table 3.10.4.2 *Nephrops* landings (tonnes) by country in Management Area L (VIIb,c,j,k)

Year	Spain	France	Ireland	UK	Total
1985	2889	1505	2360	92	6846
1986	1542	1267	1320	102	4231
1987	1735	756	1764	267	4522
1988	1617	662	1305	301	3885
1989	1505	338	1827	73	3743
1990	1436	363	1060	59	2918
1991	1152	378	1519	144	3193
1992	1139	676	1351	320	3486
1993	1075	876	1248	175	3374
1994	1069	868	761	192	2892

Table 3.10.4.3 Nephrops in Divisions VIIb,c,j,k

Year	Landings
1984	4,773
1985	6,846
1986	4,231
1987	4,522
1988	3,885
1989	3,743
1990	2,918
1991	3,193
1992	3,486
1993	3,374
1994	2,892
Average	3,988
Unit	tonnes

Table 3.11.2.1 HAKE - SOUTHERN STOCK - Landings estimates ('000 t) for the Southern Hake Stock (Divisions VIIIc and IXa) by country and gear as determined by the Working Group, 1972-1994.

YEAR	Spain				Portugal		France	TOTAL STOCK
	Gillnet Volantas	Small Gillnet	Longline	Total Artisanal	Artisanal	Trawl		
1972	-	-	-	7.1	4.7	4.1	-	26.1
1973	-	-	-	8.5	6.5	7.3	0.2	34.8
1974	2.6	1.0	2.2	5.8	5.1	3.5	0.1	22.8
1975	3.5	1.3	3.0	7.8	6.1	4.3	0.1	29.5
1976	3.1	1.2	2.6	6.9	6.0	3.1	0.1	26.1
1977	1.5	0.6	1.3	3.4	4.5	1.6	0.2	15.5
1978	1.4	0.1	2.1	3.6	3.4	1.4	0.1	13.4
1979	1.7	0.2	2.1	4.0	3.9	1.9	-	17.0
1980	2.2	0.2	5.0	7.3	4.5	2.3	-	19.4
1981	1.5	0.3	4.6	6.4	4.1	1.9	-	16.5
1982	1.3	0.4	5.3	7.0	5.0	2.5	-	18.9
1983	1.5	0.9	7.2	9.6	5.2	2.9	-	24.6
1984	1.6	0.8	8.2	10.6	4.3	1.2	-	21.0
1985	1.8	0.8	4.4	7.0	3.8	2.0	-	18.1
1986	2.1	0.8	3.5	6.4	3.2	1.8	0.0	16.2
1987	2.0	0.5	4.4	6.9	3.5	1.3	0.0	15.2
1988	2.0	0.7	3.0	5.7	4.3	1.7	0.0	15.4
1989	1.9	0.6	1.9	4.4	2.7	1.8	0.0	12.9
1990	1.7	0.6	2.1	4.4	2.3	1.1	0.0	12.0
1991	1.4	0.4	2.2	4.0	2.7	1.2	0.0	11.6
1992	1.5	0.4	2.1	3.9	3.8	1.3	0.0	12.8
1993	1.3	0.4	2.8	4.4	3.0	0.9	0.0	10.9
1994	1.9	0.4	1.5	3.7	2.3	0.8	0.0	9.5

Table 3.11.2.2 Hake - Southern stock (Divisions VIIIc and IXa).

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1982	139.36	53.49	18.84	0.274
1983	114.37	50.41	24.61	0.419
1984	138.06	55.49	21.03	0.275
1985	99.66	37.28	18.15	0.341
1986	105.67	23.83	16.19	0.413
1987	97.46	24.26	15.23	0.388
1988	83.95	26.41	15.41	0.333
1989	54.53	24.41	12.89	0.359
1990	54.24	24.16	11.99	0.307
1991	54.87	22.82	11.62	0.280
1992	37.20	24.82	12.82	0.357
1993	65.14	22.56	10.94	0.245
1994	69.70	16.63	9.54	0.292
Average	85.71	31.27	15.33	0.330
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.11.3.a.1 Four Spot Megrim (*L. boscii*) in Divisions VIIIc, IXa. Total landings (t).

Year	Spain			Portugal	Total
	VIIIc	IXa	Total	IXa	VIIIc, IXa
1986	799	197	996	128	1124
1987	995	586	1581	107	1688
1988	917	1099	2016	207	2223
1989	805	1548	2353	276	2629
1990	927	798	1725	220	1945
1991	841	634	1475	207	1682
1992	654	938	1592	324	1916
1993	744	419	1163	221	1384
1994	665	561	1227	176	1403

Table 3.11.3.a.2 Megrim (*L. boscii*) in Divisions VIIIc and IXa.

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-4
1986	50.14	3.86	1.12	0.297
1987	45.40	4.58	1.69	0.343
1988	28.26	5.58	2.22	0.374
1989	31.92	5.61	2.63	0.482
1990	29.85	5.29	1.95	0.311
1991	19.31	4.89	1.68	0.259
1992	42.86	4.35	1.92	0.459
1993	29.00	4.53	1.38	0.322
1994	4.12	4.32	1.40	0.300
Average	31.20	4.78	1.78	0.350
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.11.3.b.1 Megrim (*L. whiffiagonis*) in Divisions VIIIc, IXa. Total landings (t).

Year	Spain			Portugal	Total
	VIIIc	IXa	Total	IXa	VIIIc, IXa
1986	508	98	606	53	659
1987	404	46	450	47	497
1988	657	59	716	101	817
1989	533	45	578	136	714
1990	841	25	866	111	977
1991	494	16	510	104	614
1992	474	5	479	37	516
1993	338	7	345	38	383
1994	440	8	448	31	479

Table 3.11.4.1 Anglerfish (*L. piscatorius*) - Divisions VIIIc and IXa. Tonnes landed by fishing fleets between 1978-1994, as determined by the Working Group.

YEAR	DIVISION VIIIc			DIVISION IXa			TOTAL IXa VIIIc+IXa	TOTAL
	Spain Trawl	Spain Gillnet	TOTAL VIIIc	Spain Trawl	Portugal Trawl	Portugal Artisanal		
1978	n/a	n/a	n/a	258	0	115	373	373
1979	n/a	n/a	n/a	319	0	225	544	544
1980	2806	1270	4076	401	0	339	740	4816
1981	2750	1931	4681	535	0	352	887	5568
1982	1915	2682	4597	875	0	310	1185	5782
1983	3205	1723	4928	726	0	460	995	5923
1984	3086	1690	4776	578	186	492	1256	6032
1985	2313	2372	4685	540	212	702	1454	6139
1986	2499	2624	5123	670	167	910	1747	6870
1987	2080	1683	3763	320	194	864	1378	5141
1988	2525	2253	4778	570	157	817	1543	6321
1989	1643	2147	3790	347	259	600	1206	4996
1990	1439	985	2424	435	326	606	1366	3790
1991	1490	778	2268	319	224	829	1372	3640
1992	1217	1011	2228	301	76	778	1154	3382
1993	844	666	1510	72	111	636	819	2329
1994	690	827	1517	154	70	266	490	2007

Table 3.11.4.2 Anglerfish *L. budegassa*, Division VIIIc and IXa. Tonnes landed by fishing fleets between 1978-1994, as determined by the Working Group.

YEAR	DIVISION VIIIc			DIVISION IXa			TOTAL IXa	TOTAL VIIIc+IXa
	Spain Trawl	Spain Gillnet	TOTAL VIIIc	Spain Trawl	Portugal Trawl	Portugal Artisanal		
1978	n/a	n/a	n/a	248	0	107	355	355
1979	n/a	n/a	n/a	306	0	210	516	516
1980	1203	207	1409	385	0	315	700	2110
1981	1159	309	1468	505	0	327	832	2300
1982	827	413	1240	841	0	288	1129	2369
1983	1064	188	1252	699	0	428	1127	2379
1984	514	176	690	558	223	458	1239	1929
1985	366	123	489	437	254	653	1344	1833
1986	553	585	1138	379	200	847	1425	2563
1987	1094	888	1982	813	232	804	1849	3832
1988	1058	1010	2068	684	188	760	1632	3700
1989	648	351	999	764	272	542	1579	2578
1990	491	142	633	689	387	625	1701	2334
1991	503	76	579	559	309	716	1584	2163
1992	451	57	508	485	287	832	1603	2111
1993	516	292	809	627	196	596	1418	2227
1994	542	201	743	475	79	283	837	1580

Table 3.11.6.1 Landings (t) of HORSE MACKEREL in Sub-area VIII by country. (Data submitted by Working Group members).

Country	1980	1981	1982	1983	1984
Denmark	-	-	-	-	-
France	3,361	3,711	3,073	2,643	2,489
Netherlands	-	-	-	-	²
Spain	34,134	36,362	19,610	25,580	23,119
UK (Engl. + Wales)	-	+	1	-	1
USSR	-	-	-	-	20
Total	37,495	40,073	22,683	28,223	25,629

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Denmark	-	446	3,283	2,793	6,729	5,726	1,349	5,778	1,955	-
France	4,305	3,534	3,983	4,502	4,719	5,082	6,164	6,220	4,010	28
Germany	-	-	-	-	-	-	80	62	-	-
Netherlands	²	²	²	-	-	6,000	12,437	9,339	19,000	7,272
Spain	23,292	40,334	30,098	26,629	27,170	25,182	23,733	27,688	27,921	25,409
UK (Engl. + Wales)	143	392	339	253	68	6	70	88	123	753
USSR	-	656	-	-	-	-	-	-	-	-
Unallocated + discards	-	-	-	-	-	1,500	2,563	5,011	700	2,038
Total	27,740	45,362	37,703	34,177	38,686	43,496	46,396	54,186	53,709	35,500

¹Preliminary.

²Included in Sub-area VII.

Table 3.11.6.2 Annual catches (tonnes) of SOUTHERN HORSE MACKEREL by countries by gear in Divisions VIIIc and IXa. Data from 1984-1994 are Working Group estimates.

Year	Portugal (Division IXa)				Spain (Divisions IXa + VIIIc)					Total VIIIc+IXa	
	Trawl	Seine	Artisanal	Total	Trawl	Seine	Hook	Gillnet	Total		
1962	7,231	46,345	3,400	56,976	-	-	-	-	53,202	110,778	
1963	6,593	54,267	3,900	64,760	-	-	-	-	53,420	118,180	
1964	8,983	55,693	4,100	68,776	-	-	-	-	57,365	126,141	
1965	4,033	54,327	4,745	63,105	-	-	-	-	52,282	115,387	
1966	5,582	44,725	7,118	57,425	-	-	-	-	47,000	104,425	
1967	6,726	52,643	7,279	66,648	-	-	-	-	53,351	119,999	
1968	11,427	61,985	7,252	80,664	-	-	-	-	62,326	142,990	
1969	19,839	36,373	6,275	62,487	-	-	-	-	85,781	148,268	
1970	32,475	29,392	7,079	59,946	-	-	-	-	98,418	158,364	
1971	32,309	19,050	6,108	57,467	-	-	-	-	75,349	132,816	
1972	45,452	28,515	7,066	81,033	-	-	-	-	82,247	163,280	
1973	28,354	10,737	6,406	45,497	-	-	-	-	114,878	160,375	
1974	29,916	14,962	3,227	48,105	-	-	-	-	78,105	126,210	
1975	26,786	10,149	9,486	46,421	-	-	-	-	85,688	132,109	
1976	26,850	16,833	7,805	51,488	89,197	26,291	376 ¹	-	115,864	167,352	
1977	26,441	16,847	7,790	51,078	74,469	31,431	376 ¹	-	106,276	157,354	
1978	23,411	4,561	4,071	32,043	80,121	14,945	376 ¹	-	95,442	127,485	
1979	19,331	2,906	4,680	26,917	48,518	7,428	376 ¹	-	56,322	83,239	
1980	14,646	4,575	6,003	25,224	36,489	8,948	376 ¹	-	45,813	71,037	
1981	11,917	5,194	6,642	23,733	28,776	19,330	376 ¹	-	48,482	72,235	
1982	12,676	9,906	8,304	30,886	- ²	- ²	- ²	-	28,450	59,336	
1983	16,768	6,442	7,741	30,951	8,511	34,054	797	-	43,362	74,313	
1984	8,603	3,732	4,972	17,307	12,772	15,334	884	-	28,990	46,297	
1985	3,579	2,143	3,698	9,420	16,612	16,555	949	-	34,109	43,529	
1986	- ²	- ²	- ²	28,526	9,464	32,878	481	143	42,967	71,493	
1987	11,457	6,744	3,244	21,445	- ²	- ²	- ²	- ²	33,193	54,648	
1988	11,621	9,067	4,941	25,629	- ²	- ²	- ²	- ²	30,763	56,392	
1989	12,517	8,203	4,511	25,231	- ²	- ²	- ²	- ²	31,170	56,401	
1990	10,060	5,985	3,913	19,958	10,876	17,951	262	158	29,247	49,205	
1991	9,437	5,003	3,056	17,497	9,681	18,019	187	127	28,014	45,511	
1992	12,189	7,027	3,438	22,654	11,146	16,972	81	103	28,302	50,956	
1993	14,706	4,679	6,363	25,747	14,506	16,897	124	154	31,681	57,428	
1994	10,494	5,366	3,201	19,061	10,864	22,382	145	136	33,527	52,588	

¹Estimated value.

²Not available by gear.

Table 3.11.6.3 Catches (t) of *Trachurus trachurus* and *Trachurus mediterraneus* in Divisions VIIIb, VIIIc and IXa. in the period 1989-1994.

	Divisions	Sub-Divisions	1989	1990	1991	1992	1993	1994
<i>T. trachurus</i>	VIIIb		2904	4306	4030	3445	2431	1262
	VIIIc	VIIIc East	8478	7505	4907	8299	11519	9697
		VIIIc west	17802	17676	18827	15945	13963	14451
		Total	26280	25181	23734	24244	25482	24148
	IXa	IXa North	13028	4065	4275	4059	6198	9380
		IXa C, N & S	25231	19958	14497	22653	25747	19061
		Total	38259	24023	18772	26712	31945	28441
<i>T. mediterraneus</i>	VIIIb (Spain)		23	298	2122	1123	649	1573
	VIIIc	VIIIc East	3903	2943	5020	4804	5576	3344
		VIIIc west	0	0	0	0	0	0
		Total	3903	2943	5020	4804	5576	3344
	IXa	IXa North	0	0	0	0	0	0
		IXa C, N & S	0	0	0	0	0	0
		Total	0	0	0	0	0	0

Table 3.11.6.4 Catches (t) and percentages (%) of *Trachurus mediterraneus* in relation to total landings of *Trachurus trachurus* in Divisions VIIIb and VIIIc in 1994.

Divisions	Sub-Divisions	<i>Trachurus mediterraneus</i>						<i>T. trachurus</i>
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total		Total
		(t)	(t)	(t)	(t)	(t)	%	(t)
VIIIb		416	422	326	409	1573	55.5	1262
VIIIc	VIIIc East	884	172	759	1529	3344	25.6	9697
	East of 3°W	606	118	353	871	1949	44.1	2468
	West of 3°W	278	53	406	658	1395	16.2	7229

Table 3.11.6.5 Catches (t) of *Trachurus trachurus* and *Trachurus picturatus* in ICES Division IXa, Sub-area X, and in CECAF Division 34.1 in the period 1986-1994.

		1986	1987	1988	1989	1990	1991	1992	1993	1994
<i>Trachurus trachurus</i> (*)	Div. IXa	28,526	19,554	25,125	25,226	19,959	17,497	22,653	25,747	19,061
<i>Trachurus picturatus</i>	Div. IXa	367	181	2,370	2,394	2,012	1,700	1,035	1,028	1,045
	Div. X Azorean area	3,331	3,020	3,079	2,866	2,510	1,274	1,255	1,732	1,778
	34.1.1 Madeira's area	2,006	1,533	1,687	1,564	1,863	1,161	792	530	297

(*) As estimated by the Working Group.

Table 3.11.6.6 Southern horse mackerel (Divisions VIIIc and IXa).

Year	Recruitment Age 0	Spawning Stock Biomass	Fishing Landings	Mortality Age 1-11
1985	1,633.36	112.11	43.54	0.208
1986	2,665.09	162.04	71.26	0.333
1987	1,319.47	180.95	52.75	0.225
1988	1,098.24	184.56	55.89	0.286
1989	973.28	181.00	56.40	0.322
1990	688.57	191.48	49.21	0.256
1991	2,771.83	196.10	45.51	0.227
1992	1,600.37	191.74	50.96	0.262
1993	1,728.58	180.93	57.43	0.281
1994	812.12	159.48	52.59	0.216
Average	1,529.09	174.04	53.55	0.262
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.11.7.1 Annual landings (t) of SARDINE in Divisions VIIIc and IXa by country.

Country	1976	1977	1978	1979	1980	1981
Portugal	79,649	79,819	83,553	91,294	106,302	113,253
Spain	62,041	45,931	56,437	62,147	85,380	100,880
Total	141,690	125,750	139,990	153,441	191,682	214,133

	1982	1983	1984	1985	1986	1987
Portugal	100,859	85,922	95,110	111,709	103,451	90,214
Spain	103,645	95,217	107,576	92,398	77,155	78,611
Total	204,504	181,139	202,686	204,107	180,606	168,825

	1988	1989	1990	1991	1992	1993	1994	1995 ²
Portugal	93,591	91,091	92,404	92,638 ¹	83,315	90,404	94,468	31,353
Spain	64,949	46,035	46,753	35,118	42,739	48,391	38,332	12,512
Total	158,540	137,126	139,157	127,756	126,054	138,795	132,800	43,865

¹Discards included.

²Preliminary landings from 1 September.

Table 3.11.7.2 Sardine in Divisions VIIIc and IXa.

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-5
1976	11,808.00	474.00	141.69	0.202
1977	11,835.00	478.52	125.75	0.123
1978	13,057.00	496.43	139.99	0.185
1979	15,218.00	505.55	153.44	0.256
1980	16,193.00	544.23	191.68	0.246
1981	11,008.00	581.10	214.13	0.316
1982	7,403.00	568.14	204.50	0.378
1983	22,607.00	508.13	181.14	0.334
1984	8,878.00	542.65	202.69	0.261
1985	6,439.00	598.68	204.11	0.313
1986	5,249.00	537.88	180.61	0.374
1987	10,798.00	436.06	168.83	0.385
1988	5,915.00	376.71	158.54	0.394
1989	5,617.00	313.56	137.13	0.437
1990	5,786.00	278.59	139.16	0.551
1991	15,081.00	277.48	127.76	0.406
1992	7,610.00	399.37	126.05	0.332
1993	1,070.00	421.23	138.80	0.440
1994	1,606.00	320.28	132.80	0.410
Average	9,640.95	455.71	161.51	0.334
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.11.8.a.1 Annual catches (in tonnes) of Bay of Biscay anchovy (Subarea VIII)
As estimated by the Working Group.

YEAR	COUNTRY		TOTAL
	FRANCE	SPAIN	
	VIIIab	VIIIbc	VIII
1960	1085	57000	58085
1961	1494	74000	75494
1962	1123	58000	59123
1963	652	48000	48652
1964	1973	75000	76973
1965	2615	81000	83615
1966	839	47519	48358
1967	1812	39363	41175
1968	1190	38429	39619
1969	2991	33092	36083
1970	3665	19820	23485
1971	4825	23787	28612
1972	6150	26917	33067
1973	4395	23614	28009
1974	3835	27282	31117
1975	2913	23389	26302
1976	1095	36166	37261
1977	3807	44384	48191
1978	3683	41536	45219
1979	1349	25000	26349
1980	1564	20538	22102
1981	1021	9794	10815
1982	381	4610	4991
1983	1911	12242	14153
1984	1711	33468	35179
1985	3005	8481	11486
1986	2311	5612	7923
1987	5061	9863	14924
1988	6743	8266	15009
1989	2200	8174	10374
1990	10598	23258	33856
1991	9708	9573	19281
1992	15207	22468	37675
1993	20914	19173	40087
1994	16993	17554	34547
1995	3700	18116	21816 (*)
AVERAGE (1960-94)	4309	30182	34491

(*) Preliminary data for the first half of the year

Table 3.11.8.b.1. Portuguese and Spanish annual landings of anchovy in Division IXa (From Pestana, 1989 and Working Group members).

Year	Portugal	Spain		TOTAL
	IXa CN,C & S	IXa North	IXa South	
1943	9975	-	-	
1944	6651	-	-	
1945	992	-	-	
1946	6520	-	-	
1947	3392	-	-	
1948	4938	-	-	
1949	2684	-	-	
1950	3377	-	-	
1951	3594	-	-	
1952	4415	-	-	
1953	1033	-	-	
1954	3919	-	-	
1955	4523	-	-	
1956	7898	-	-	
1957	12610	-	-	
1958	3030	-	-	
1959	3788	-	-	
1960	9503	-	-	
1961	2492	-	-	
1962	4446	-	-	
1963	5714	-	-	
1964	4118	-	-	
1965	4460	-	-	
1966	4460	-	-	
1967	3818	-	-	
1968	970	-	-	
1969	1243	-	-	
1970	1172	-	-	
1971	326	-	-	
1972	207	-	-	
1973	126	-	-	
1974	238	-	-	
1975	372	-	-	
1976	88	-	-	
1977	3261	-	-	
1978	1011	-	-	
1979	655	-	-	
1980	980	-	-	
1981	978	-	-	
1982	656	-	-	
1983	673	-	-	
1984	392	-	-	
1985	2122	-	-	
1986	2153	-	-	
1987	1622	-	-	
1988	442	-	4263	4705
1989	823	-	5336	6159
1990	541	-	5911	6452
1991	210	15	5696	5921
1992	138	33	2995	3166
1993	23	1	1960	1984
1994	236	117	3036	3389
1995	2660*	968 *	-	

- Not available

* Preliminary data for the first half of the year

Table 3.11.9 a.1 *Nephrops* landings (tonnes) by Functional Unit plus other rectangles in Management Area O (VIIIc)

Year	FU 25	FU 31	Other	Total
1985	477	128		605
1986	364	127		491
1987	412	118		530
1988	445	151		596
1989	376	139		515
1990	285	172		457
1991	453	109		562
1992	428	94		522
1993	274	91		365
1994	245	148		393

Table 3.11.9 a.2 *Nephrops* Landings (tonnes) by country in Management Area O (VIIIc)

Year	Spain	Total
1985	605	605
1986	491	491
1987	530	530
1988	596	596
1989	515	515
1990	457	457
1991	562	562
1992	522	522
1993	365	365
1994	393	393

Table 3.11.9 a.3 *Nephrops* in Division VIIIc.

Year	Landings
1984	615
1985	605
1986	491
1987	530
1988	596
1989	515
1990	457
1991	562
1992	522
1993	365
1994	393
Average	514
Unit	tonnes

Table 3.11.9 b.1*Nephrops* Landings (tonnes) by Functional Unit plus other rectangles in Management Area Q (IXa)

Year	FU 26	FU 27	FU 28&29	FU 30	Other	Total
1985	731	15	509	257		1512
1986	655	37	465	221		1378
1987	671	71	509	302		1553
1988	631	96	420	139		1286
1989	620	88	469	174		1351
1990	401	48	524	220		1193
1991	549	54	478	226		1307
1992	584	52	470	243		1349
1993	472	50	376	160		1058
1994*	426	22	318	107		873

Table 3.11.9 b.2 Total *Nephrops* Landings (tonnes) by country in Management Area Q (IXa)

Year	Portugal	Spain	Total
1985	524	1007	1531
1986	502	878	1380
1987	580	973	1553
1988	516	779	1295
1989	557	800	1357
1990	572	621	1193
1991	533	774	1307
1992	522	827	1349
1993	426	632	1058
1994	340	533	873

Table 3.11.9 b.3

Nephrops in Division IXa.

Year	Landings
1984	1,079
1985	1,531
1986	1,380
1987	1,553
1988	1,295
1989	1,357
1990	1,193
1991	1,307
1992	1,349
1993	1,058
1994	873
Average	1,270
Unit	tonnes

Table 3.12.2.1 Nominal landings of HAKE as reported to ICES (tonnes)**HAKE IIIa**

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	5	3	13	15	15	5	4
Denmark	576	952	1,584	1,623	1,546	1,188	791*
Germany, Fed. Rep.	-	-	-	-	-	1	+
Netherlands	1	-	-	-	-	-	-
Norway	60	56	113	115	154	121*	58*
Sweden	38	50	98	103	141	162	121*
Total	680	1,061	1,808	1,856	1,856	1,477	974

*Preliminary.

HAKE IVa

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	+	+	+	+	1	1	1
Denmark	232	245	336	343	322	478	233*
Faroe Islands	-	-	-	-	-	6	4*
France	380	585 ^{1*}	748 ^{1*}	134 ^{1*}	109*	151 ^{1*}	77 ^{1*}
Germany, Fed. Rep.	30	29	9	19	28	70	51
Netherlands	+	8	1	4	18	4	+
Norway	202	269	420	505	442	459*	241*
Sweden ^{a)}	33	24	41	138	60	38	30
UK (England & Wales)	67	4	9	13	23	5	3
UK (Isle of Man)	-	-	-	-	+	-	-
UK (N. Ireland)	3	+	-	-	+	-	-
UK (Scotland)	353	188	235	360	412	460	316
Total	1,300						

*Preliminary. ^{a)}Includes IVb 1988-1993. ¹⁾Includes IIa(EC) and IVb,c.

Table 3.12.2.1 (Cont'd)

HAKE IVb

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	32	25	78	115	116	69	55
Denmark	790 ¹	860 ²	934 ³	1,374 ⁴	1,500	1,512	1,103 ^{5*}
France	1	... ^{a)*}	... ^{a)*}	... ^{a)*}	12 [*]	... ^{a)*}	... ^{a)*}
Germany, Fed. Rep.	8	5	13	11	22	48	28
Netherlands	149	117	89	81	162	135	74
Norway	2	2	2	8	2	+ [*]	4 [*]
Sweden ^{a)}	...	...	...	...	...	...	19
UK (England & Wales)	18	15	16	24	47	30	33
UK (Isle of Man)	-	-	-	-	+	-	-
UK (N. Ireland)	-	-	-	+	+	1	1
UK (Scotland)	34	31	30	54	37	22	27
Total	1,034						

*Preliminary. ^{a)}Included in IVa 1988-1993. ¹Includes 12 t reported as Sub-area IV. ²Includes 4 t reported as Sub-area IV. ³Includes 11 t reported as Sub-area IV. ⁴Includes 7 t reported as Sub-area IV. ⁵Includes 3 t reported as Sub-area IV.

HAKE IVc

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	6	5	1	2	1	2	1
Denmark	+	+	1	1	+	+	+ [*]
France	-	... ^{1*}	... ^{1*}	... ^{1*}	1 [*]	... ^{1*}	... ^{1*}
Germany, Fed. Rep.	-	-	-	-	-	+	+
Netherlands	4	-	1	1	2	1	1
UK (England & Wales)	2	1	-	1	4	+	1
UK (Scotland)	-	-	+	+	+	+	-
Total	12						

*Preliminary. ¹Included in IVa.

Table 3.12.2.1 (Cont'd)

HAKE VIa

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	2	2	-	+	-	1	+
Denmark	+	+	+	+	+	1	+*
France	1,909	9,417 ^{1*}	6,539 ^{1*}	3,162 ^{1*}	1,197*	3,261 ^{1*}	2,500 ^{1*}
Germany, Fed. Rep.	2	2	+	+	+	1	+
Ireland	265	730	207	151	241	251	244
Netherlands	-	-	14	3	-	-	-
Norway	5	1	+	+	+	+*	1*
Spain	1,340						
UK (England & Wales)	1,169	506	279	497	452	467	507
UK (Isle of Man)	-	+	-	-	+	-	-
UK (N. Ireland)	83	77	115	278	283	173	117
UK (Scotland)	1,329	1,380	1,399	1,692	1,340	1,392	1,079
Total	6,104						

*Preliminary. ¹Includes Vb(EC), VIb and VII.

HAKE VIb

Country	1988	1989	1990	1991	1992	1993	1994
France	-	...	...	...	-	...	...
Ireland	-	-	115	76	102	1	+
Norway	-	-	+	1	-	+*	+*
Spain	1,336						
UK (England & Wales)	75	8	16	1	7	35	22
UK (N. Ireland)	-	+	+	3	+	1	-
UK (Scotland)	5	6	12	15	7	19	25
Total	1,416						

*Preliminary. ¹Included in VIa.

Table 3.12.2.1 (Cont'd)

HAKE VIIa

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	17	19	16	6	10	7	5
France	187	... ^{1*}	... ^{1*}	... ^{1*}	61 [*]	... ^{1*}	... ^{1*}
Ireland	237	321	106	85	122	242	225
UK (England & Wales)	186	284	139	77	95	154	542
UK (Isle of Man)	2	7	8	15	7	7	25
UK (N. Ireland)	523	1,024	1,336	1,042	736	644	479
UK (Scotland)	202	117	84	68	35	54	52
Total	1,354						

*Preliminary. ¹Included in VIa.

HAKE VIIb,c

Country	1988	1989	1990	1991	1992	1993	1994
France	478	... ^{1*}	... ^{1*}	... ^{1*}	69 [*]	... ^{1*}	... ^{1*}
Germany, Fed. Rep.	-	-	-	-	-	-	6
Ireland	128	89	219	133	196	424	250
Netherlands	-	-	-	7	-	4	-
Norway	-	-	+	+	1	- [*]	- [*]
Spain	4,033						
UK (England & Wales)	859	207	157	223	598	471	373
UK (N. Ireland)	2	-	-	1	2	12	1
UK (Scotland)	8	3	10	38	116	172	142
Total	5,508						

*Preliminary. ¹Included in VIa.

HAKE VIId

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	26	1	1	2	3	1	2
Denmark	-	-	-	-	+	-	+ [*]
France	4	... ^{1*}	... ^{1*}	... ^{1*}	4 [*]	... ^{1*}	... ^{1*}
UK (England & Wales)	2	3	3	3	1	1	5
UK (Scotland)	-	-	-	-	+	+	+
Total	32						

*Preliminary. ¹Included in VIa.

Table 3.12.2.1 (Cont'd)

HAKE VIIe

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	3	3	1	+	+	1	+
Denmark	-	-	-	-	-	-	+*
France	1,185	... ^{1*}	... ^{1*}	... ^{1*}	503*	... ^{1*}	... ^{1*}
Ireland	-	-	-	11	11	-	-
UK (England & Wales)	329	353	439	506	293	266	253
UK (Scotland)	-	1	9	-	+	1	-
Total	1,517						

*Preliminary. ¹Included in VIa.

HAKE VIII

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	30	35	28	10	12	10	11
France	551	... ^{1*}	... ^{1*}	... ^{1*}	296*	... ^{1*}	... ^{1*}
Ireland	-	-	26	16	30	-	-
UK (England & Wales)	505	502	296	265	174	295	235
UK (Isle of Man)	-	-	-	3	+	-	-
UK (N. Ireland)	-	-	-	1	-	-	-
UK (Scotland)	-	16	9	6	-	+	-
Total	1,086						

*Preliminary. ¹Included in VIa.

HAKE VIIg-k

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	16	29	19	8	11	13	9
Denmark	+	-	+	+	-	-	-*
France	3,332	... ^{1*}	... ^{1*}	... ^{1*}	1,579*	... ^{1*}	... ^{1*}
Ireland	1,331	965	1,593	1,301	1,812	1,621	1,456
Netherlands	-	4	-	15	-	-	-
Norway	-	-	+	-	-	-*	-*
Spain	5,229						
UK (England & Wales)	2,539	1,189	1,499	2,274	2,730	2,318	2,233
UK (Isle of Man)	-	-	+	-	-	-	-
UK (N. Ireland)	+	+	2	1	1	12	1
UK (Scotland)	1	9	17	214	166	302	267
Total	12,448						

*Preliminary. ¹Included in VIa.

Table 3.12.2.1 (Cont'd)

HAKE VIII

Country	1988	1989	1990	1991	1992	1993	1994
Belgium	2	15	8	12	13	7	
Denmark	-	-	-	-	+	-	
France	13,853	13,678 ^{1*}	12,979 ^{2*}	15,607 ^{3*}	11,426 ^{4*}	8,972 ^{5*}	11,8
Ireland	-	2	-	-	-	-	
Netherlands	-	-	28	-	-	-	
Portugal	23	21	20	23	37	16	
Spain	13,630						
UK (England & Wales)	2	-	-	-	+	-	
Total	27,510						

*Preliminary. ¹VIIIa,b,d,e 13,663 t; VIIIc, IX, X, COPACE(EC) 15 t. ²VIIIa,b,d,e 12,977 t; VIIIc, IX, X COPACE (EC) 2 t. ³VIIIa,b,d,e 15,591 t; VIIIc, IX, X, COPACE(EC) 16 t. ⁴VIIIa,b 11,284 t, VIIIc 19 t, VIId 119 t and VIIE 4 t.

⁵VIIIa,b,d,e 8,957 t; VIIIc, IX, X, COPACE(EC) 15 t. ⁶VIIIa,b,d,e 11,688 t; VIIIc, IX, X, COPACE(EC) 166 t.

HAKE IX

Country	1988	1989	1990	1991	1992	1993	1994
Portugal	5,469	3,111	3,074	3,564	4,582	2,647	2,184
Spain	6,060						
Total	11,529						

*Preliminary.

Table 3.12.2.2 Hake - Northern Stock (Division IIIa, Sub-areas IV, VI and VII, and Divisions VIIIa,b.

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 1-4
1978	313.62	176.64	50.55	0.277
1979	328.81	170.85	51.10	0.249
1980	445.91	176.94	57.27	0.263
1981	325.64	185.07	53.92	0.241
1982	309.63	189.41	55.00	0.333
1983	296.81	199.12	57.51	0.331
1984	289.47	198.31	63.29	0.247
1985	519.89	190.33	56.43	0.166
1986	264.81	209.53	57.09	0.235
1987	270.93	209.12	63.37	0.212
1988	332.72	182.74	64.82	0.206
1989	236.40	179.06	66.47	0.256
1990	340.44	164.95	59.88	0.275
1991	300.00	161.89	57.59	0.272
1992	343.46	138.20	56.62	0.296
1993	281.75	130.27	52.15	0.215
1994	251.76	122.57	51.26	0.309
Average	320.71	175.59	57.31	0.258
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.12.3.1 Catches (t) of MACKEREL in the Norwegian Sea (Division IIa) and off the Faroes (Division Vb), 1982-1994. (Data submitted by Working Group members).

Country	1982	1983	1984	1985	1986	1987 ¹
Denmark	1,008	10,427	11,787	7,610	1,653	3,133
Faroe Islands	180	-	137	-	-	-
France	8	-	-	16	-	-
Germany, Fed. Rep.	-	5	-	-	99	-
German Dem. Rep.	-	-	-	-	16	292
Norway	34,540	38,453	82,005	61,065	85,400	25,000
Poland	231	-	-	-	-	-
UK (England & Wales)	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	2,131	157
USSR	1,641	65	4,292	9,405	11,813	18,604
Discards	-	-	-	-	-	-
Total	37,608	48,950	98,222	78,096	101,112	47,186

Country	1988 ¹	1989	1990	1991	1992	1993 ²	1994 ²
Denmark	4,265	6,433	6,800	1,098	251	-	-
Estonia					216	-	3,302
Faroe Islands	22	1,247	3,100	5,793	3,347	1,167	6,258
France	-	11	-	23	6	6	5
Germany, Fed. Rep.	380	-	-	-	-	-	-
German Dem. Rep.	-	2,409	-	-	-	-	-
Latvia					100	4,700	1,508
Norway	86,400	68,300	77,200	76,760	91,900	110,500	140,708
Poland	-	-	-	-	-	-	-
Russia					42,440	49,600	26,038
UK (England & Wales)	-	-	+	-	1	-	20
UK (Scotland)	1,413	-	400	514	801	-	1,686
USSR	27,924	12,088	30,000	13,631 ³	-	-	-
Misreported ¹							109,625
Discards	-	-	2,300	-	-	-	-
Total	120,404	90,488	118,700	97,819	139,062	165,973	69,900

¹Includes catches probably taken in the northern part of Division IVa.

²Preliminary.

³Russia.

Table 3.12.3.2 Catch (t) of MACKEREL in the North Sea, Skagerrak, and Kattegat (Sub-area IV and Division IIIa), 1982–1994. (Data submitted by Working Group members).

Country	1982	1983	1984	1985	1986	1987 ¹
Belgium	102	93	68	-	49	14
Denmark	2,034	11,285	10,088	12,424	23,368	28,217
Faroe Islands	720	-	-	1,356	-	-
France	3,041	2,248	-	322	1,200	2,146
Germany, Fed. Rep.	28	10	112	217	1,853	474
Ireland	-	-	-	-	-	-
Netherlands	390	866	340	726	1,949	2,761
Norway	27,966	24,464	27,311	30,835	50,600	108,250
Sweden	692	1,903	1,440	760	1,300	3,162
UK (Engl. & Wales)	16	16	2	143	18	94
UK (Scotland)	44	4	13	7	541	19,763
UK (N.Ireland)	-	-	-	-	-	-
USSR	-	-	-	-	-	-
Unallocated, discards and misreported	450	96	202	3,656	162,822	136,737
Total	35,483	40,985	39,576	50,466	243,700	301,618
Misreported ³					148,000	117,000

Country	1988	1989	1990	1991	1992	1993 ²	1994 ²
Belgium	20	37	-	125	102	191	351
Denmark	32,588	26,831	29,000	38,834	41,719	42,502	47,852
Estonia					400	-	-
Faroe Islands	-	2,685	5,900	5,338	-	11,408	11,027
France	1,806	2,200	1,600	2,362	956	1,480	1,570
Germany, Fed. Rep.	177	6,312	3,500	4,173	4,610	4,940	1,479
Ireland	-	8,880	12,800	13,000	13,136	13,206	9,032
Latvia					211	-	-
Netherlands	2,564	7,343	13,700	4,591	6,547	7,770	3,637
Norway	59,750	81,400	74,500	102,350	115,700	112,700	115,741
Sweden	1,003	6,601	6,400	4,227	5,100	5,934	7,099
UK (Engl. & Wales)	160	5,618	1,300	2,671	2,258	2,262	2,272
UK (Scotland)	616	33,042	28,100	33,991	32,879	38,747	25,207
UK (N.Ireland)	100	-	1,400	255	-	1	-
Russia	-	-	-	-	-	-	2,003
Romania	-	-	-	-	-	-	2,903
Unallocated, discards, and misreported	233,532	100,651	126,900	153,958	143,546	149,417	245,807
Total	338,316	281,600	305,100	365,875	367,164	390,558	475,980
Misreported ³	180,000	92,000	126,000	130,000	127,000	146,697	245,157

¹ May includes catches taken in Division IIa.

² Preliminary.

³ Catches reported as taken in Division VIa.

Table 3.12.3.3 Catch (t) of MACKEREL in the Western area (Sub-areas VI and VII and Divisions VIIa,b,d,e). (Data submitted by Working Group members).

Country	1982	1983	1984	1985	1986	1987
Belgium	-	+	+	-	+	-
Denmark	15,000	15,000	200	400	300	100
Faroe Islands	11,100	14,900	9,200	9,000	1,400	7,100
France	12,300	11,000	12,500	7,400	11,200	11,100
Germany, Fed. Rep.	11,200	23,000	11,200	11,800	7,700	13,300
Ireland	109,700	110,000	84,100	91,400	74,500	89,500
Netherlands	67,200	73,600	99,000	37,000	58,900	31,700
Norway	19,000	19,900	34,700	24,300	21,000	21,600
Poland	-	-	-	-	-	-
Spain	-	-	100	+	-	-
UK (Engl. & Wales)	82,900	62,000	30,000	9,600	9,100	25,200
UK (N.Ireland)	9,600	800	10,600	12,200	9,700	10,700
UK (Scotland)	147,400	120,100	157,700	184,100	137,500	164,800
USSR	-	+	200	+	-	-
Unallocated + misreported	97,300	105,500	18,000	75,100	-98,701	-91,000
Discard	24,900	11,300	12,100	4,500	-	-
Grand Total	607,700	567,100	479,600	467,700	232,599	284,000
Misreported ³					-148,000	-117,000

Country	1988	1989 ²	1990	1991	1992	1993 ²	1994 ²
Belgium	-	-	-	-	-	-	-
Denmark	-	1,000 ²	-	1,573	194	-	2,239
Faroe Islands	2,600	1,100	1,000	4,095	-	2,350	4,283
France	8,900	12,700	17,400	10,364	9,109	8,296	9,998
Germany, Fed. Rep.	15,900	16,200	18,100	17,138	21,952	23,776	25,011
Ireland	85,800	61,100	61,500	64,827	76,313	81,773	79,996
Netherlands	26,100	24,000	24,500	29,156	32,365	44,600	40,698
Norway	17,300	700	-	-	-	600	2,552
Poland	-	-	-	-	-	-	-
Spain	1,500	1,400	400	4,020	2,764	3,162	4,126
UK (Engl. & Wales)	24,100	14,700	19,200	25,500	29,978	40,111	47,736
UK (N.Ireland)	8,900	11,000	12,800	2,995	2,238	1,476	754
UK (Scotland)	175,400	123,400	130,700	134,093	164,674	173,678	160,166
USSR	+	-	-	-	-	-	-
Unallocated + misreported	-175,300	-73,100	-114,500	-133,802	-125,528 ¹	-146,697 ¹	-130,133
Discard	5,800	4,900	11,300	23,550	22,020	15,660	4,220
Grand Total	377,000	288,900	302,900	183,509	236,079	248,785	251,646
Misreported ³	-180,000	-92,000	-126,000	-130,000	-127,000	-146,697	134,765

¹Includes catches taken in Division IVa, but misreported to Division VIa.

²Preliminary.

³Catches taken in Division IVa but reported for Division VIa.

Table 3.12.3.4 Landings (tonnes) of Mackerel in Divisions VIIIc and IXa, 1977–1994. (Data submitted by Working Group members).

Years	Division VIIIc	Division IXa				Total	TOTAL
	Spain	Portugal	Spain	Poland	USSR		
1977	19,852	1,743	2,935	8	2,879	7,585	27,417
1978	18,543	1,555	6,221	-	189	7,965	26,508
1979	15,013	1,071	6,280	-	111	7,462	22,475
1980	11,318	1,929	2,719	-	-	4,648	15,964
1981	12,834	3,108	2,111	-	-	5,219	18,053
1982	15,621	3,018	2,437	-	-	5,455	21,076
1983	10,390	2,239	2,224	-	-	4,463	14,853
1984	13,852	2,250	4,206	-	-	6,456	20,308
1985	11,810	4,178	2,123	-	-	6,301	18,111
1986	16,533	6,419	1,837	-	-	8,256	24,789
1987	15,982	5,714	491	-	-	6,205	22,187
1988	16,844	4,388	3,540	-	-	7,928	24,772
1989	13,446	3,112	1,763	-	-	4,875	18,321
1990	16,086	3,819	1,406	-	-	5,225	21,311
1991	16,940	2,789	1,051	-	-	3,840	20,780
1992	12,043	3,578	2,427	-	-	6,003	18,046
1993	16,675	2,015	1,027	-	-	3,042	19,719
1994	21,146	2,158	1,741	-	-	3,899	25,045

Table 3.12.3.5 Catches of MACKEREL by area. Discards not estimated prior to 1978. (Data submitted by Working Group members.)

Year	Sub-area VI			Sub-area VII and Divisions VIIa, b, d, e			Sub-area IV and Division IIIa			Divs. IIa, Vb ¹		Divs. VIIIc, IXa		Total		
	Landings	Discards	Catch	Landings	Discards	Catch	Landings	Discards ²	Catch	Landings		Landings		Landings	Discards	Catch
1969	4,800	-	4,800	66,300	-	66,300	739,182	-	739,182	+				810,282	-	810,282
1970	3,900	-	3,900	100,300	-	100,300	322,451	-	322,451	163				426,814	-	426,814
1971	10,200	-	10,200	122,600	-	122,600	243,673	-	243,673	358				376,831	-	376,831
1972	10,000	-	10,000	157,800	-	157,800	188,599	-	188,599	88				356,487	-	356,487
1973	52,200	-	52,200	167,300	-	167,300	326,519	-	326,519	21,600		Not available		567,619	-	567,619
1974	64,100	-	64,100	234,100	-	234,100	298,391	-	298,391	6,800				603,391	-	603,391
1975	64,800	-	64,800	416,500	-	416,500	263,062	-	263,062	34,700				779,062	-	779,062
1976	67,800	-	67,800	439,400	-	439,400	303,842	-	303,842	10,500				821,542	-	821,542
1977	74,800	-	74,800	259,100	-	259,100	258,131	-	258,131	1,400				620,848	-	620,848
1978	151,700	15,100	166,900	355,500	35,500	391,000	148,817	-	148,817	4,200				686,725	50,700	737,425
1979	203,300	20,300	223,600	398,000	39,800	437,800	152,323	500	152,823	7,000				783,098	60,600	843,698
1980	218,700	6,000	224,700	386,100	15,600	401,700	87,391	-	87,391	8,300				716,455	21,600	738,055
1981	335,100	2,500	337,600	274,300	39,800	314,100	64,172	3,216	67,388	18,700				710,325	45,516	755,841
1982	340,400	4,100	344,500	257,800	20,800	278,600	35,033	450	35,483	37,600				691,009	25,350	716,359
1983	315,100	22,300	337,400	245,400	9,000	254,400	40,889	96	40,985	49,000				665,242	31,396	696,638
1984	306,100	1,600	307,700	176,100	10,500	186,600	39,374	202	39,576	93,900				635,782	12,302	648,084
1985	308,140	2,735	390,875	75,043	1,800	76,843	46,790	3,656	50,446	78,000				606,084	8,191	614,275
1986	104,100	+	104,100	128,499	+	128,499	236,309	7,431	243,740	101,000				594,697	7,431	602,128
1987	183,700	+	183,700	100,300	+	100,300	290,829	10,789	301,618	47,000				644,016	10,789	654,805
1988	115,600	3,100	118,700	75,600	2,700	78,300	308,550	29,766	338,316	116,200				640,772	35,566	676,288
1989	121,300	2,600	123,900	72,900	2,300	75,200	279,410	2,190	281,600	86,900				578,831	7,090	585,921
1990	114,800	5,800	120,600	56,300	5,500	61,800	300,800	4,300	305,100	116,800				610,011	15,600	625,611
1991	109,500	10,700	120,200	50,500	12,800	63,300	358,700	7,200	365,900	97,800				637,183	30,700	667,883
1992	141,906	9,620	151,526	72,153	12,400	84,553	364,184	2,980	367,164	139,062				735,351	25,000	760,351
1993	133,497	2,670	136,167	99,828	12,790	112,618	387,838	2,720	390,558	165,973				806,856	18,180	825,036
1994	134,338	1,390	135,728	113,088	2,830	115,918	474,830	1,150	475,980	69,900				817,198	5,370	822,568

¹For 1976-1985 only Division IIa.²Discards estimated only for one fleet.

NB: Landings from 1969-1978 were taken from the 1978 Working Group report (Tables 2.1, 2.2 and 2.5).

Table 3.12.3.6 Catches of mackerel by Division and Sub-area in 1994.
(Data submitted by Working Group members).

Division/ Sub-area	Quarter				Total
	1	2	3	4	
Ila + Vb	500	1,600	66,600	1,200	69,900
IVa	89,000	1,500	140,000	233,800	464,300
IVb	+	+	700	100	800
IVc	100	600	1,300	1,000	3,000
IIIa	100	400	6,500	900	7,900
VI	112,300	4,400	6,200	12,800	135,700
VII	54,500	22,700	4,700	28,000	109,900
VIIIa,b,d,e	2,900	2,400	400	300	6,000
Sub-total	259,400	33,600	226,400	278,100	797,500
VIIIc	7,700	12,500	600	300	21,100
IXa	600	1,000	1,100	1,300	4,000
Grand total	267,700	47,100	228,100	279,700	822,600

Catches rounded to nearest 100.

Catches less than 50 t = +.

Table 3.12.3.7 Mackerel (combined Southern, Western and Northern components).

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 4-8
1984	7,977.00	2,793.33	648.08	0.204
1985	3,450.00	2,882.78	614.28	0.169
1986	3,432.00	2,611.44	602.13	0.161
1987	5,882.00	2,985.48	654.81	0.183
1988	3,666.00	3,113.38	676.29	0.195
1989	4,903.00	3,144.90	585.92	0.154
1990	2,699.00	2,983.48	625.61	0.159
1991	2,793.00	3,324.75	667.88	0.175
1992	3,077.00	3,235.04	760.35	0.213
1993	3,394.00	2,785.54	825.04	0.283
1994	2,083.00	2,357.19	822.60	0.292
Average	3,941.45	2,928.85	680.27	0.199
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.12.3.8 Mackerel (Western component).

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 4-8
1975	4,922.00	3,051.22	491.38	0.230
1976	5,093.00	2,699.61	507.18	0.241
1977	936.00	2,687.19	325.97	0.119
1978	3,421.00	2,870.62	503.91	0.160
1979	5,651.00	2,535.10	605.74	0.225
1980	5,624.00	2,157.23	604.76	0.251
1981	7,175.00	2,262.43	661.76	0.202
1982	1,896.00	2,159.99	623.82	0.202
1983	1,293.00	2,425.11	614.29	0.196
1984	7,668.00	2,483.67	550.93	0.189
1985	2,884.00	2,610.34	561.29	0.160
1986	3,301.00	2,276.86	537.62	0.160
1987	5,797.00	2,686.53	615.38	0.191
1988	3,232.00	2,821.35	628.00	0.200
1989	4,480.00	2,866.25	567.40	0.156
1990	2,452.00	2,684.35	605.94	0.163
1991	2,651.00	3,027.64	646.17	0.183
1992	2,600.00	2,926.96	742.31	0.225
1993	3,909.00	2,474.11	805.04	0.313
1994	1,375.00	2,034.62	793.26	0.319
Average	3,818.00	2,587.06	599.61	0.204
Unit	Millions	1000 tonnes	1000 tonnes	-

Table 3.12.3.9

North Sea Mackerel Weight in '000 t.

Year	Spawning Stock Biomass	Landings
1965	2850 \$	208
1966	2700 \$	530 *
1967	1900 \$	930 *
1968	1500 \$	822 *
1969	1113 "	739 *
1970	550 "	323 *
1971	580 "	243 *
1972	1249 "	125 +
1973	1097 "	226 +
1974	1036 "	190 +
1975	826 +	138 +
1976	700 +	165 +
1977	583 +	188 +
1978	436 +	103 +
1979	336 +	66 +
1980	258 +	61 +
1981	189 +	60 +
1982	162 +	40 +
1983	168 +	43 +
1984	133 #	67 +
1985		35 +
1986	45 #	25 +
1987		3 +
1988	37 #	6
1989		7
1990	78 #	10
1991		- **
1992		- **
1993		- **
1994		- **
Average	805	206

\$ Hamre, J. 1980 Rapp.P.-v. Reun.Cons.int.Explor.Mer. 177:212-242

* Report of the Mackerel Working Group 1975, ICES CM1975/H:3.

" Report of the Mackerel Working Group 1981, ICES CM 1981/H:7

+ Report of the Mackerel Working Group 1989, ICES CM 1989/H:7

Estimations based on Mackerel Egg Surveys

** Assumed by the Working Group to be 10 000 t as in 1990.

Table 3.12.4.1 Landings (t) of HORSE MACKEREL by Sub-area. Data as submitted by Working Group members).

Sub-area	1979	1980	1981	1982	1983	1984
II	2	-	+	-	412	23
IV + IIIa	1,412	2,151	7,245	2,788	4,420	25,987
VI	7,791	8,724	11,134	6,283	24,881	31,716
VII	43,525	45,697	34,749	33,478	40,526	42,952
VIII	47,155	37,495	40,073	22,683	28,223	25,629
IX	37,619	36,903	35,873	39,726	48,733	23,178
Total	137,504	130,970	129,074	104,958	147,195	149,485

Sub-area	1985	1986	1987	1988	1989	1990
II	79	214	3,311	6,818	4,809	11,414
IV + IIIa	24,238	20,746	20,895	62,892	112,047	145,062
VI	33,025	20,455	35,157	45,842	34,870	20,904
VII	39,034	77,628	100,734	90,253	138,890	192,196
VIII	27,740	43,405	37,703	34,177	38,686	46,302
IX	20,237	31,159	24,540	29,763	29,231	24,023
Total	144,353	193,607	222,340	269,745	358,533	439,901

Sub-area	1991	1992	1993	1994 ¹
II + Vb	4,487	13,457	3,168	759
IV + IIIa	77,994	113,141	140,383	112,580
VI	34,455	40,921	53,822	69,616
VII	201,326	188,135	221,120	200,256
VIII	49,426	54,186	53,753	35,500
IX	21,778	26,713	31,944	28,442
Total	389,466	436,553	504,190	447,153

¹Preliminary.

Table 3.12.4.2 Landings (t) of HORSE MACKEREL in Sub-area II. (Data as submitted by Working Group members.)

Country	1980	1981	1982	1983	1984
Denmark	-	-	-	-	-
France	-	-	-	-	1
Germany, Fed.Rep.	-	+	-	-	-
Norway	-	-	-	412	22
USSR	-	-	-	-	-
Total	-	+	-	412	23

Country	1985	1986	1987	1988	1989	1990
Faroe Islands	-	-	-	-	-	964 ³
Denmark	-	-	39	-	-	-
France	1	²	²	²	-	-
Germany, Fed.Rep.	-	-	-	64	12	+
Norway	78	214	3,272	6,285	4,770	9,135
USSR	-	-	-	469	27	1,298
UK (England + Wales)	-	-	-	-	-	17
Total	79	214	3,311	6,818	4,809	11,414

Country	1991	1992	1993	1994 ¹
Faroe Islands	1,115 ³	9,157 ³	1,068	-
Denmark	-	-	-	-
France	-	-	-	55
Germany	-	-	-	-
Norway	3,200	4,300	2,100	4
Russia	172	-	-	700
UK (England + Wales)	-	-	-	-
Total	4,487	13,457	3,168	759

¹Preliminary.

²Included in Sub-area IV.

³Includes catches in Division Vb.

Table 3.12.4.3 Landings (t) of HORSE MACKEREL in Sub-area VI by country. (Data submitted by Working Group members.)

Country	1980	1981	1982	1983	1984	1985
Denmark	734	341	2,785	7	-	-
Faroe Islands	-	-	1,248	-	-	4,014
France	45	454	4	10	14	13
Germany, Fed. Rep.	5,550	10,212	2,113	4,146	130	191
Ireland	-	-	-	15,086	13,858	27,102
Netherlands	2,385	100	50	94	17,500	18,450
Norway	-	5	-	-	-	-
Spain	-	-	-	-	-	-
UK (Engl. + Wales)	9	5	+	38	+	996
UK (N. Ireland)	-	-	-	-	-	-
UK (Scotland)	1	17	83	-	214	1,427
USSR	-	-	-	-	-	-
Unallocated + discards						-19,168
Total	8,724	11,134	6,283	24,881	31,716	33,025

Country	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Denmark	-	769	1,655	973	615	-	42	-	294
Faroe Islands	1,992	4,450 ³	4,000 ³	3,059	628	255	-	820	80
France	12	20	10	2	17	4	3	+	-
Germany, Fed. Rep.	354	174	615	1,162	2,474	2,500	6,281	10,023	1,430
Ireland	28,125	29,743	27,872	19,493	15,911	24,766	32,994	44,802	65,564
Netherlands	3,450	5,750	3,340	1,907	660	3,369	2,150	590	341
Norway	83	75	41	-	-	-	-	-	-
Spain	²	²	²	²	²	1	3	-	-
UK (Engl. + Wales)	198	404	475	44	145	1,229	577	144	109
UK (N. Ireland)	-	-	-	-	-	1,970	723	-	-
UK (Scotland)	138	1,027	7,834	1,737	267	1,640	86	4,523	1,760
USSR	-	-	-	-	44	-	-	-	-
Unallocated + discards	-13,897	-7,255	-	6,493	143	-1,278	-1,940	-6,960 ⁴	-51
Total	20,455	35,157	45,842	34,870	20,904	34,455	40,919	53,942	69,616

¹Preliminary.

²Included in Sub-area VII.

³Includes Divisions IIIa, IVa,b and VIb.

⁴Includes a negative unallocated catch of -7,000 t.

Table 3.12.4.4 Landings (t) of HORSE MACKEREL in Sub-area VII by country. Data submitted by the Working Group members.)

Country	1980	1981	1982	1983	1984	1985
Belgium	-	1	1	-	-	-
Denmark	5,045	3,099	877	993	732	+
France	1,983	2,800	2,314	1,834	2,387	1,477 ²
Germany, Fed. Rep.	2,289	1,079	12	1,977	228	1,881
Ireland	-	16	-	-	65	-
Netherlands	23,002	25,000	27,500 ²	34,350	38,700	100
Norway	394	-	-	-	-	33,550
Spain	50	234	104	142	560	-
UK (Engl. + Wales)	12,933	2,520	2,670	1,230	279	275
UK (Scotland)	1	-	-	-	1	1,630
USSR	-	-	-	-	-	-
						1
						120
						-
Total	45,697	34,749	33,478	40,526	42,952	39,034

Country	1986	1987	1988	1989	1990	1991	1992	1993	1994 ¹
Faroe Islands	-	-	-	-	28	-	-	-	-
Belgium	+	2	-	-	+	-	-	-	1
Denmark	30,408 ²	27,368	33,202	34,474	30,594	28,888	18,984	16,978	41,605
France	3,801	2,197	1,523	4,576	2,538	1,230	1,198	1,001	-
Germany, Fed. Rep.	5	374	4,705	7,743	8,109	12,919	12,951	15,684	14,828
Ireland	703	15	481	12,645	17,887	19,074	15,568	16,363	15,281
Netherlands	40,750	69,400	43,560	43,582	111,900	104,107	109,197	157,110	92,903
Norway	-	-	-	-	-	-	-	-	-
Spain	137	148	150	14	16	113	106	54	29
UK (Engl. + Wales)	1,824	1,228	3,759	4,488	13,371	6,436	7,870	6,090	12,418
UK (N. Ireland)	-	-	-	-	-	2,026	1,690	587	119
UK (Scotland)	+	2	2,873	+	139	1,992	5,008	3,123	9,015
USSR	-	-	-	-	-	-	-	-	-
Unallocated + discards	-	-	-	28,368	7,614	24,541	15,563	4,010 ³	14,057
Total	77,628	100,734	90,253	138,890	192,196	201,326	188,135	221,000	200,256

¹Provisional.

²Includes Sub-area VI.

³Includes a negative unallocated catch of -4,000 t.

Table 3.12.4.5 Landings and discards of HORSE MACKEREL (t) by year and division, for the North Sea, Western and Southern horse mackerel (Data submitted by Working Group members.)

Year	North Sea horse mackerel					Western horse mackerel							Southern horse mackerel			Total
	IIIa	IVb,c	Discards	VIIId	Total	IIa	IVa	VIa	VIIa-c,e-k	VIIIa,b,d,e	Discards	Total	VIIIc	IXa	Total	
1982	-	2,788 ³	-	1,247	4,035	-	-	6,283	32,231	3,073	-	41,587	19,610	39,726	59,336	104,958
1983	-	4,420 ³	-	3,600	8,020	412	-	24,881	36,926	2,643	-	64,862	25,580	48,733	74,313	147,195
1984	-	25,893 ³	-	3,585	29,478	23	94	31,716	38,782	2,510	500	73,625	23,119	23,178	46,297	149,400
1985	1,138	22,897	-	2,715	26,750	79	203	33,025	35,296	4,448	7,500	80,551	23,292	20,237	43,529	150,830
1986	396	19,496	-	4,756	24,648	214	776	20,343	72,761	3,071	8,500	105,665	40,334	31,159	71,493	201,806
1987	436	9,477	-	1,721	11,634	3,311	11,185	35,197	99,942	7,605	-	157,240	30,098	24,540	54,638	223,512
1988	2,261	18,290	-	3,120	23,671	6,818	42,174	45,842	81,978	7,548	3,740	188,100	26,629	29,763	56,392	268,163
1989	913	25,830	-	6,522	33,265	4,809	85,304 ²	34,870	131,218	11,516	1,150	268,867	27,170	29,231	56,401	358,533
1990	14,872 ¹	17,437	-	1,325	18,762	11,414	112,753 ²	20,794	182,580	21,120	9,930	373,463	25,182	24,023	49,205	441,430
1991	2,725 ¹	11,400	-	600	12,000	4,487	63,869 ²	34,415	196,926	25,693	5,440	333,555	23,733	21,778	45,511	391,066
1992	2,374 ¹	13,955	400	688	15,043	13,457	101,752	40,881	180,937	29,329	1,820	370,550	24,243	26,713	50,955	436,548
1993	850 ¹	3,895	930	8,792	13,617	3,168	134,908	53,782	204,318	27,519	8,600	433,145	25,483	31,945	57,428	504,190
1994	2,492 ¹	2,496	630	2,503	5,689	759	106,911	69,546	194,188	11,044	3,935	388,875	24,147	28,442	52,589	447,153

¹Norwegian and Danish catches are included in the Western horse mackerel.

²Norwegian catches in Division IVb included in the Western horse mackerel.

³Divisions IIIa and IVb,c combined.

Table 3.12.5.1 Landings (tonnes) of BLUE WHITING from the main fisheries, 1985-1994, as estimated by the Working Group.

Area	1985	1986	1987	1988	1989
Norwegian Sea fishery (Sub-areas I + II and Divisions Va, XIVa + XIVb)	90,742	160,061	123,042	55,829	37,638
Fishery in the spawning area (Divisions Vb, VIa, VIb and VIIb + VIIc)	464,265 ²	534,263 ²	445,884 ²	421,636	473,165
Icelandic industrial fishery (Division Va)	-	-	-	-	4,977
Industrial mixed fishery (Divisions IVa-c, Vb, IIIa)	97,769	99,580	62,689	45,110	75,958
Sub-total northern fishery	652,776	793,904	631,615	522,575	591,738
Southern fishery (Sub-areas VIII + IX, Divisions VIId,e + VIIg-k)	42,820 ³	33,082 ³	32,819 ³	30,838	33,695
Total	695,596	826,986	664,434	553,413	625,433

Area	1990	1991	1992	1993	1994
Norwegian Sea fishery (Sub-areas I + II and Divisions Va, XIVa + XIVb)	2,106	78,703	62,312	43,240	22,252
Fishery in the spawning area (Divisions Vb, VIa, VIb and VIIb + VIIc)	463,495	218,946	317,237	345,770	378,704
Icelandic industrial fishery (Division Va)	-	-	-	-	-
Industrial mixed fishery (Divisions IVa-c, Vb, IIIa)	63,192	39,872	66,174	55,215	24,888
Sub-total northern fishery	528,793	337,521	445,723	444,225	425,844
Southern fishery (Sub-areas VIII + IX, Divisions VIId,e + VIIg-k)	32,817	32,003	28,722	32,256	29,473
Total	561,610	369,524	474,445	476,481	455,317

¹Preliminary.

²Including directed fishery also in Divisions VIIg-k, IVa and Sub-area XII.

³Excluding directed fishery also in Divisions VIIg-k.

Table 3.12.5.2 Landings (tonnes) of BLUE WHITING from the directed fishery in the Norwegian Sea (Sub-areas I and II, Divisions Va, XIVa and XIVb) fisheries, 1985-1994, as estimated by the Working Group.

Country	1985	1986	1987	1988	1989
Faroese	-	-	9,290	-	1,047
France	-	-	-	-	-
German Dem. Rep.	1,689	3,541	1,010	3	1,341
Germany, Fed. Rep.	75	106	-	-	-
Greenland	-	10	-	-	-
Iceland	-	-	-	-	-
Norway	-	-	-	-	-
Poland	-	-	56	10	-
UK (Engl. & Wales)	-	-	-	-	-
USSR	88,978	156,404	112,686	55,816	35,250
Total	90,742	160,061	123,042	55,829	37,638

Country	1990	1991	1992	1993 ¹	1994
Faroese	-	-	-	-	-
France	-	-	-	-	-
Germany	-	-	-	-	2
Greenland	-	-	-	-	-
Iceland	-	-	-	-	-
Norway	566	100	912	240	-
Poland	-	-	-	-	22,250 ³
UK (Engl. & Wales)	-	-	-	-	-
USSR/Russia ²	1,540	78,603	61,400	43,000	-
Total	2,106	78,703	62,312	43,240	22,252

¹Preliminary.

²In 1991.

³Includes Division Vb

Table 3.12.5.3

Landings (tonnes) of BLUE WHITING from directed fisheries in the spawning area (Divisions Vb, VIa,b, VIIb,c and since 1984 Divisions VIIg-k and Sub-area XII), 1985-1994, as estimated by the Working Group.

Country	1985	1986	1987	1988	1989
Denmark	21,104	11,364	2,655	797	25
Faroes	72,316	80,564	70,625	79,339	70,711
France	-	-	-	-	2,190
German Dem.Rep.	6,839	2,750	3,584	4,663	3,225
Germany, Fed.Rep.	626	-	266	600	848
Ireland	668	16,440	3,300	245	-
Netherlands	1,801	8,888	5,627	800	2,078
Norway	234,137	283,162 ²	191,012	208,416	258,386
UK (Engl. & Wales)	2	10	5	3	1,557
UK (Scotland)	-	3,472	3,310	5,068	6,463
USSR	126,772	127,613	165,497	121,705	127,682
					-
					-
					-
Total	464,265	534,263	445,884	421,636	473,165

Country	1990	1991	1992	1993 ¹	1994
Denmark	-	-	3,167	-	770
Faroes	43,405	10,208 ²	12,731 ²	14,984	22,548
France	-	-	-	1,195	-
German Dem.Rep.	230	-	-	-	-
Germany, Fed.Rep.	1,469	349	1,307 ⁴	91 ⁴	-
Ireland	-	-	-	-	3
Netherlands	7,280	17,359	11,034	18,436	21,076
Norway	281,036 ²	114,866 ²	148,733 ²	198,916	226,235
UK (Engl. & Wales)	13	-	356	2	1,418
UK (Scotland)	5,993	3,541	6,493	2,030	3,047
USSR/Russia ³	124,069	72,623	115,600	96,000	94,531
Japan	-	-	918	1,742	2,574
Estonia	-	-	6,156	10,328	4,342
Latvia	-	-	10,742	2,046	2,160
Total	463,495	218,946	317,237	345,770	378,704

¹Preliminary.

²Including directed fishery also in Division IVa.

³In 1991.

⁴Germany

Table 3.12.5.4 Landings (tonnes) of BLUE WHITING from the mixed industrial fisheries and caught as by-catch in ordinary fisheries in Divisions IIIa, IVa-c, Vb and IIa, 1985-1994, as estimated by the Working Group.

Country	1985	1986	1987	1988	1989
Denmark	35,843	57,315	28,541	18,114	26,605
Faroes	3,606	5,678	7,051	492	3,325
France	-	-	-	-	-
German Dem.Rep. ²	-	-	53	-	-
Germany, Fed.Rep. ²	52	-	62	280	3
Netherlands	130	1,114	-	-	-
Norway	54,522	26,941	24,969	24,898	42,956
Sweden	3,616	8,532	2,013	1,226	3,062
UK (Engl. & Wales) ²	-	-	-	-	7
UK (Scotland)	-	-	-	100	-
Total	97,769	99,580	62,689	45,110	75,958

Country	1990	1991	1992	1993 ¹	1994
Denmark	27,052	15,538	31,389	41,053	19,686
Faroes	5,281	355	705	1,522	1,794
France	-	-	-	-	-
German Dem.Rep. ²	-	-	-	-	-
Germany, Fed.Rep. ²	-	-	25	9	-
Netherlands	20	-	2	46	-
Norway	29,336 ³	22,644	31,977	12,333 ⁵⁾	3,408 ⁵⁾
Sweden	1,503	1,000	2,058	-	-
UK (Engl. & Wales) ²	-	-	17	-	-
UK (Scotland)	-	335	1	2,52	-
Total	63,192	39,872	66,174	55,215	24,888

¹Preliminary.

²Including directed fishery also in Division IVa.

³Including mixed industrial fishery in the Norwegian Sea.

⁴Germany

⁵⁾Unprecise estimates. Reported catch of 37,365 t in 1993 and 28,653 in 1994 not used in the VPA-run.

Table 3.12.5.5 Landings (tonnes) of BLUE WHITING from the Southern areas (Sub-areas VIII and IX and Divisions VIIg-k and VIId,e; from 1984, the Divisions VIIg-k are not included) 1985-1994 as estimated by the Working Group.

Country	1985	1986	1987	1988	1989
France	-	-	-	-	1
Netherlands	-	-	-	-	-
Norway	-	-	4	-	-
Portugal	6,989	8,116	9,148	5,979	3,557
Spain	35,828	24,965	23,644	24,847	30,108
UK (England & Wales)	3	1	23	12	29
Total	42,820	33,082	32,819	30,838	33,695

Country	1990	1991	1992	1993	1994
France	-	-	-	-	-
Netherlands	450	10	-	-	-
Norway	-	-	-	-	-
Portugal	2,864	2,813	4,928	1,236	1,350
Spain	29,490	29,180	23,794	31,020	28,118
UK (England & Wales)	13	-	-	-	5
Total	32,817	32,003	28,722	32,256	29,473

¹Preliminary.

Table 3.12.5.6 Blue whiting combined stock (Suib-areas I-IX, XII and XIV).

Year	Landings
1973	103,000
1974	108,000
1975	112,000
1976	164,000
1977	269,000
1978	609,000
1979	1,119,000
1980	1,123,000
1981	909,556
1982	576,419
1983	570,072
1984	641,776
1985	695,596
1986	826,986
1987	664,434
1988	553,413
1989	625,433
1990	561,610
1991	369,524
1992	474,445
1993	476,481
1994	455,317
Average	545,821
Unit	tonnes

Table 3.13.2.1 Nominal fish catches in the Baltic from 1973-1994 (in '000 t). Anadromous species, except salmon, not included. (Data as officially reported to ICES.)

Year	Species							Total
	Cod	Herring	Sprat	Flatfish	Salmon	Freshwater species	Others	
1973	189	404	213	18	2.7	23	55	905
1974	189	407	242	21	2.9	21	54	937
1975	234	415	201	24	2.9	20	60	957
1976	255	393	195	19	3.1	21	46	932
1977	213	413	211	22	2.4	22	42	925
1978	196	420	132	23	2.0	22	44	839
1979	273	459	78	24	2.3	20	47	903
1980	388	453	57	18	2.4	14	29	961
1981	380	419	47	16	2.4	13	31	908
1982	361	442	45	17	2.2	13	30	910
1983	376	459	31	16	2.4	13	20	917
1984	442	426	52	15	3.7	13	17	969
1985	344	431	69	17	4.0	11	16	892
1986	271	401	75	18	3.5	12	19	800
1987	238	373	91	16	3.8	13	24	759
1988	225	407	86	14	3.2	13	31	779
1989	192	414	89	14	4.2	14	18	745
1990	167	360	92	12	5.6	11	18	666
1991 ¹	139	295	111	14	4.6	17	19	600
1992 ¹	72	339	146	12	4.7	8	13	595
1993 ¹	41	352	194	12	3.4	10	7	619
1994 ¹	75	353	301	18	2.9	9	8	767

¹Preliminary.

Table 3.13.2.2 Nominal catch (tonnes) of HERRING in Divisions IIIb,c,d, 1963-1994. (Data as officially reported to ICES.)

Year	Denmark	Finland	German Dem. Rep.	Germany, Fed. Rep.	Poland	Sweden	USSR	Total
1963	14,991	48,632	10,900	16,588	28,370	27,691	78,580 ¹	225,752
1964	29,329	34,904	7,600	16,355	19,160	31,297	84,956	223,601
1965	20,058	44,916	11,300	14,971	20,724	31,082 ²	83,265	226,216
1966	22,950	41,141	18,600	18,252	27,743	30,511	92,112	251,309
1967	23,550	42,931	42,900	23,546	32,143	36,900	108,154	310,124
1968	21,516	58,700	39,300	16,367	41,186	53,256	124,627	354,952
1969	18,508	56,252	19,100	15,116	37,085	30,167	118,974	295,202
1970	16,682	51,205	38,000	18,392	46,018	31,757	110,040	312,094
1971	23,087	57,188	41,800	16,509	43,022	32,351	120,728	334,685
1972	16,081	53,758	58,100	10,793	45,343	41,721	118,860	344,656
1973	24,834	67,071	65,605	8,779	51,213	59,546	127,124	404,172
1974	19,509	73,066	70,855	9,446	55,957	60,352	117,896	407,081
1975	18,295	69,581	71,726	10,147	68,533	62,791	113,684	414,757
1976	23,087	75,581	58,077	6,573	63,850	41,841	124,479	393,488
1977	25,467	78,051	62,450	7,660	60,212	52,871	126,000	412,711
1978	26,620	89,792	46,261	7,808	63,850	54,629	130,642	419,602
1979	33,761	83,130	50,241	7,786	79,168	86,078	118,655	458,819
1980	29,350	74,852	59,187	9,873	68,614	92,923	118,074	452,873
1981	28,424	65,389	56,643	9,124	64,005	84,500	110,782	418,867
1982	40,289	73,501	50,868	8,928	76,329	92,675	99,175	441,765
1983	32,657	83,679	51,991	9,273	82,329	86,561	112,370	458,860
1984	32,272	86,545	50,073	8,166	78,326	65,519	105,577	426,478
1985	27,847	88,702	51,607	9,079	85,865	57,554	110,783	431,437
1986	21,598	83,800	53,061	9,382	77,109	39,909	115,665	400,524
1987	23,283	82,522 ³	50,037	6,199	60,616	36,446	113,844	372,947
1988	29,950	92,824 ³	53,539	5,699	60,624	41,828	122,849	407,313
1989	26,654	81,122 ³	54,828	5,777	58,328	65,032	121,784	413,525
1990	16,237	66,078 ³	40,187	5,152	60,919	55,174	116,478	360,225

Year	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Sweden	Russia	Total
1991	23,995	27,034 ⁴	51,546 ³	16,022	33,270	6,468 ⁵	45,991	59,176	31,755	295,257 ⁶
1992	33,855	29,556	72,171 ³	17,746	25,965	3,237 ⁶	52,864	75,907	27,979	339,280 ⁶
1993	34,945	32,982	77,353 ³	20,143	21,949	3,912 ⁶	50,833	86,497	23,545	352,159 ⁶
1994	45,190	34,493	97,674 ³	12,367	22,676	4,988 ⁶	49,111	70,886	15,904	353,411 ^{6,7}

¹Including Division IIIa.

²Large quantity of herring used for industrial purposes is included with "Unsorted and Unidentified Fish".

³Includes some by-catch of sprat.

⁴As reported by Estonian authorities; 32,683 t reported by Russian authorities.

⁵As reported by Lithuanian authorities; 6,456 t reported by Russian authorities.

⁶Preliminary.

⁷Includes preliminary catches from the Faroe Islands of 122 t.

Table 3.12.2.3 Nominal catch (tonnes) of SPRAT in Divisions IIIb,c,d, 1963-1994. (Data as officially reported to ICES.)

Year	Denmark	Finland	German Dem.Rep.	Germany, Fed.Rep.	Poland	Sweden	USSR	Total
1963	2,525	1,399	8,000	507	10,693	101	45,820 ¹	69,045
1964	3,890	2,111	14,700	1,575	17,431	58	55,753	95,518
1965	1,805	1,637	11,200	518	16,863	46	52,829	84,898
1966	1,816	2,048	21,200	66	13,579	38	52,407	91,454
1967	3,614	1,896	11,100	2,930	12,410	55	40,582	72,587
1968	3,108	1,291	10,200	1,054	14,741	112	55,050	85,556
1969	1,917	1,118	7,500	377	17,308	134	90,525	118,879
1970	2,948	1,265	8,000	161	20,171	31	120,478	153,054
1971	1,833	994	16,100	113	31,855	69	133,850	184,814
1972	1,602	972	14,000	297	38,861	102	151,460	207,294
1973	4,128	1,854	13,001	1,150	49,835	6,310	136,510	212,788
1974	10,246	1,035	12,506	864	61,969	5,497	149,535	241,652
1975	9,076	2,854	11,840	580	62,445	31	114,608	201,434
1976	13,046	3,778	7,493	449	56,079	713	113,217	194,775
1977	16,933	3,213	17,241	713	50,502	433	121,700	210,735
1978	10,797	2,373	13,710	570	28,574	807	75,529	132,360
1979	8,897	3,125	4,019	489	13,868	2,240	45,727	78,365
1980	4,714	2,137	51	706	16,033	2,388	31,359	57,488
1981	8,415	1,895	78	505	11,205	1,510	23,881	47,489
1982	6,663	1,468	1,086	581	14,188	1,890	18,866	44,742
1983	2,861	828	2,693	550	8,492	1,747	13,725	30,896
1984	3,450	374	2,762	642	10,954	7,807	25,891	51,880
1985	2,417	364	1,950	638	22,156	7,111	34,003	68,639
1986	5,693	705	2,514	392	26,967	2,573	36,484	75,328
1987	8,617	287 ²	1,308	392	34,887	870	44,888	91,249
1988	6,869	495 ²	1,234	254	25,359	7,307	44,181	85,699
1989	9,235	222 ²	1,166	576	20,597	3,453	53,995	89,244
1990	8,858	162 ²	518	905	14,299	7,485	59,737	91,964

Year	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Sweden	Russia	Total
1991	21,781	14,124 ³	99 ²	736	17,996 ⁴	3,569	23,200	8,328	20,736	110,569 ⁵
1992	28,210	4,140	893 ²	608	17,388	1,697 ⁵	30,126	53,558	9,851	146,471 ⁵
1993	27,435	5,763	206 ²	8,267	12,553	2,798 ⁵	33,701	92,416	10,745	193,884 ⁵
1994	69,644	9,079	497 ²	374	20,132	2,789 ⁵	44,556	135,779	16,719	300,535 ^{5,6}

¹Including Division IIIa.²Some by-catch of sprat included in herring.³As reported by Estonian authorities; 17,893 t reported by Russian authorities.⁴As reported by Latvian authorities; 17,672 t reported by Russian authorities.⁵Preliminary.⁶Includes preliminary catches from the Faroe Islands of 966 t.

Table 3.13.2.4 Nominal catch (tonnes) of COD in Divisions IIIb,c,d, 1963-1994. (Data as officially reported to ICES.)

Year	Denmark	Faroe Islands	Finland	German Dem.Rep.	Germany Fed.Rep.	Poland	Sweden	USSR	Total
1963	35,851		12	7,800	10,077	47,514	22,827	30,550 ¹	154,631
1964	34,539		16	5,100	13,105	39,735	16,222	24,494	133,211
1965	35,990		23	5,300	12,682	41,498	15,736	22,420	133,649
1966	37,693		26	6,000	10,534	56,007	16,182	38,269	164,711
1967	39,844		27	12,800	11,173	56,003	17,784	42,975	180,606
1968	45,024		70	18,700	13,573	63,245	18,508	43,611	202,731
1969	45,164		58	21,500	14,849	60,749	16,656	41,582	200,558
1970	43,443		70	17,000	17,621	68,440	13,664	32,248	192,486
1971	47,563		3	9,800	14,333	54,151	12,945	20,906	159,701
1972	60,331		8	11,500	13,814	56,746	13,762	30,140	186,301
1973	66,846		95	11,268	25,081	49,790	16,134	20,083	189,297
1974	58,659		160	9,013	20,101	48,650	14,184	38,131	188,898
1975	63,860		298	14,740	21,483	69,318	15,168	49,289	234,156
1976	77,570		278	8,548	24,096	70,466	22,802	51,516	255,276
1977	74,495		310	10,967	31,560	47,703	18,327	29,680	213,042
1978	50,907		1,446	9,345	16,918	64,113	15,996	37,200	195,925
1979	60,071		2,938	8,997	18,083	79,697	24,003	78,730	272,519
1980	76,015	1,250	2,317	7,406	16,363	123,486	34,089	124,359	388,186 ²
1981	93,155	2,765	3,249	12,938	15,082	120,942	44,300	87,746	380,177
1982	98,230	4,300	3,904	11,368	19,247	92,541	44,807	86,906	361,303
1983	108,862	6,065	4,677	10,521	22,051	76,474	54,876	92,248	375,774
1984	121,297	6,354	5,257	9,886	39,632	93,429	65,788	100,761	442,404
1985	107,614	5,890	3,793	6,593	24,199	63,260	54,723	78,127	344,199
1986	98,081	4,596	2,917	3,179	18,243	43,237	48,804	52,148	271,205
1987	85,544	5,567	2,309	5,114	17,127	32,667	50,186	39,203	237,717
1988	75,019	6,915	2,903	4,634	16,388	33,351	58,027	28,137	225,374
1989	66,235	4,499	1,913	2,147	14,637	31,855	55,919	14,722	191,927
1990	56,702	3,558	1,667	1,630	7,225	28,730	54,473	13,461	167,446

Year	Denmark	Estonia	Faroe Islands	Finland	Germany	Latvia	Lithuania	Poland	Sweden	Russia	Total
1991	50,640	1,805 ³	2,992	1,662	8,637	2,627	1,849	25,748	39,552	3,196	138,708 ⁴
1992	30,418	1,369	593	460	6,668	1,250	874 ⁴	13,314	16,244	404	71,594 ⁴
1993	10,919	70	558	203	5,127	1,333	904 ⁴	8,909	12,201	483	40,707 ⁴
1994	19,822	905	779	520	7,088	2,379	1,886 ⁴	14,426	25,685	1,114	74,604 ⁴

¹Including Division IIIa.

²Includes catches from United Kingdom (England & Wales) of 2,901 t.

³As reported by Estonian authorities; 1,812 t reported by Russian authorities.

⁴Preliminary.

Table 3.13.2.5 Nominal catch (tonnes) of FLATFISH in Divisions IIIb,c,d, 1963-1994. (Data as officially reported to ICES.)

Year	Denmark	Finland	German Dem.Rep.	Germany, Fed.Rep.	Poland	Sweden	USSR	Total
1963	9,888	-	3,390	794	2,794	1,026	1,460 ¹	19,862
1964	9,592	-	4,600	905	1,582	1,147	4,420	22,246
1965	8,877	-	2,300	899	2,418	1,140	5,471	21,105
1966	7,590	-	2,900	647	3,817	1,113	5,328	21,395
1967	8,773	-	3,400	786	2,675	1,077	4,259	20,970
1968	9,047	-	3,600	769	4,048	1,047	4,653	23,164
1969	8,693	-	2,800	681	3,545	953	4,167	20,839
1970	7,937	-	2,200	606	3,962	464	3,731	18,900
1971	7,212	-	2,500	553	4,093	415	4,088	18,861
1972	6,817	-	3,200	542	4,940	412	3,950	19,861
1973	6,181	-	3,419	655	4,278	724	2,550	17,807
1974	9,686	55 ²	2,390	628	4,668	653	2,515	20,595
1975	8,257	100	2,172	937	5,139	658	6,455	23,718
1976	7,572	194	2,801	836	4,394	582	3,018	19,397
1977	7,239	203	3,378	960	4,879	484	4,754	21,897
1978	9,184	390	4,034	1,106	5,418	396	2,500	23,028
1979	10,376	399	4,396	665	5,137	450	2,670	24,093
1980	8,276	52	3,286	460	3,429	427	2,305	18,235
1981	6,674	78	3,031	704	2,958	434	2,323	16,202
1982	5,818	50	3,608	543	4,214	250	2,596	17,079
1983	6,000	39	3,957	751	2,809	217	2,371	16,144
1984	5,165	43	3,173	662	3,865	176	1,859	14,943
1985	6,506	37	4,290	542	3,533	170	1,528	16,606
1986	6,808	52	3,480	494	5,044	250	1,438	17,566
1987	5,734	58	2,457	757	4,468	273	2,194	15,941
1988	5,092	69	3,227	759	3,030	281	1,605	14,063
1989	4,597	70	3,822	644	2,946	245	1,723	14,047
1990	5,682	59	1,722	820	2,253	257	1,427	12,220

Year	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Sweden	Russia	Total
1991	5,583	248 ³	76	3,055	445 ⁴	n/a	4,009	224	317 ⁵	13,957 ⁶
1992	4,579	164	64	2,287	624	399 ⁶	3,906	337	75	12,435 ⁶
1993	3,275	165	85	2,156	475	155 ⁶	5,101	271	159	11,842 ⁶
1994	5,094	162	79	6,634	337	270 ⁶	4,900	314	173	17,963 ⁶

¹Including Division IIIa.

²Excluding subsistence fisheries.

³As reported by Estonian authorities; 236 t reported by Russian authorities.

⁴As reported by Latvian authorities; 466 t reported by Russian authorities.

⁵Includes 141 t reported by Russian authorities for Lithuania.

⁶Preliminary.

Table 3.13.3 a.1 HERRING in Division IIIa and Sub-divisions 22-24. 1985 - 1994. Landings in thousands of tonnes by country. (Data provided by Working Group members 1995).

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994*
Skagerrak										
Denmark	88.2	94.0	105.0	144.4	47.4	62.3	58.7	64.7	87.8	44.9
Faroe Islands	0.5	0.5								
Norway	4.5	1.6	1.2	5.7	1.6	5.6	8.1	13.9	24.2	17.7
Sweden	40.3	43.0	51.2	57.2	47.9	56.5	54.7	88.0	56.4	66.4
Total	133.5	139.1	157.4	207.3	96.9	124.4	121.5	166.6	168.4	129.0
Kattegat										
Denmark	69.2	37.4	46.6	76.2	57.1	32.2	29.7	33.5	28.7	23.6
Sweden	39.8	35.9	29.8	49.7	37.9	45.2	36.7	26.4	16.7	15.4
Total	109.0	73.3	76.4	125.9	95.0	77.4	66.4	59.9	45.4	39.0
Sub. Div. 22 + 24										
Denmark	15.9	14.0	32.5	33.1	21.7	13.6	25.2	26.9	38.0	39.5
Germany	54.6	60.0	53.1	54.7	56.4	45.5	15.8	15.6	11.1	11.4
Poland	16.7	12.3	8.0	6.6	8.5	9.7	5.6	15.5	11.8	6.3
Sweden	11.4	5.9	7.8	4.6	6.3	8.1	19.3	22.3	16.2	7.4
Total	98.6	92.2	101.4	99.0	92.9	76.9	65.9	80.3	77.1	64.6
Sub. Div. 23										
Denmark	6.8	1.5	0.8	0.1	1.5	1.1	1.7	2.9	3.3	1.5
Sweden	1.1	1.4	0.2	0.1	0.1	0.1	2.3	1.7	0.7	0.3
Total	7.9	2.9	1.0	0.2	1.6	1.2	4.0	4.6	4.0	1.8
Grand Total	349.0	307.5	336.2	432.4	286.4	279.9	257.8	311.4	294.9	234.4

* Preliminary data.

Table 3.13.3 a.2

Herring in Sub-divisions 22-24 and Division IIIa (Spring spawners).

Year	Landings
1974	200
1975	106
1976	86
1977	89
1978	124
1979	124
1980	143
1981	158
1982	151
1983	224
1984	261
1985	247
1986	186
1987	175
1988	251
1989	186
1990	204
1991	192
1992	168
1993	171
1994	164
Average	172
Unit	1000 tonnes

Table 3.13.3 b.1 Catches of HERRING, Sub-divisions 25-29 (including Gulf of Riga) and 32. Catches as reported to the Working Group ('000 t).

Country	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Denmark	11.9	13.9	19.4	10.6	14.1	15.3	10.5	6.5	7.6	3.9	4.2	10.8	7.3	4.6	6.8	8.1	8.9	11.9
Estonia															32.7	29.7	32.7	32.7
Finland	33.7	38.3	40.4	44.0	42.5	47.5	59.1	54.1	54.2	49.4	50.4	58.1	50.0	26.9	18.1	30.0	32.3	35.0
Germany	0.0	0.1	0.0	0.0	1.0	1.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Latvia															33.3	25.8	25.4	26.0
Lithuania															6.5	4.6	3.0	4.0
Poland	57.2	61.3	70.4	58.3	51.2	63.0	67.1	65.8	72.8	67.8	55.5	57.2	51.8	52.3	47.1	39.2	41.1	46.0
Russia	137.0	130.6	118.1	118.0	110.2	99.2	84.6	105.6	110.8	115.7	113.8	122.8	121.8	116.2	31.9	29.5	21.6	16.0
Sweden	48.7	55.4	71.3	72.5	72.9	83.8	78.6	56.9	42.5	29.7	25.4	33.4	55.4	44.2	36.5	43.0	66.4	61.0
Total	313.7	305.2	323.1	304.4	294.0	311.1	302.0	289.9	289.5	268.3	251.9	286.3	289.9	244.2	212.8	209.9	231.4	243.0

¹Preliminary.

Table 3.13.3 b.2 Herring in Fishing Areas 25 to 32

Year	Landings
1974	310
1975	313
1976	318
1977	314
1978	305
1979	323
1980	304
1981	294
1982	311
1983	302
1984	290
1985	289
1986	268
1987	252
1988	286
1989	290
1990	244
1991	213
1992	210
1993	231
1994	243
Average	281
Unit	tonnes

Table 3.13.3 c.1 Catches of herring ('000 t) in the Baltic by country and Sub-division 1993 and 1994

Year and	Total	Sub-division										
country	catch	22	23	24	25	26	27	28	29	30	31	32
1993												
Denmark	49.8	14.6	3.3	23.0	8.9							
Estonia	32.7							9.6	4.9			18.2
Finland	77.7						0.0	0.7	23.3	36.6	8.8	8.3
Germany	11.0	2.1		8.9								
Latvia	25.4					0.7	0.0	24.7				
Lithuania	3.0					3.0						
Poland	52.9			11.8	25.9	15.2						
Russia	21.6					10.6	3.5					7.5
Sweden	87.2		0.7	16.2	16.7	8.6	20.9	20.2		3.5	0.4	
Total	361.4	16.7	4.0	59.9	51.5	38.1	24.5	55.2	28.2	40.1	9.2	34.0
1994 ¹												
Denmark	52.3	2	1.5	39.5	11.3							
Estonia	33.7							9.9	6.8			17.0
Finland	92.3				0.0		0.2	1.9	27.6	49.1	4.1	9.5
Germany	15.1	2		11.4	3.7							
Latvia	26.2					0.8		25.3				
Lithuania	4.9					4.9						
Poland	52.4			6.3	28.4	17.7						
Russia	16.7					8.0	1.5					7.2
Sweden	72.5		0.3	7.7	24.7	4.4	20.5	9.8	2.2	2.5	0.4	
Total	366.0	0.0	1.8	64.9	68.0	35.8	22.1	46.9	36.5	51.6	4.5	33.8

¹ :Preliminary² :Included in value for Sd 24

Table 3.13.3 c.2 Herring in Sub-division 30, Bothnian Sea.

Year	Landings
1973	23
1974	20
1975	16
1976	22
1977	26
1978	25
1979	19
1980	20
1981	14
1982	18
1983	19
1984	26
1985	26
1986	26
1987	25
1988	28
1989	29
1990	31
1991	26
1992	39
1993	40
1994	52
Average	26
Unit	1000 tonnes

Table 3.13.3 d.1 Herring in Sub-division 31, Bothnian Bay.

Year	Landings
1973	3,976
1974	6,482
1975	5,547
1976	8,508
1977	7,330
1978	9,768
1979	7,060
1980	9,659
1981	7,826
1982	8,652
1983	7,707
1984	8,916
1985	9,312
1986	9,090
1987	8,108
1988	8,768
1989	4,437
1990	7,818
1991	6,800
1992	6,540
1993	9,167
1994	4,476
Average	7,543
Unit	tonnes

Table 3.13.4.1 Sprat catches in Sub-divisions 22-32. Data supplied by Working Group members.

Year	Sub-divisions 22-32							Total
	Denmark	Finland	German Dem. Rep.	Germany Fed. Rep.	Poland	Sweden	USSR	
1977	7,167	6,702	17,241	766	38,764	428	109,721	180,792
1978	10,815	6,052	13,710	784	24,692	800	75,521	132,382
1979	5,549	7,125	4,018	691	12,395	2,226	45,062	77,066
1980	4,738	6,191	141	541	12,735	2,834	31,359	58,089
1981	8,359	5,952	78	564	8,891	1,550	23,881	49,275
1982	6,662	4,537	1,022	632	14,209	2,750	18,866	48,678
1983	6,202	3,375	2,692	619	7,088	3,639	13,725	37,340
1984	3,179	2,400	2,761	663	9,254	8,397	25,891	52,545
1985	4,148	2,911	1,950	879	18,483	7,111	34,003	69,485
1986	5,954	3,235	2,514	473	23,653	3,469	36,484	75,782
1987	2,593	2,817	1,307	1,125	32,003	3,453	44,888	88,186
1988	1,972	3,025	1,234	330	22,236	7,345	44,181	80,323
1989	5,239	2,752	1,166	565	18,648	3,450	53,996	85,816
1990	801	2,734	518	789	13,296	7,478	60,002	85,638
1991	9,994	1,642	-	706	22,501	8,666	59,677 ¹	103,186

Year	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Russia	Sweden	Total
1992	24,339	4,138	1,764	584	17,398	3,298	28,343	8,104	54,200	142,168
1993	18,423	5,752	1,696	643	12,553	3,300	31,765	11,241	92,700	178,073
1994 ²	60,618	9,589	1,989	351	20,132	4,128	41,278	17,610	135,200	290,895

¹Sum of catches by Estonia, Latvia, Lithuania and Russia.

²Provisional data.

Table 3.13.4.2 Sprat catches in the Baltic Sea by country and Sub-division.

Year 1993												
Country	Total catch	22	23	24	25	26	27	28	29	30	31	32
Denmark	18423	2564		195	15664							
Estonia	5752								2133			3619
Finland	1696								1288	11		397
Germany	643	427		216								
Latvia	12553					2192		10361				
Lithuania	3300					3300						
Poland	31765			23	9635	22107						
Russia	11241					11241						
Sweden	92700			4300	11200	20300	26500	30400				
Total	178073	2991	0	4734	36499	59140	26500	40761	3421	11	0	4016

Year 1994												
Country	Total catch	22	23	24	25	26	27	28	29	30	31	32
Denmark	60618	7956		3359	49303							
Estonia	9589							524	5448			3617
Finland	1989								1451	43		495
Germany	351	321		30								
Latvia	20132					3081		17051				
Lithuania	4128					4128						
Poland	41278			33	5415	35830						
Russia	17610					17610						
Sweden	135200			8300	28600	56600	10300	29900	1500			
Total	290895	8277	0	11722	83318	117249	10300	47475	8399	43	0	4112

Table 3.13.4.3 Sprat in Sub-divisions 22–32.

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3–5
1974	51,509	887	242	0.322
1975	22,942	786	201	0.331
1976	217,802	558	195	0.309
1977	50,713	914	211	0.280
1978	17,628	774	132	0.275
1979	43,771	431	78	0.204
1980	22,477	233	58	0.249
1981	55,118	164	47	0.148
1982	34,861	186	49	0.270
1983	138,871	235	37	0.123
1984	66,437	451	53	0.183
1985	38,173	521	69	0.185
1986	15,139	469	75	0.225
1987	48,719	361	88	0.263
1988	9,528	369	80	0.241
1989	54,147	387	86	0.228
1990	50,824	554	86	0.125
1991	62,642	737	103	0.144
1992	78,085	992	142	0.219
1993	83,239	1,262	178	0.116
1994	25,878	1,262	291	0.234
Average	56,595	597	119	0.223
Unit	Millions	1000 tonnes	1000 tonnes	–

Table 3.13.5.1 Total catch (t) of COD by countries in Sub-divisions 22-32.

Year	Denmark	Estonia	Finland	German Dem. Rep.	German Fed. Rep.	Latvia	Lithuania	Poland	Russia	Sweden	USSR	Faroe Islands	Un-allocated ³	Total
1965	35,313	-	23	10,680	15,713	-	-	41,498	-	21,705	22,420	-	-	147,352
1966	37,070	-	26	10,589	12,831	-	-	56,007	-	22,525	38,270	-	-	177,318
1967	39,105	-	27	21,027	12,941	-	-	56,003	-	23,363	42,980	-	-	196,446
1968	44,109	-	70	24,478	16,833	-	-	63,245	-	24,008	43,610	-	-	216,353
1969	44,061	-	58	25,979	17,432	-	-	60,749	-	22,301	41,580	-	-	212,160
1970	42,392	-	70	18,099	19,444	-	-	68,440	-	17,756	32,250	-	-	198,451
1971	46,831	-	53	10,977	16,248	-	-	54,151	-	15,670	20,910	-	-	164,840
1972	59,717	-	76	13,720	15,516	-	-	57,093	-	16,471	30,140	-	-	192,733
1973	66,050	-	95	14,408	28,706	-	-	49,790	-	18,389	20,083	-	-	197,521
1974	57,810	-	160	10,970	22,224	-	-	48,650	-	16,435	38,131	-	-	194,386
1975	62,524	-	298	14,742	24,880	-	-	69,318	-	17,965	49,289	-	-	239,016
1976	77,570	-	287	8,552	26,626	-	-	70,466	-	20,188	49,047	-	-	252,736
1977	73,505	-	310	10,967	30,806	-	-	47,702	-	18,127	29,680	-	-	211,097
1978	50,611	-	1,437	9,345	15,122	-	-	64,113	-	16,793	37,200	-	-	194,621
1979	59,704	-	2,938	8,997	19,375	-	-	79,754	-	23,093	75,034	3,850	-	272,745
1980	75,529	-	5,962	7,406	18,407	-	-	123,486	-	33,201	124,350	1,250	-	389,591
1981	92,648	-	5,681	12,936	18,281	-	-	120,901	-	44,330	87,746	2,765	-	385,288
1982	91,927	-	8,126	11,368	21,860	-	-	92,541	-	46,548	86,906	4,300	-	363,576
1983	107,624	-	8,927	10,521	25,154	-	-	76,474	-	53,740	92,248	6,065	-	380,753
1984	113,701	-	9,358	9,886	42,031	-	-	93,429	-	65,927	100,761	6,354	-	441,447
1985	107,627	-	7,224	6,593	31,798	-	-	63,260	-	54,723	78,127	5,890	-	355,242
1986	98,464	-	5,633	3,179	22,422	-	-	43,236	-	49,572	52,148	4,596	-	279,250
1987	83,844	-	3,007	5,114	18,816	-	-	32,667	-	47,429	39,203	5,567	-	235,647
1988	74,742	-	2,904	4,634	18,295	-	-	33,351	-	54,968	28,137	6,915	-	223,946
1989	65,935	-	2,254	2,147	15,342	-	-	36,855	-	55,919	14,722	4,520	-	197,654
1990	56,700	-	1,731	1,629 ²	7,745	-	-	32,028	-	54,474	13,461	3,558	-	171,326
1991	50,606	1,810	1,712	-	9,443	2,627	1,865	25,748	3,299	39,491	-	2,611	-	139,212
1992	30,420	1,368	485	-	6,449	1,250	1,266	13,314	1,793	15,940	-	605	-	72,890
1993	11,707	70	225	-	5,126	1,333	605	8,909	892	12,048	-	-	18,978	59,893
1994	19,805	952	594	-	7,079	2,379	1,887	14,426	1,257	25,530	-	-	44,000	117,909

¹Provisional data.²Includes landings from October-December 1991 in former GDR.³Working Group estimates.

Table 3.13.5.2

Total catch (t) of COD in Sub-divisions 22-32 by sub-division and country.

Year	Denmark				Faroe Islands		Finland			
	22	23	24	25-28	25-28	25-28	29	30 ²	31	32
1972	17,717	-	7,928	34,072	-	-	-	76	-	-
1973	21,400	-	9,195	35,455	-	-	-	95	-	-
1974	18,300	-	7,482	32,028	-	-	-	160	-	-
1975	15,981	-	7,500	39,043	-	-	270	8	-	20
1976	19,764	712	9,682	47,412	-	-	81	24	-	182
1977	17,726	1,166	10,213	44,400	-	-	85	26	-	199
1978	12,641	1,177	6,527	30,266	-	-	249	323	6	859
1979	16,093	2,029	7,232	34,350	3,850	-	707	518	16	1,697
1980	16,033	2,425	7,367	49,704	1,250	-	2,163	880	45	2,874
1981	15,502	1,473	7,152	68,521	2,765	-	3,036	684	11	1,950
1982	11,669	1,638	7,469	71,151	4,300	-	4,557	1,368	42	2,159
1983	14,100	1,257	7,861	84,406	6,065	-	5,322	2,013	36	1,556
1984	13,867	1,703	8,042	90,089	6,334	-	5,433	2,741	7	1,177
1985	15,563	1,076	7,461	83,527	5,890	-	4,646	1,706	7	865
1986	8,914	748	7,281	81,521	4,596	-	3,571	1,306	2	754
1987	7,990	1,503	5,470	68,881	5,567	-	1,389	1,143	2	473
1988	5,680	1,121	7,505	60,436	6,915	614	998	1,257	1	34
1989	3,422	636	4,637	57,240	4,520	392	603	1,097	1	161
1990	3,235	722	5,349	47,394	3,558	833	187	685	-	26
1991	5,536	1,431	3,847	39,792	2,611	1,061	228	404	-	18
1992	7,567	2,449	2,379	18,025	605	253	48	174	-	10
1993	4,901	1,001	3,765	2,040	-	61	11	142	2	9
1994 ¹	6,078	1,073	7,753	4,901	-	232	240	108	-	14

Year	Federal Republic of Germany						German Democratic Republic						
	22	24	25	26	27	28	22	24	25	26	27	28	29
1972	10,531	1,782	3,193	10	-	-	4,560	5,105	1,950	2,072	-	33	-
1973	12,833	900	9,100	5,200	-	673	4,004	4,370	4,065	1,912	-	57	-
1974	9,998	395	5,242	5,769	-	820	3,028	5,431	1,469	996	-	52	-
1975	12,415	497	8,809	1,975	-	1,184	3,471	2,571	3,320	5,250	50	60	20
1976	12,312	581	7,526	4,490	-	1,717	1,292	3,290	800	3,150	10	10	-
1977	10,807	879	3,649	13,803	-	1,668	977	2,471	324	5,996	73	1,119	7
1978	9,972	880	2,178	1,793	-	299	1,619	5,466	414	1,714	1	131	-
1979	8,910	688	7,616	2,149	-	12	1,024	6,570	54	1,301	1	46	1
1980	5,968	689	10,985	673	-	92	880	4,700	5	1,818	-	3	-
1981	9,095	2,165	7,021	-	-	-	1,743	9,916	2	1,275	-	-	-
1982	7,394	666	13,069	662	-	69	1,908	8,707	-	728	-	25	-
1983	8,937	323	14,179	1,599	-	116	1,441	7,656	-	1,402	-	22	-
1984	11,340	208	21,948	7,926	-	609	1,851	6,242	-	1,793	-	-	-
1985	4,992	531	12,733	11,572	-	1,970	1,508	3,870	-	1,215	-	-	-
1986	2,236	666	10,545	8,399	-	576	825	2,173	1	180	-	-	-
1987	3,611	645	7,757	5,009	-	1,794	504	4,392	1	217	-	-	-
1988	3,670	547	11,321	2,577	-	180	330	4,302	1	1	-	-	-
1989	2,099	399	12,201	640	-	3	217	1,927	3	-	-	-	-
1990	1,997	1,057	3,232	1,427	-	32	129 ⁵	1,500 ⁵	+	-	-	-	-
1991	1,648	1,231	5,419	1,114	8	23	-	-	-	-	-	-	-
1992	2,320	1,336	2,187	586	-	20	-	-	-	-	-	-	-
1993	2,395	1,689	902	140	-	-	-	-	-	-	-	-	-
1994 ¹	2,151	1,872	2,858	134	-	64	-	-	-	-	-	-	-

Table 3.13.5.2 (cont'd)

Year	Poland			Sweden								3
	24	25 ^a	26	23	24	25	26	27 ^a	28	29	30	
1972	24,926	32,167	-	-	1,277	13,842	-	876	440	-	36	
1973	29,010	20,780	-	-	1,655	15,224	-	971	485	-	54	
1974	25,221	23,429	-	-	1,937	11,950	-	1,682	825	-	41	
1975	35,373	33,945	-	-	1,932	12,511	-	2,052	1,367	103	-	
1976	26,082	44,384	-	-	1,800	14,109	-	1,979	2,180	115	5	
1977	18,172	29,530	550	-	1,516	11,775	-	2,584	1,560	120	22	
1978	31,161	32,952	600	-	1,730	9,017	26	3,207	1,740	417	55	
1979	40,146	39,608	700	-	1,800	13,628	50	3,458	2,665	641	145	
1980	50,832	72,654	1,300	-	2,610	18,694	88	6,014	3,185	790	516	
1981	50,698	70,203	900	-	5,700	24,600	260	7,200	4,450	712	500	
1982	41,830	50,711	140	-	7,933	20,429	2,279	4,109	9,264	687	1,669	3
1983	35,153	41,321	120	-	6,910	27,630	1,810	6,490	9,200	1,260	320	
1984	35,261	58,168	228	-	6,014	33,493	4,413	8,223	11,947	1,338	271	
1985	19,332	43,928	263	-	4,895	22,737	8,170	7,068	9,523	1,115	929	2
1986	18,297	24,939	227	-	3,622	19,214	7,764	7,554	9,606	1,233	298	5
1987	12,254	20,413	137	-	4,314	15,173	7,833	5,708	7,507	903	5,817	3
1988	14,910	18,441	155	-	5,849	20,893	7,453	6,674	7,946	535	5,456	
1989	20,819	16,036	192	-	4,987	28,068	6,742	7,703	6,829	440	927	3
1990	14,528	17,500	120	-	3,671	23,311	13,512	6,702	6,525	252	353	2
1991	9,853	15,895	232	-	2,768	18,413	7,034	5,096	5,548	180	207	1
1992	5,449	7,865	290	-	1,655	7,169	2,133	2,145	2,153	93	301	
1993	5,039	3,870	274	-	1,675	5,872	2,161	940	972	40	114	
1994 ¹	9,750	4,676	555	-	3,711	16,675	846	2,845	842	17	39	

Year	USSR						Un-allocated	Total
	25	26	27	28	29	32		
1972	-	23,951	-	6,189	-	-		192,733
1973	-	8,768	1	11,250	50	14		197,521
1974	811	18,633	-	17,677	1,010	-		194,386
1975	946	17,884	3	28,677	1,735	44		239,016
1976	8,855	25,302	126	14,645	106	13		252,736
1977	390	17,880	4	11,304	91	11		211,097
1978	12	18,010	78	18,623	166	311		194,621
1979	13	30,776	-	39,875	1,575	2,795		272,745
1980	7	45,734	-	59,892	4,575	14,142		389,591
1981	2	44,254	-	32,195	3,733	7,562		385,288
1982	5	33,221	-	40,876	3,308	9,496		363,576
1983	-	33,600	-	39,464	6,095	13,089		380,753
1984	-	39,871	-	43,802	6,185	10,903		441,447
1985	-	32,096	-	27,137	8,822	10,072		355,242
1986	-	22,818	-	21,840	3,289	4,201		279,250
1987	-	22,652	-	11,457	1,654	3,440		235,647
1988	-	15,928	-	10,868	172	1,169		223,946
1989	-	8,440	-	6,058	121	103		197,694
1990	-	10,020	-	3,420	3	18		171,310
1991	-	-	-	-	-	-		139,212
1992	-	-	-	-	-	-		72,890
1993	-	-	-	-	-	-	18,978	59,893
1994 ¹	-	-	-	-	-	-	44,000	117,909

Table 3.13.5.2 (cont'd)

Year	Estonia					Latvia				Lithuania		Russia		
	25	26	28	29	32	25	26	28	29	26	28	26	28	32
1991		1,537	273	-	-		1,190	1,432	-	1,854	11	3,034	264	1
1992		1,011	352	5	-		383	867	-	1,266	-	1,793	-	-
1993		61	8	-	1		761	572	-	605	-	892	-	-
1994 ¹	147	579	208	17	1	530	1360	489	-	1,887	-	1,257	-	-

¹Provisional. ²Finland: 1972-1974, Sub-divisions combined. ³Sweden: 1972-1974, Sub-divisions combined.

⁴Poland: some catches from Sub-division 24 included. ⁵Includes landings from October-December 1990.

Table 3.13.5 a.1 Total catch (t) of COD in Sub-divisions 22, 23, and 24.

Sweden	Denmark		German Dem.Rep	Germany, Fed.Rep.	Poland	Sweden		Total			
	23	22 + 24	22 + 24	22 + 24	24	23	24	22	23	24	22 + 24
1965		19,457	9,705	13,350		-	2,182	27,867	-	7,007	44,874
1966		20,500	8,393	11,448		-	2,110	27,864	-	14,587	42,451
1967		19,181	10,007	12,884		-	1,996	28,875	-	15,193	44,068
1968		22,593	12,360	14,815		-	2,113	32,911	-	18,970	51,881
1969		20,602	7,519	12,717		-	1,413	29,082	-	13,169	42,251
1970		20,085	7,996	14,589		-	1,289	31,363	-	12,596	43,959
1971		23,715	8,007	13,482		-	1,419	32,119	-	14,504	46,623
1972		25,645	9,665	12,313		-	1,277	32,808	-	16,092	48,900
1973		30,595	8,374	13,733		-	1,655	38,237	-	16,120	54,357
1974		25,782	8,459	10,393		-	1,937	31,326	-	15,245	46,571
1975		23,481	6,042	12,912		-	1,932	31,867	-	12,500	44,367
1976	712	29,446	4,582	12,893		-	1,800	33,368	712	15,353	48,721
1977	1,166	27,939	3,448	11,686		550	1,516	29,510	1,716	15,079	44,589
1978	1,177	19,168	7,085	10,852		600	1,730	24,232	1,777	14,603	38,835
1979	2,029	23,325	7,594	9,598		700	1,800	26,027	2,729	16,290	42,317
1980	2,425	23,400	5,580	6,652		1,300	2,610	22,881	3,725	15,366	38,247
1981	1,473	22,654	11,659	11,260		900	5,700	26,340	2,373	24,933	51,273
1982	1,638	19,138	10,615	8,060		140	7,933	20,971	1,778	24,775	45,746
1983	1,257	21,961	9,097	9,260		120	6,910	24,478	1,377	22,750	47,228
1984	1,703	21,909	8,093	11,548		228	6,014	27,058	1,931	20,506	47,564
1985	1,076	23,024	5,378	5,523		263	4,895	22,063	1,339	16,757	38,820
1986	748	16,195	2,998	2,902		227	3,622	11,975	975	13,742	25,717
1987	1,503	13,460	4,896	4,256	-	137	4,314	12,105	1,640	14,281	26,926
1988	1,121	13,185	4,632	4,217	-	155	5,849	9,680	1,276	18,203	27,883
1989	636	8,059	2,145	2,498	-	192	4,987	5,738	828	11,637	17,689
1990	722	8,584	1,629 ²	3,054	-	120	3,671	5,361	842	11,577	16,938
1991	1,431	9,383	-	2,879	-	232	2,768	7,184	1,663	7,846	15,030
1992	2,449	9,946	-	3,656	-	290	1,655	9,887	2,739	5,370	15,257
1993	1,001	8,666	-	4,084	-	274	1,675	7,296	1,275	6,896	^a 17,842
1994	1,073	13,831	-	4,023	91	555	3,711	8,229	1,628	13,427	^a 27,216

¹Provisional data.

²Includes landings from October-December 1990 in the former GDR.

^aUnallocated for 1993: 3,650; 1994: 6,000

Table 3.13.5 a.2 Cod in Fishing Areas 22-24.

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-6
1970	139	37	44	0.927
1971	109	45	47	0.996
1972	148	47	49	1.295
1973	57	45	54	0.993
1974	143	49	47	1.331
1975	76	36	44	1.110
1976	67	48	49	1.441
1977	119	33	45	1.408
1978	84	28	39	1.001
1979	39	40	42	0.898
1980	102	46	38	0.932
1981	74	41	51	1.334
1982	78	39	46	0.838
1983	95	41	47	0.926
1984	31	38	48	0.812
1985	24	40	39	1.237
1986	68	24	25	1.745
1987	39	17	28	1.051
1988	12	24	28	0.975
1989	18	22	18	1.148
1990	15	14	17	1.336
1991	21	9	15	2.072
1992 ¹	45	7	15	1.543
1993 ¹	37	10	18	1.854
1994 ¹	26	16	27	1.533
Average	67	32	37	1.229
Unit	Millions	1000 tonnes	1000 tonnes	-

¹) Estimates uncertain.

Table 3.13.5 b.1 Total catch (t) of COD by countries in Sub-divisions 25-32.

Year	Denmark	Estonia	Finland	German Dem. Rep.	Germany, Fed. Rep.	Latvia	Lithuania	Poland	Russia	Sweden	USSR	Faroe Islands	Un-allocated ³	Total
1965	15,856	-	23	975	2,183	-	-	41,498	-	19,523	22,420	-	-	102,478
1966	16,570	-	26	2,1969	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	3,204	-	-	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	-	330,742
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	29,577	-	-	93,429	-	59,685	100,761	6,354	-	391,046
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	-	194,477
1989	57,240	-	2,254	3	12,844	-	-	36,855	-	50,739	14,722	4,520	-	179,172
1990	47,394	-	1,731	+	4,691	-	-	32,028	-	50,683	13,461	3,558	-	152,870
1991	39,792	1,810	1,712	-	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	-	605	-	54,894
1993	2,040	70	225	-	1,942	1,333	605	8,909	892	10,099	-	-	-	38,117
1994 ¹	4,901	952	594	-	3,056	2,379	1,887	14,335	1,257	21,264	-	-	13,450	89,286
													38,661	

¹Provisional data.

²Includes landings from October-December 1991 in former GDR.

³Working Group estimates

Table 3.13.5 b2 **Cod in Fishing Areas 25-32**

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 3-7
1975	368	454	195	0.557
1976	588	463	203	0.662
1977	984	451	165	0.560
1978	711	546	154	0.379
1979	509	802	228	0.374
1980	822	907	346	0.536
1981	807	875	326	0.553
1982	535	899	314	0.529
1983	345	844	329	0.519
1984	288	818	395	0.683
1985	302	667	316	0.583
1986	404	489	252	0.819
1987	249	398	217	0.729
1988	142	372	194	0.701
1989	135	295	179	0.924
1990	71	229	154	0.975
1991	155	158	122	1.190
1992 ¹	234	90	55	0.872
1993 ¹	227	106	38	0.303
1994 ¹	220	228	89	0.660
Average	405	505	214	0.655
Unit	Millions	1000 tonnes	1000 tonnes	-

¹Values uncertain (based on medium level of assumed catch in 1993-1994).

Table 3.13.6.1 Total catch (in tonnes) of FLOUNDER in the Baltic, by sub-divisions and country. (There are some gaps in the information. The "Total", therefore, is preliminary.)

Year	Denmark ¹			Finland			German Dem. Rep.			Germany, Fed. Rep.			Poland			Sweden ³					
	22	23	24(25)	29	30	32	22	24	25(+26)	22	24(+25)	26	25(+24)	26	23	24	25	26	27	28	29
1973	1,983	-	386	-	-	-	181	1,624	1,516	349	4	-	1,580	2,070	-	502	-	-	-	-	-
1974	2,097	-	2,578	-	-	-	165	1,482	654	304	3	-	1,635	2,473	-	470	-	-	-	-	-
1975	1,992	-	1,678	113	22	47	163	1,469	406	469	1	-	1,871	2,585	-	400	-	-	-	-	-
1976	2,038	-	482	118	23	59	174	1,556	901	392	2	-	1,549	2,289	-	400	-	-	-	-	-
1977	1,974	-	389	115	32	56	555	2,708	1,096	393	4	-	2,071	2,089	-	416	-	-	-	-	-
1978	2,965	-	415	174	61	155	348	2,572	-	477	1	-	996	2,106	-	346	-	-	-	-	-
1979	2,451	-	405	192	54	153	189	2,509	-	259	3	-	1,230	1,860	-	315	-	-	-	-	-
1980	2,185	-	286	194	69	165	138	2,775	-	212	1	-	1,613	1,380	16	46	-	20	181	32	32
1981	1,964	-	548	227	56	135	271	2,595	-	351	1	-	1,151	1,541	21	30	-	21	194	34	34
1982	1,563	104	257	219	58	144	263	3,202	-	248	1	-	2,484	1,623	22	33	-	65	16	3	3
1983	1,714	115	450	181	67	120	280	3,572	-	418	1	-	1,828	905	72	108	-	212	52	9	9
1984	1,733	85	306	174	108	135	349	2,719	-	371	1	-	2,471	1,288	18	27	-	53	13	2	2
1985	1,561	130	649	157	97	137	236	3,253	-	199	4	-	2,063	1,302	16	24	-	47	12	2	2
1986	1,525	65	1,558	199	128	181	127	2,838	-	125	10	-	3,030	1,784	20	31	-	60	15	3	3
1987	1,208	122	1,007	159	106	143	71	2,096	-	114	11	-	2,530	1,745	17	26	-	51	13	2	2
1988	1,162	125	990	177	118	159	92	2,981	-	133	5	-	1,728	1,292	23	35	-	68	17	3	3
1989	1,321	83	1,062	175	122	163	126	3,616	-	122	2	-	1,896	1,089	22	34	-	66	16	3	3
1990	941	-	1,389	182	125	167	52	1,622	-	183	10	-	1,617	599	-	120	-	-	-	-	-
1991	925	-	1,497	236	82	167	-	-	-	246	1,814	-	2,008	1,905	24	31	-	88	20	-	-
1992	713	185	975	405	40	627	-	-	-	227	1,972	-	1,877	1,869	41	88	3	86	11	3	3
1993	649	194	635	438	57	683	-	-	-	235	1,230	-	3,276	1,229	26	27	63	1	83	10	-
1994	882	181	1,016	442	98	652	-	-	-	333	3,066	29	3,177	1,266	84	20	18	37	33	55	10

-(cont'd)

Table 3.13.6.1 (cont'd)

Year	USSR				Estonia				Latvia		Lithuania		Russia		Total									
	26	28	29	3	26	28	29	32	26	28	2	26	28	22	23 ⁴	24	25	26	27	28	29	30	32	22-32
1973	-	2,610	-											2,513	-	2,014	3,598	2,070	-	2,610	-	-	-	- 12,805
1974	-	2,510	-											2,566	-	4,063	2,759	2,473	-	2,510	-	-	-	- 14,371
1975	-	6,455	-											2,624	-	3,148	2,677	2,585	-	6,455	113	22	-	- 17,624
1976	471	1,779	409	35										2,604	-	2,040	2,850	2,760	-	1,779	527	23	418	13,001
1977	210	1,081	321	41										2,922	-	3,101	3,583	2,299	-	1,081	436	32	470	13,924
1978	288	1,290	334	39										3,790	-	2,988	1,342	2,394	-	1,290	508	61	550	12,923
1979	158	1,170	330	1,01										2,899	-	2,917	1,545	2,018	-	1,170	522	54	1,165	12,290
1980	93	798	334	1,08										2,535	-	3,078	1,659	1,473	20	979	560	69	1,245	11,618
1981	58	742	445	1,07										2,586	-	3,165	1,181	1,599	21	936	706	56	1,213	11,463
1982	195	665	615	1,12										2,074	104	3,482	2,517	1,818	65	681	837	58	1,265	12,901
1983	209	551	497	1,11										2,412	115	4,095	1,936	1,114	212	603	687	67	1,234	12,475
1984	145	202	286	1,22										2,453	85	3,044	2,498	1,433	53	215	462	108	1,361	11,712
1985	268	189	265	80										1,996	130	3,922	2,087	1,570	47	201	424	97	943	11,417
1986	442	159	281	55										1,777	65	4,399	3,061	2,226	60	174	483	128	737	13,110
1987	1,315	203	279	39										1,393	122	3,131	2,556	3,060	57	216	440	106	540	11,615
1988	578	439	257	33										1,387	125	3,999	1,763	1,870	68	456	437	118	490	10,713
1989	783	512	214	21										1,569	83	4,702	1,930	1,872	66	528	392	122	377	11,641
1990	752	390	144	14										1,176	-	3,021	1,737	1,351	-	390	326	125	308	8,434
1991	-	-	-		49	1	135	5	123	323	12	216	10	1,171	-	3,335	2,039	2,418	88	354	371	82	218	10,076
1992	-	-	-		-	47	47	4	26	664	48	146	-	940	165	2,988	1,965	2,527	86	722	455	40	673	10,561
1993 ⁵	-	-	-		-	52	86	5	99	389	- ⁶	225	-	884	220	1,892	3,339	1,562	83	430	524	57	738	9,742
1994					-	+	3		31	276	- ⁶	167	-	1,215	265	4,102	3,195	1,503	33	331	455	98	656	11,853

¹For the years 1970-1981 catches in Sub-division 23 are included in Sub-division 22.²Includes landings from October-December.³For the years 1973-1979 and 1990 catches in Sub-divisions 24-29 are included in Sub-division 25.⁴For the years 1973-1981 catches in Sub-division 23 are included in Sub-division 22.⁵Provisional.⁶Not reported.

Table 3.13.7.1 Total catch (in tonnes) of PLAICE in the Baltic by Sub-division and country. (There are some gaps in the information. The "Total", therefore, is preliminary.)

Year	Denmark		German ¹ Dem.Rep.		Federal Rep. of Germany		Poland		Sweden ²					Total										
	22	24(+25)	22	24	22	24(+25)	25(+24)	26	23	24	25	27	28	29	22	23	24	25	26	27	28	29	22-28	
1970	3,757	494	-	-	202	16	-	-	149	-	-	-	-	-	3,959	-	659	-	-	-	-	-	-	4,618
1971	3,435	314	-	-	160	2	-	-	107	-	-	-	-	-	3,595	-	423	-	-	-	-	-	-	4,018
1972	2,726	290	-	-	154	2	-	-	78	-	-	-	-	-	2,880	-	370	-	-	-	-	-	-	3,250
1973	2,399	203	2	44	163	1	174	30	75	-	-	-	-	-	2,564	-	323	174	-	-	-	-	-	3,091
1974	3,440	126	36	10	166	2	114	86	60	-	-	-	-	-	3,642	-	198	114	-	-	-	-	-	4,040
1975	2,814	184	11	67	302	1	158	142	45	-	-	-	-	-	3,127	-	297	158	-	-	-	-	-	3,724
1976	3,328	178	11	82	302	3	164	76	44	-	-	-	-	-	3,641	-	307	164	-	-	-	-	-	4,188
1977	3,452	221	5	36	348	2	265	26	41	-	-	-	-	-	3,805	-	300	265	-	-	-	-	-	4,396
1978	3,848	681	33	1,198	346	3	633	290	32	-	-	-	-	-	4,227	-	1,914	633	-	-	-	-	-	7,064
1979	3,554	2,027	10	1,604	195	7	555	224	113	-	-	-	-	-	3,759	-	3,751	555	-	-	-	-	-	8,289
1980	2,216	1,652	5	303	84	5	383	53	113	-	-	-	-	-	2,305	-	2,073	383	53	-	-	-	-	4,814
1981	1,193	937	6	52	74	31	239	27	118	-	-	-	-	-	1,273	-	1,138	239	27	-	-	-	-	2,677
1982	716	393	6	25	39	6	43	64	40	6	7	1	-	-	761	-	464	49	64	7	1	-	-	1,346
1983	901	297	5	12	37	14	64	12	133	20	24	2	-	-	943	-	456	84	12	24	2	-	-	1,521
1984	803	166	7	2	23	8	106	-	23	3	4	1	-	-	833	-	199	109	-	4	1	-	-	1,146
1985	648	771	68	593	26	40	119	49	25	4	5	1	-	-	742	-	1,429	119	49	5	1	-	-	2,345
1986	570	1,019	34	372	25	7	171	59	48	7	9	1	-	-	629	-	1,446	171	59	9	1	-	-	2,315
1987	414	794	4	142	14	16	188	5	68	10	12	1	-	-	432	-	1,020	198	5	12	1	-	-	1,668
1988	234	323	3	16	7	1	9	1	49	7	9	1	-	-	244	-	389	16	1	9	1	-	-	660
1989	167	149	-	5	7	-	10	-	34	5	6	1	-	-	174	-	188	15	-	6	1	-	-	384
1990	236	100	0	1 ³	9	1	6	0	50	-	-	-	-	-	245	-	152	6	-	-	-	-	-	403
1991	328	112	-	-	15	9	2	1	5	2	2	-	-	-	343	-	126	4	1	2	-	-	-	476
1992	316	74	-	-	11	4	6	+	3	1	1	+	+	+	327	-	81	7	+	1	+	+	+	416
1993	171	66	-	-	16	6	4	+	2	4	+	-	-	-	187	2	76	4	+	-	-	-	-	269
1994	355	159	-	-	1	+	43	4	4	4	7	-	+	+	356	6	163	50	4	-	+	+	+	579

¹Includes 1990 also landings from October-December.

²For the years 1970-1981 and 1990 catches in Sub-divisions 25-28 are included in Sub-division 24.

³Includes landings from Oct-Dec.

⁴Provisional.

Table 3.13.8.1 Total catch of DAB in the Baltic by sub-division and country (in tonnes). (There are some gaps in the information. The "Total", therefore, is preliminary).

Year	Denmark		German ¹ Dem. Rep.		Fed. Rep. of Germany		Sweden ²					Total											
	22	24(+25)	22	24	22	24	23	24	25	27	28	29	30	22	23	24	25	27	28	29	30	22-28	
1970	845	20	11	-	74	-	-	+	-	-	-	-	-	930	-	20	-	-	-	-	-	-	950
1971	911	26	10	-	64	-	-	+	-	-	-	-	-	985	-	26	-	-	-	-	-	-	1,011
1972	1,110	30	9	-	63	-	-	23	-	-	-	-	-	1,182	-	53	-	-	-	-	-	-	1,235
1973	1,087	58	18	-	118	-	-	30	-	-	-	-	-	1,223	-	88	-	-	-	-	-	-	1,311
1974	1,178	51	18	-	118	-	-	34	-	-	-	-	-	1,314	-	85	-	-	-	-	-	-	1,399
1975	1,273	74	20	-	131	-	-	32	-	-	-	-	-	1,424	-	106	-	-	-	-	-	-	1,530
1976	1,238	60	17	-	114	-	-	27	-	-	-	-	-	1,369	-	87	-	-	-	-	-	-	1,456
1977	889	32	13	-	89	-	-	25	-	-	-	-	-	991	-	57	-	-	-	-	-	-	1,048
1978	928	51	19	14	128	4	-	-	-	-	-	-	-	1,075	-	69	-	-	-	-	-	-	1,144
1979	1,413	50	18	25	123	1	-	9	-	-	-	-	-	1,554	-	85	-	-	-	-	-	-	1,639
1980	1,593	21	15	25	101	+	-	3	-	-	-	-	-	1,709	-	49	-	-	-	-	-	-	1,758
1981	1,601	32	24	39	164	+	-	5	-	-	-	-	-	1,789	-	76	-	-	-	-	-	-	1,865
1982	1,863	50	46	38	182	4	-	6	5	8	6	-	1	2,001	-	98	5	8	6	-	-	1	2,209
1983	1,920	42	46	28	198	-	-	24	20	32	22	-	2	2,164	-	94	20	32	22	-	-	2	2,334
1984	1,796	65	30	47	175	2	-	4	3	5	4	-	1	2,001	-	118	3	5	4	-	-	1	2,132
1985	1,593	58	52	51	187	2	-	3	3	5	3	-	1	1,832	-	114	3	5	3	-	-	1	1,958
1986	1,655	85	36	35	185	1	-	1	1	1	1	-	-	1,876	-	122	1	1	1	-	-	-	2,001
1987	1,706	93	14	87	276	4	-	1	1	1	1	-	-	1,996	-	185	1	1	1	-	-	-	2,184
1988	1,846	75	22	91	281	1	-	1	1	1	1	-	-	2,149	-	168	1	1	1	-	-	-	2,320
1989	1,722	48	26	19	218	1	-	1	1	2	1	-	-	1,966	-	69	1	2	1	-	-	-	2,039
1990	1,743	146	14	11	252	1	-	8	-	-	-	-	-	2,009	-	166	-	-	-	-	-	-	2,175
1991	1,731	95	-	-	340	5	-	1	-	-	-	-	-	2,071	-	101	-	-	-	-	-	-	2,172
1992	1,406	81	-	-	409	6	-	+	1	1	+	4	-	1,406	-	87	1	1	+	1	+	1	1,496
1993	996	155	-	-	556	10	-	1	1	-	-	1	-	1,552	7	166	1	-	-	+	+	1	1,727
1994	1,621	163	-	-	1,190	81	-	1	1	1	-	+	-	2,811	5	245	1	-	-	+	+	+	3,062

¹Includes 1990 also landings from Oct-Dec.

²For the years 1970-1981 and 1990 catches in Sub-divisions 25-30 are included in Sub-division 24.

³United Germany.

⁴Provisional.

Table 3.13.9.1 Total catch of TURBOT in the Baltic, by sub-divisions and country (in tonnes). (There are some gaps in the information. The "Total", therefore, is preliminary.)

Year	Denmark			German ¹ Dem.Rep.	Germany, Fed.Rep.	Poland		Sweden ²					Russia	Total											
	22	23	24(+25)			24	22	24	25+(24)	26	23	24		25	26	27	28+(29)	26	22	23	24	25	26	27	28(+29)	22-28
1965	-	-	-	3	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
1966	16	21	21	5	-	53	-	-	-	-	-	-	-	-	-	21	-	74	-	-	-	-	-	-	95
1967	14	20	20	7	-	10	-	-	-	-	-	-	-	-	-	21	-	30	-	-	-	-	-	-	51
1968	14	18	18	3	-	67	-	-	-	-	-	-	-	-	-	17	-	85	-	-	-	-	-	-	102
1969	13	13	13	4	-	57	-	-	-	-	-	-	-	-	-	17	-	70	-	-	-	-	-	-	87
1970	11	13	13	5	-	40	-	-	2	-	-	-	-	-	-	16	-	55	-	-	-	-	-	-	71
1971	11	26	26	4	-	86	-	-	2	-	-	-	-	-	-	15	-	114	-	-	-	-	-	-	129
1972	10	26	26	3	-	100	-	-	3	-	-	-	-	-	-	13	-	129	-	-	-	-	-	-	142
1973	11	30	30	3	-	33	-	58 13	5	-	-	-	-	-	-	14	-	68	58	13	-	-	-	-	153
1974	14	40	40	2	-	23	-	34 36	6	-	-	-	-	-	-	16	-	69	54	36	-	-	-	-	155
1975	27	48	48	3	15	38	-	23 6	7	-	-	-	-	-	-	45	-	93	23	6	-	-	-	-	167
1976	29	24	24	0	11	52	-	14 12	7	-	-	-	-	-	-	40	-	83	14	12	-	-	-	-	149
1977	32	37	37	0	9	55	-	12 55	8	-	-	-	-	-	-	41	-	100	12	55	-	-	-	-	208
1978	33	37	37	2	9	27	-	7 3	10	-	-	-	-	-	-	44	-	74	7	3	-	-	-	-	128
1979	23	38	38	3	6	39	-	29 34	12	-	-	-	-	-	-	32	-	89	29	34	-	-	-	-	184
1980	28	38	38	0	9	30	-	12 20	15	-	-	-	-	-	-	37	-	83	12	20	-	-	-	-	152
1981	28	62	62	1	8	46	-	10 19	7	-	-	-	-	-	-	37	-	115	10	19	-	-	-	-	181
1982	31	51	51	1	7	27	-	2 17	3	4	-	4	-	3	-	39	-	81	6	17	4	3	3	150	
1983	33	40	40	3	8	9	-	5 4	31	41	-	-	35	24	-	44	-	80	46	4	35	24	24	233	
1984	41	45	45	4	12	8	-	13 2	3	4	-	-	3	2	-	57	-	56	17	2	3	2	2	137	
1985	56	34	34	5	15	22	-	67 15	4	5	-	-	4	3	-	76	-	60	72	15	4	3	3	230	
1986	99	81	81	6	25	32	-	32 37	6	8	-	-	7	5	-	130	-	119	40	37	7	5	5	338	
1987	134	93	93	4	30	34	-	155 21	8	11	-	-	9	6	-	168	-	135	166	21	9	6	6	505	
1988	117	117	117	3	34	28	-	7 10	12	16	-	-	14	9	-	154	-	157	23	10	14	9	9	367	
1989	135	109	109	7	20	22	-	- 11	11	15	-	-	13	9	-	161	-	142	15	11	13	9	351		
1990	178	181	181	4	26	2	-	24 25	14	-	-	-	-	-	-	208	-	197	24	25	-	-	-	454	
1991	228	137	137	-	44	39	-	73 20	2	12	-	-	16	-	-	272	-	178	85	36	16	9	9	596	
1992	267	127	127	-	55	68	-	80 55	12	12	-	+	21	36	-	322	-	207	92	55	21	36	36	733	
1993	159	29	152	-	74	56	-	520 72	2	4	14	+	13	38	34	233	31	212	535	105	13	38	38	1,167	
1994 ³	211	18	166	-	71	82	-	380 30	2	3	18	1	17	44	15	282	20	251	398	46	17	44	44	1,058	

¹Includes 1990 also landings from October-December.

²For the years 1970-1981 and 1990 catches in Sub-divisions 25-29 are included in Sub-division 24.

³Provisional.

Table 3.13.10.1 Total landings of BRILL (in tonnes). (There are some gaps in the information. The "Total", therefore, is preliminary.)

Year	Sub-division 22		23	Total	Sub-divisions 24-28		Total	Sub-divisions 22-28
	Denmark	Fed.Rep. of Germany	Denmark		Denmark	Sweden		Total
1970	4	-		4	-	-	-	4
1971	3	-		3	-	-	-	3
1972	7	-		7	-	-	-	7
1973	11	-		11	2	-	2	13
1974	25	-		25	1	-	1	26
1975	38	1		39	1	+	1	40
1976	45	2		47	1	-	1	48
1977	60	5		65	2	-	2	67
1978	37	3		40	-	-	-	40
1979	30	0		30	-	-	-	30
1980	26	0		26	-	-	-	26
1981	22	1		23	-	-	-	23
1982	19	0		19	0	17	17	36
1983	13	0		13	0	42	42	55
1984	12	0		12	-	3	3	15
1985	16	0		16	0	1	1	17
1986	15	0		15	0	3	3	18
1987	12	0		12	0	3	3	15
1988	5	0		5	0	1	1	6
1989	9	0		9	0	1	1	10
1990	0	0		0	-	1	1	1
1991	15	0		0	-	-	-	15
1992	28	0		28	-	-	-	28
1993	29	-	5	34	1	+	1	35
1994 ¹	57	-	4	61	1	1	2	63

1) provisional

Table 3.13.11a.1 Annual nominal landings in tonnes of Baltic salmon in 1972-1994 by area and countries. (S = Sea; C = Coastal; R = River.)

Year	Baltic Main Basin (Sub-divisions 24-29)										
	Denmark	Finland	Germany	Poland	Sweden		USSR		Total		
	S	S + C	S	S	S	R	S	C + R	S	C + R	GT
1972	1,034	122	117	13	277		-	107	1,563	107	1,670
1973	1,107	190	107	17	407	3	-	122	1,828	125	1,953
1974	1,224	282	52	20	403	3	21	155	2,002	158	2,160
1975	1,112	211	67	10	352	3	43	194	1,795	197	1,992
1976	1,372	181	58	7	332	2	84	123	2,034	125	2,159
1977	951	134	77	6	317	3	68	96	1,553	99	1,652
1978	810	191	22	4	252	2	90	48	1,369	50	1,419
1979	854	199	31	4	264	1	167	29	1,519	30	1,549
1980	886	305	40	22	325	1	303	16	1,881	17	1,898

[illegible]

¹Preliminary data.

²Estimated from number of salmon and Lithuanian mean weight per salmon.

³Lithuanian and Russian catch figures are missing in 1994. Estimated from number of salmon and European mink with

Table 3.13.11a.1 (Continued)

Year	Gulf of Finland (Sub-division 32)						Total (Sub-divisions 24-32)		
	Finland			USSR					
	S	S + C	C	S	C + R	S	C + R	GT	GT
1972		138				1,864	298	2,162	
1973		135		-		2,179	425	2,604	
1974		111		-		2,438	493	2,931	
1975		74		-		2,412	596	3,008	
1976	81		-	-	14	2,446	603	3,049	
1977	75		-	-	13	2,085	554	2,639	
1978	68		1	-	6	1,582	454	2,036	
1979	63		3	-	4	1,774	364	2,138	
1980	51		2	-	7	2,126	381	2,507	

Year	Gulf of Finland (Sub-division 32)														(Sub-divisions 24-32) Total			
	Estonia					Finland					Russian Fed.				Total			
	S	C	R	S	C	R	S	C	R	S*	S	C	R	GT	S	C	R	GT
1981	-	2	-	46	1	-	51	3	-	5	54	2,127	437	42	2,606			
1982	-	5	-	91	7	-	91	12	-	-	103	1,718	305	34	2,057			
1983	-	3	-	163	32	-	163	35	-	-	198	2,003	416	38	2,457			
1984	-	5	-	210	42	-	217	47	-	7	264	3,115	483	61	3,659			
1985	-	4	-	219	34	2	239	38	2	20	279	3,571	419	49	4,039			
1986	24	-	-	270	79	2	322	79	2	28	403	3,087	569	52	3,708			
1987	10	-	-	257	61	2	290	61	2	23	353	3,497	448	47	3,992			
1988	19	-	-	122	112	2	156	112	2	15	270	2,590	525	59	3,174			
1989	36	-	-	181	145	2	254	145	2	37	401	3,522	799	75	4,396			
1990	25	-	-	118	369	3	178	369	3	35	573	3,825	1,678	120	5,623			
1991	22	-	-	140	398	3	192	398	3	30	616	3,195	1,426	116	4,739			
1992	6	3	-	77	415	2	111	418	2	28	531	2,775	1,653	111	4,539			
1993 ¹	3	1	1	91	309	3	130	310	4	36 ²	444	2,686	1,142	169	3,937			
1994	3	1	-	88	156	6	91	157	6	-	254	2,268	709	99	3,096			

¹Preliminary data.²Estimated from number of salmon and Finnish mean weight per salmon.³Lithuanian and Russian catch figures are missing in 1994.

(Cont)

Table 3.13.11a.1 (Continued)

Year	Gulf of Bothnia (Sub-divisions 30-31)											Baltic Main Basin and Gulf of Bothnia (Sub-divisions 24-31) Total			
	Finland				Sweden				Total						
	Denmark	S	S + C	C	S	C	R	S	C	R	GT	S	C + R	GT	
1972	11		143		9	126	65	163	126	65	354	1,726	298	2,024	
1973	12		191		13	166	134	216	166	134	516	2,044	425	2,469	
1974	0		310		15	180	155	325	180	155	660	2,327	493	2,820	
1975	98		412		33	272	127	543	272	127	942	2,338	596	2,934	
1976	38	271		155	22	229	80	331	384	80	795	2,365	589	2,954	
1977	60	348		142	49	240	60	457	382	60	899	2,010	541	2,551	
1978	0	127		145	18	212	40	145	357	40	542	1,514	447	1,961	
1979	0	172		121	20	171	35	192	292	35	519	1,711	357	2,068	
1980	0	162		148	23	172	35	185	320	35	540	2,066	372	2,438	

Year	Gulf of Bothnia (Sub-divisions 30-31)										Main Basin and Gulf of Bothnia (Sub-divisions 24-31)				
	Finland			Sweden			Total				S	C	R	GT	
	S	C	R	S	C	R	S	C	R						
1981	125	157	6	26	242	35	151	399	41	591	2,076	434	42	2,552	
1982	131	111	3	-	135	30	131	246	33	410	1,627	293	34	1,954	
1983	176	118	4	-	140	32	176	258	36	470	1,840	381	38	2,259	
1984	401	178	5	-	140	52	401	318	57	776	2,898	436	61	3,395	
1985	247	151	4	-	114	38	247	265	42	554	3,332	381	47	3,760	
1986	124	176	5	11	146	41	235	322	46	603	2,765	490	50	3,305	
1987	66	173	6	8	106	35	74	279	41	394	3,207	387	45	3,639	
1988	74	146	6	1	141	45	75	287	51	413	2,434	413	57	2,904	
1989	225	207	6	10	281	63	235	488	69	792	3,268	654	73	3,995	
1990	597	680	14	12	395	93	609	1,075	107	1,791	3,647	1,309	108	5,073	
1991	580	523	14	1	350	84	581	873	98	1,552	3,003	1,028	114	4,144	
1992	487	746	14	7	386	87	494	1,132	101	1,727	2,664	1,235	109	4,008	
1993 ¹	279	426	16	10	267	83	289	693	99	1,018	2,556	832	105	3,493	
1994	234	249	14	0	178	70	234	427	84	745	2,192	552	93	2,842	

Table 3.13.11a.1 (Continued)

Danish, Finnish, German, Polish and Swedish catches have been converted from gutted to ungutted weight by the factor 1.1. Estonian, Latvian, Lithuanian and Russian Federation catches are reported ungutted.

Sea trout are included in the sea catches in the order of about 3% for Denmark (before 1983), Estonia, Germany, Latvia, Lithuania and Russian Federation, about 5% for Poland and about 10% for Finland.

Based on an inquiry in 1990 non-professional catches in 1990, 1991 and 1992 are included in the Finnish landings from Sub-divisions 29-31 and 32 fixed to an annual quantity of 106 t and 156 t respectively.

Estonia sea catches in Sub-division 32 in 1986-1991 include an inconsiderable quantity of coastal catches.

An estimate of a fishery previously not included in the Hanö Bay area, Sub-division 25, have from 1993 been included in the statistics. These estimates are 7 tonnes, 1,400 individuals coastal catch, 10 tonnes 2,000 individuals sea catch.

Table 3.13.12.1 Annual nominal landings (tonnes) of SEA TROUT in the Baltic.

Year	Baltic Main Basin										Gulf of Bothnia						Gulf of Finland		Total
	Denmark ^{1,4}		Estonia	Finland ²	Germany ⁴	Latvia	Poland		Sweden ^{4,6}		Finland ²		Sweden ⁶		Estonia	Finland			
	S + C	C	C	C	C	R	S + C	S	C	R	C	R	C	S	C	C	C		
1979	3	-	10	-	-	24	81 ³	-	-	-	3	6	-	-	-	-	73	200	
1980	3	-	11	-	-	26	48 ³	-	-	-	3	87	-	-	-	-	75	253	
1981	6	-	51	-	5	21	45 ³	-	-	-	3	131	-	-	-	2	128	392	
1982	17	-	52	1	13	31	80	-	-	-	3	134	-	-	-	4	140	475	
1983	19	-	50	-	14	25	108	-	-	-	3	134	-	-	-	3	148	504	
1984	29	-	66	-	9	30	155	-	-	-	5	110	-	-	-	2	211	617	
1985	40	-	62	-	9	26	140	-	-	-	13	103	-	-	-	3	203	599	
1986	18	-	53	-	8	49	91	7	9	8	118	-	-	1	2	178	566		
1987	31	-	66	-	2	37	163	6	9	5	123	-	-	1	-	184	653		
1988	28	-	99	-	8	33	137	7	12	7	196	42	37	44	3	287	903		
1989	39	-	156	18	10	35	149	30	17	6	215	37	78	1	3	295	1,089		
1990	48 ³	-	189	21	7	100	388	15	15	10	318	43	71	-	4	334	1,563		
1991	48 ³	1	185	7	6	37	272	26	24	7	349	54	60	-	2	295	1,373		
1992	27 ³	1	173	-	6	60	221	103	26	1	350	48	71	-	8	314	1,402		
1993	59	1	386	14	17	70	202	125	21	2	160	43	47	-	14	704 ⁷	1,869		
1994 ⁵	33 ⁸	2	384	15 ⁸	18	70	152	76	16	3	124	42	32	-	6	642	1,615		

¹ Additional sea trout catches are included in the salmon statistics for Denmark until 1982 (Table 5.6.1).² Finnish landings include about 70 % non-commercial catches in 1979-1992.³ Rainbow trout included.⁴ Sea trout are also caught in the Western Baltic in Sub-divisions 22 and 23 by Denmark, Germany, and Sweden.⁵ Estimated.⁶ Catches reported by professional fishermen.⁷ Finnish landings include about 85 % non-commercial catches in 1993.⁸ ICES Sub-div. 22 and 24.

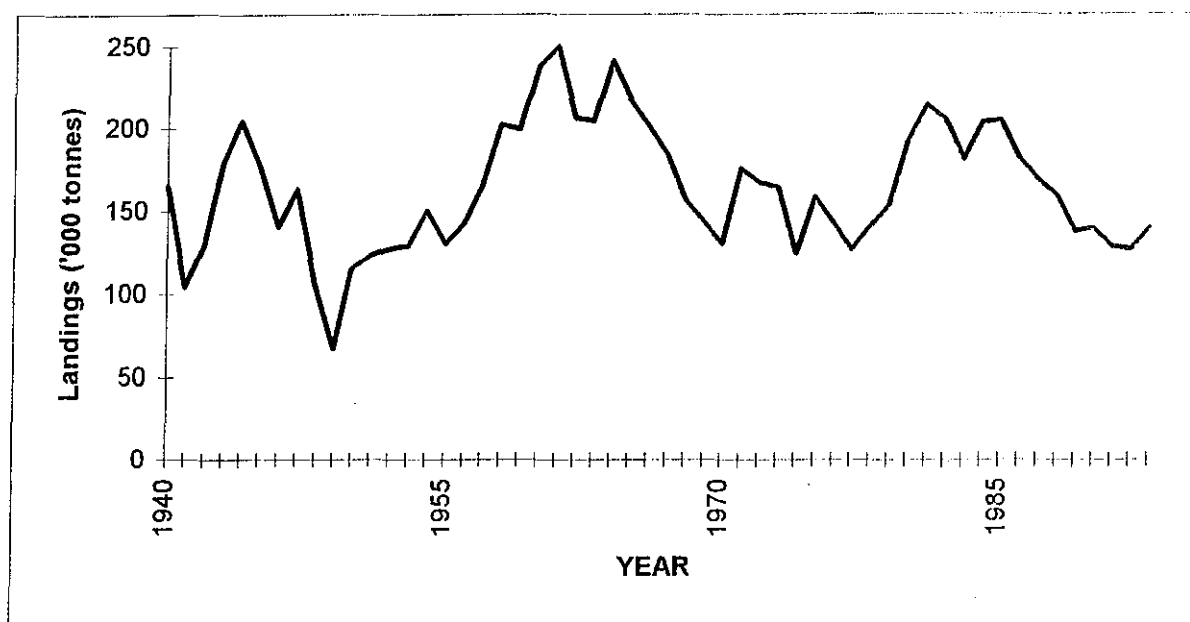


Figure 3.11.7.1 Total landings of sardine in Divisions VIIIc and IXa from 1940-1994.

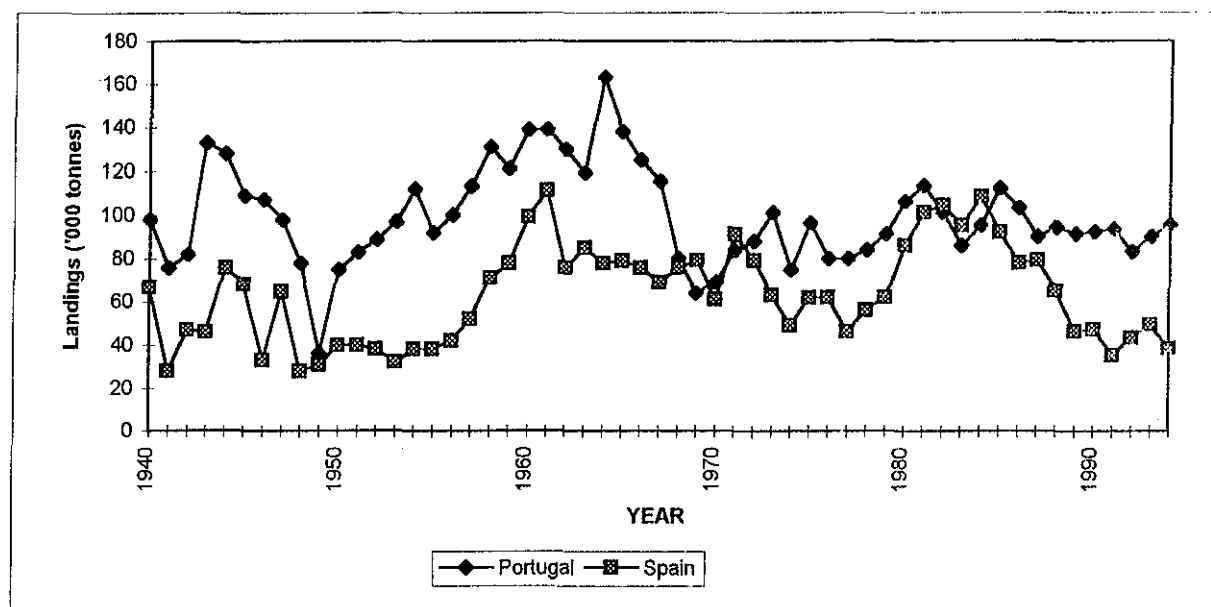
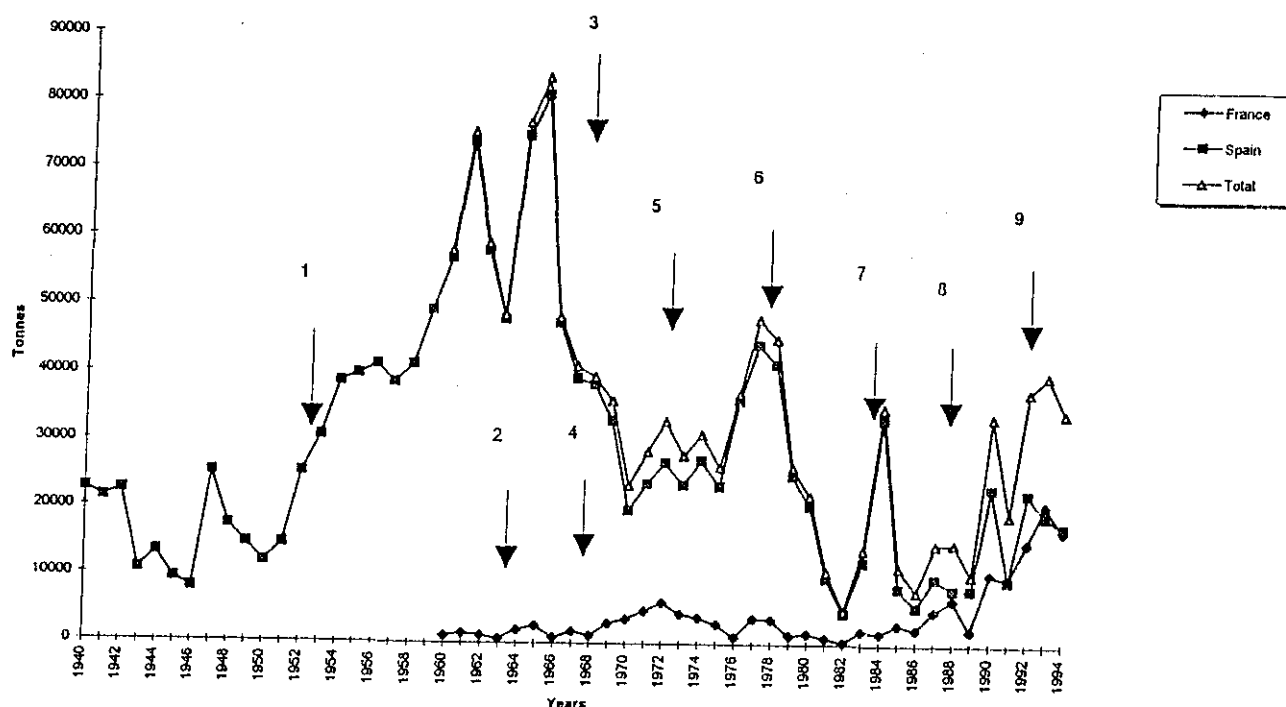


Figure 3.11.7.2 Landings of sardine in Divisions VIIIc and IXa by country during 1940-1994.

Figure 3.11.8.a.1 Bay of Biscay anchovy: historical evolution of the fishery since 1940.



GVACFMWGMHSA06VANE_BISCVFIG101.XLC

- (1) Goniometer
- (2) Echosounder ; anchovy dissapear from the coast of Galicia
- (3) minimum length size : 9cm
- (4) Power block
- (5) 8 tonnes per boat and 5 days per week for the spanish fleet ;
the spanish fleet is not allowed to come into the french 6 nautical miles
- (6) Radar and sonar
- (7) 6 tonnes per boat for the spanish fleet
- (8) Minimum landing size 12 cm ; increase of the french pelagic fleet
- (9) Bilateral agreement between Spain and France : the pelagic fleet is not allowed
to fish anchovy from the end of march to the end of june

Figure 3.12.5.1 Blue Whiting adult distribution.

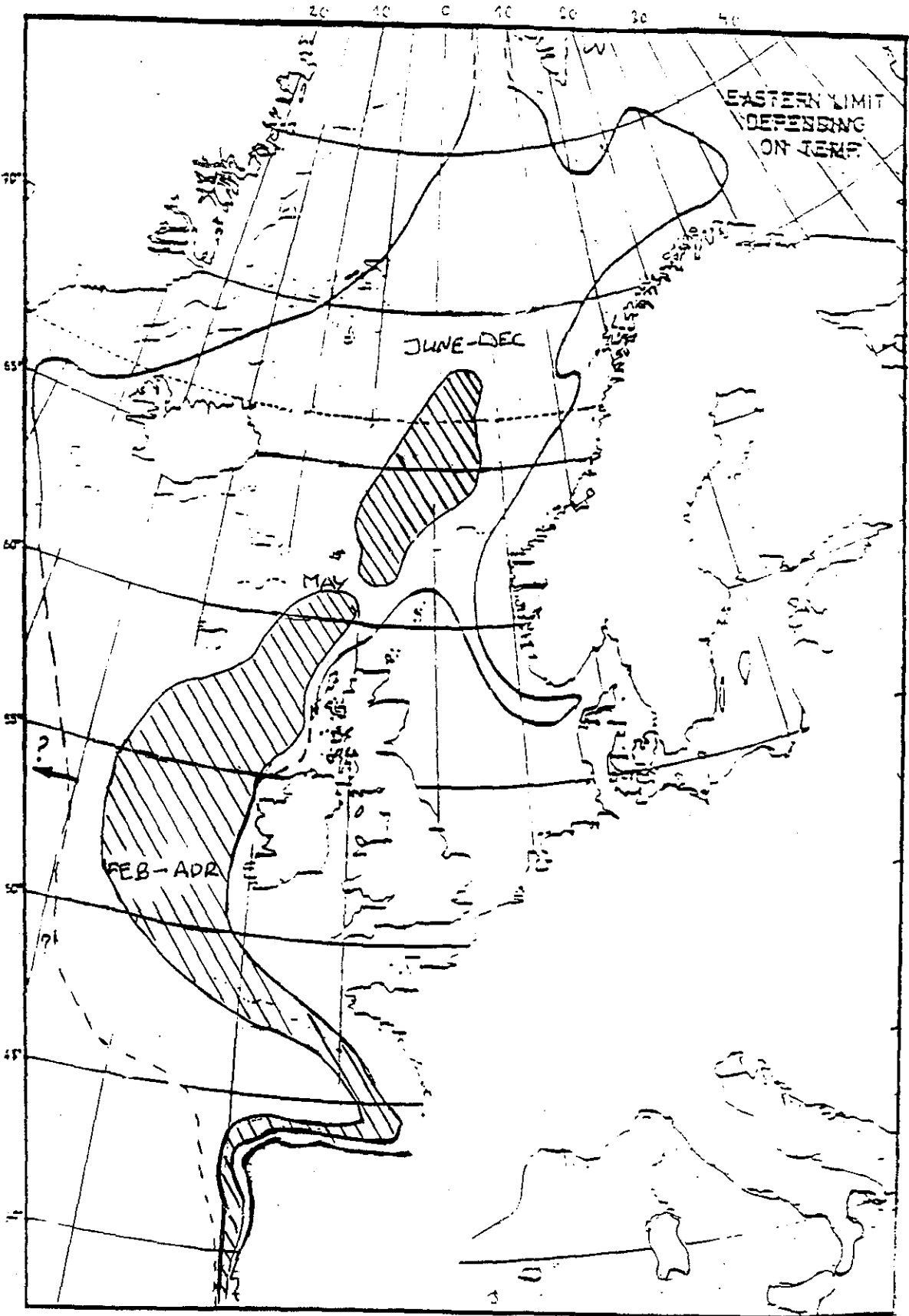


Figure 3.12.5.2 Fishing areas for the various fisheries on the blue whiting stock.

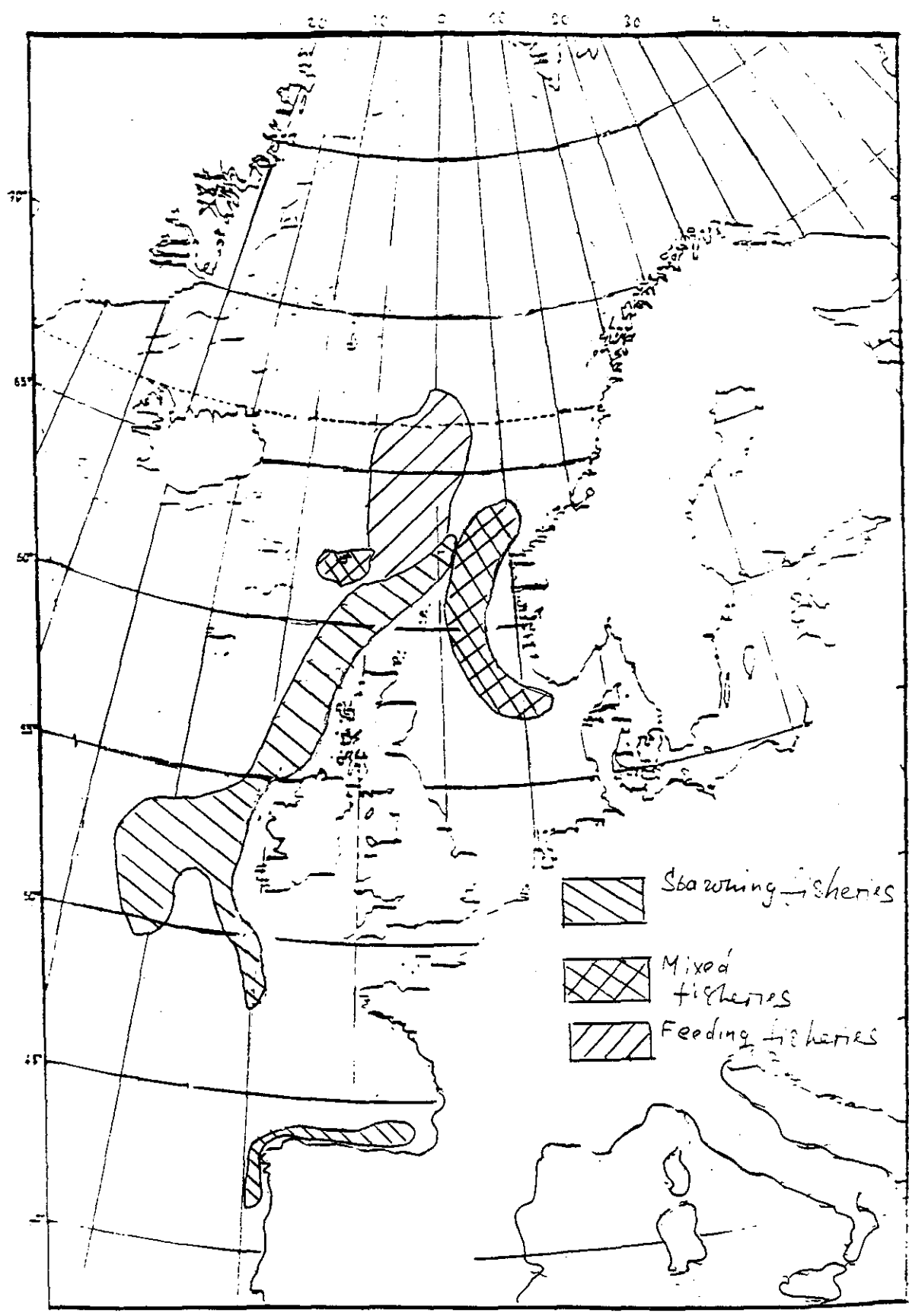
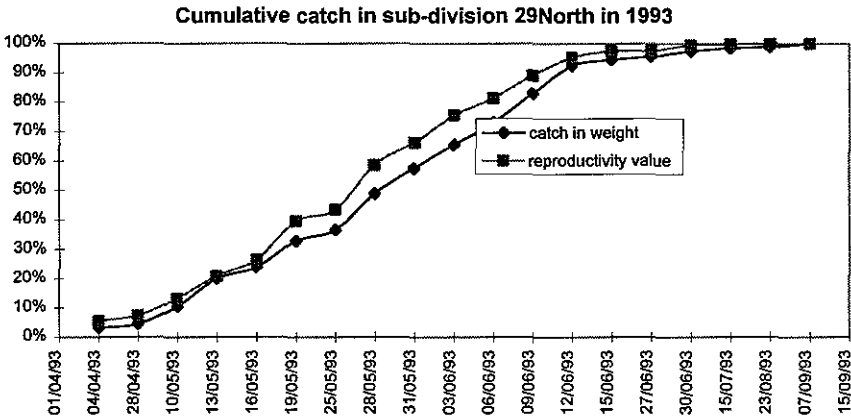
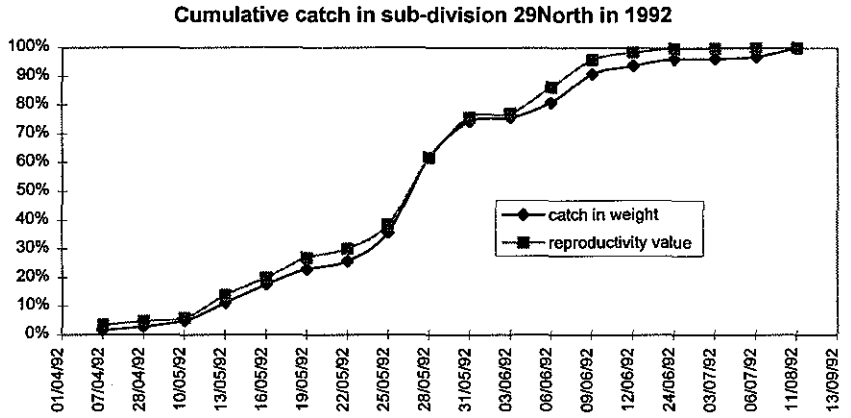
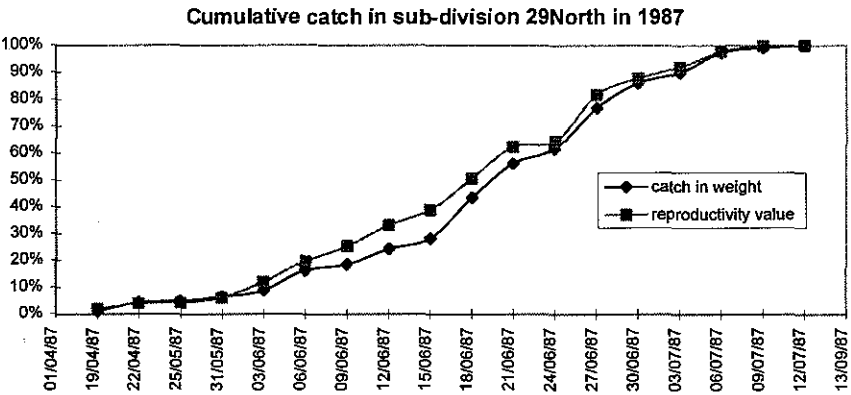


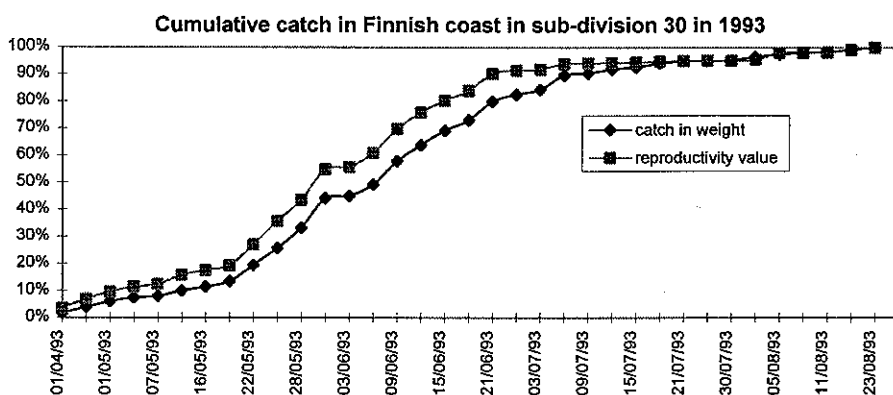
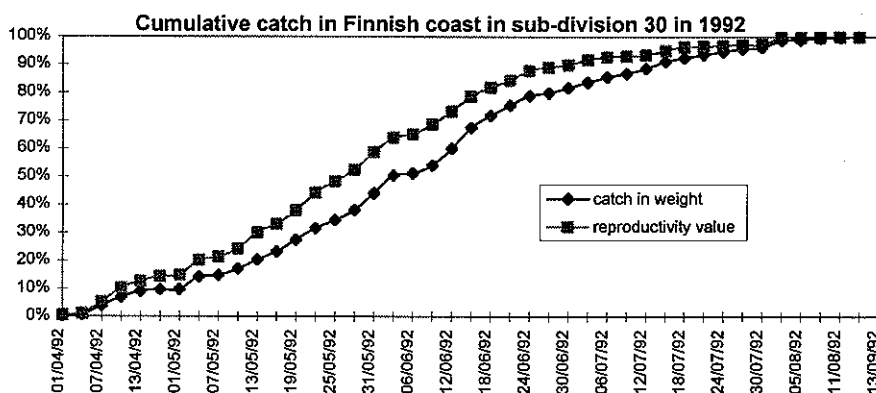
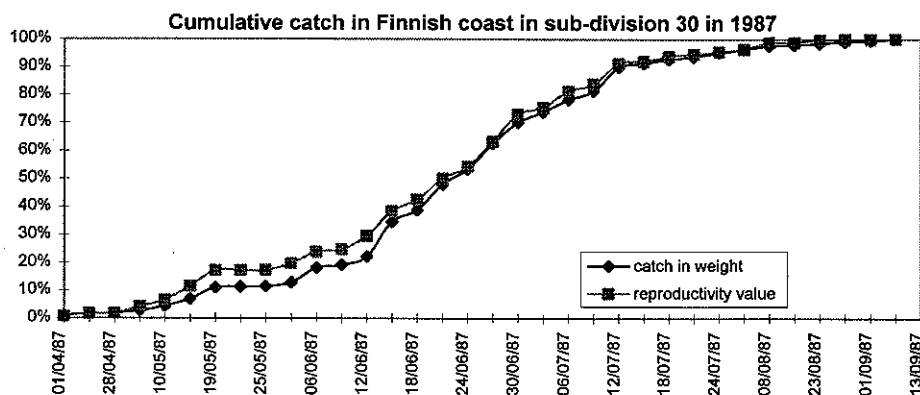
Figure 3.13.11.d Cumulative catch by Sub-division in years 1987, 1992 and 1993. Data based on Swedish-Finnish tagging data.



	% of catch at date				% of reproductivity value at date			
	16.May	28.May	9.June	21.June	16.May	28.May	9.June	21.June
1987	4%	5%	18%	56%	4%	5%	25%	62%
1992	17%	62%	91%	94%	20%	62%	96%	98%
1993	24%	49%	83%	94%	26%	59%	89%	97%

Figure 3.13.11.d Cumulative catch by Sub-division in years 1987, 1992 and 1993. Data based on Swedish-Finnish tagging data.

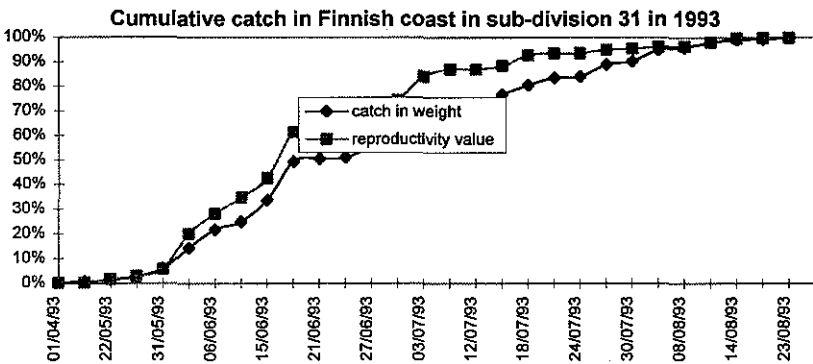
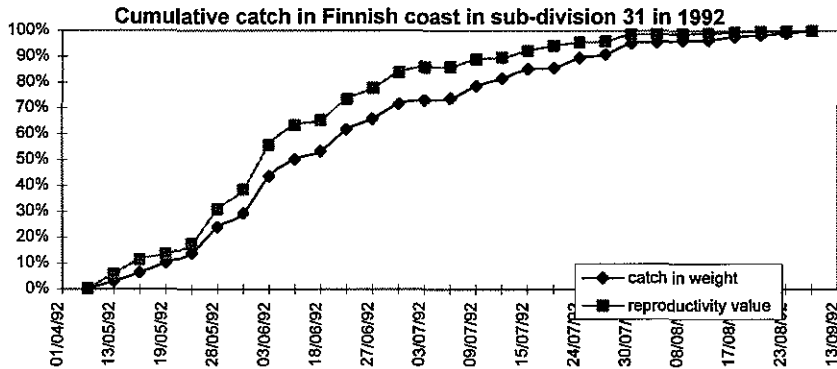
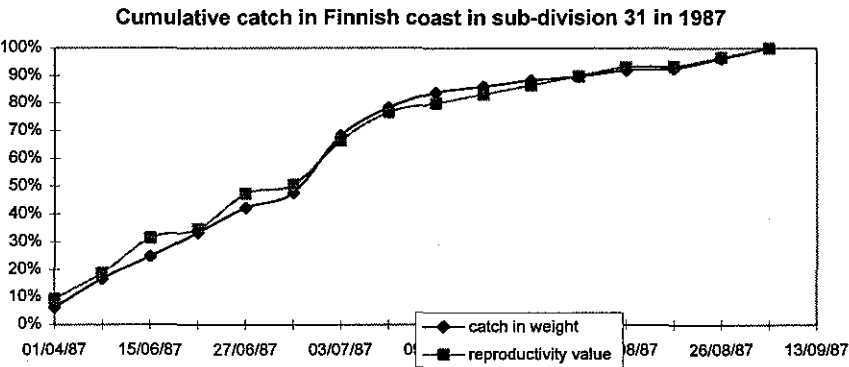
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	% of catch at date				% of reproductivity value at date			
	16.May	28.May	9.June	21.June	16.May	28.May	9.June	21.June
1987	7%	11%	19%	48%	12%	17%	28%	50%
1992	23%	38%	54%	76%	33%	52%	69%	84%
1993	11%	33%	58%	80%	18%	44%	70%	90%

Figure 3.13.11.d Cumulative catch by Sub-division in years 1987, 1992 and 1993. Data based on Swedish-Finnish tagging data.

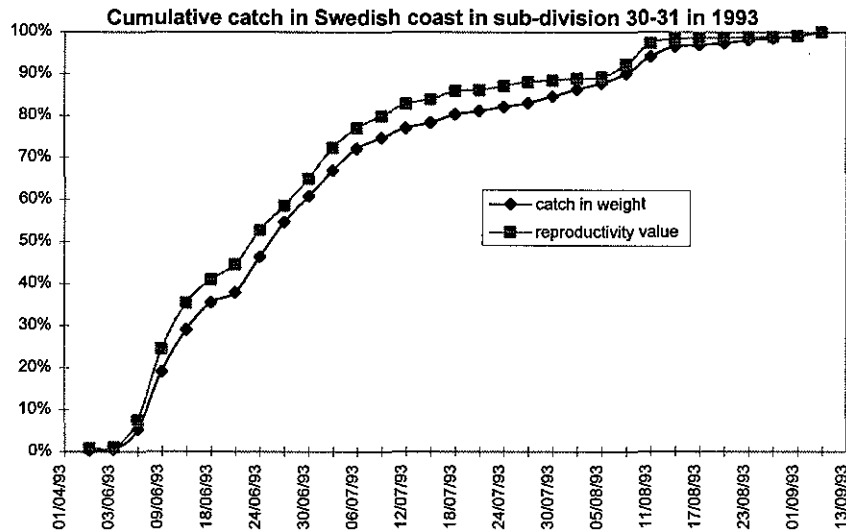
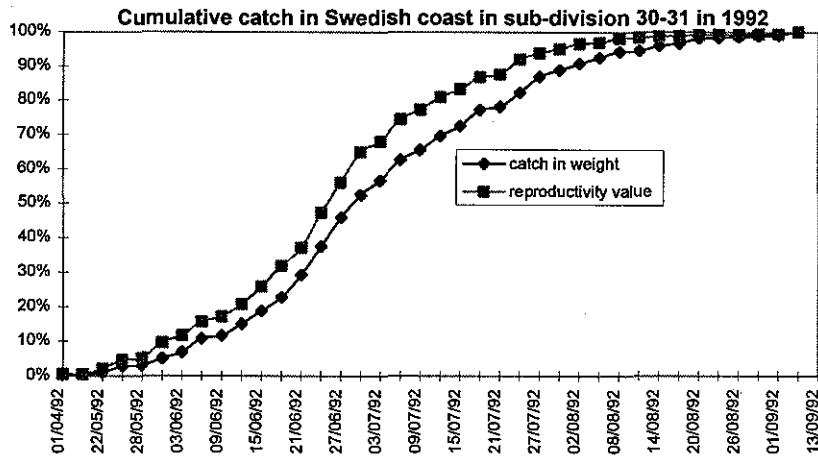
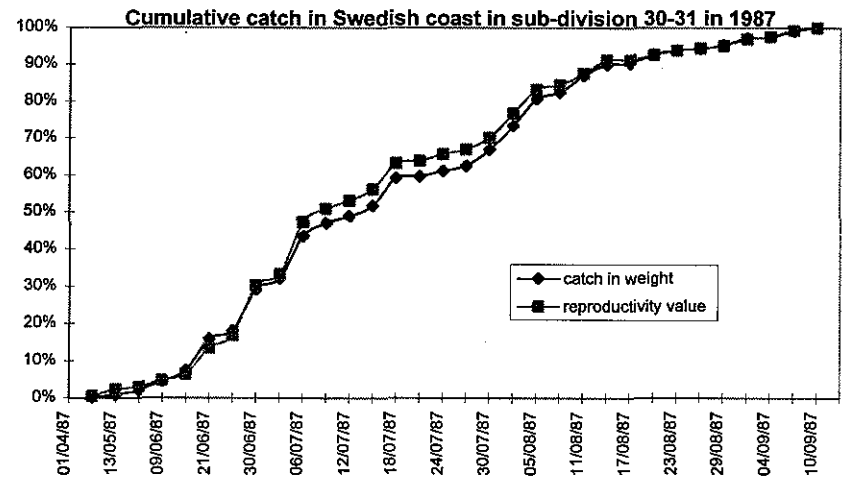
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	% of catch at date				% of reproductivity value at date			
	6.June	21.June	3.July	18.July	6.June	21.June	3.July	18.July
1987	6%	25%	68%	88%	9%	35%	66%	88%
1992	44%	62%	73%	85%	56%	73%	86%	92%
1993	14%	51%	69%	81%	20%	63%	84%	93%

Figure 3.13.11.d Cumulative catch by Sub-division in years 1987, 1992 and 1993. Data based on Swedish-Finnish tagging data.

Continued



	% of catch at date				% of reproductivity value at date			
	6.June	21.June	3.July	18.July	6.June	21.June	3.July	18.July
1987	2%	16%	32%	59%	3%	13%	33%	63%
1992	11%	23%	57%	77%	16%	32%	68%	87%
1993	5%	38%	67%	80%	7%	45%	72%	86%

REPORT TO THE NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION COUNCIL

Source of information: Report of the Working Group on North Atlantic Salmon, April 1995 (ICES Doc. C.M.1995/Assess:14)

Sections 1–6 of this report are set out in the order of the questions from NASCO to ICES (see Section 1.4.3).

1 EVENTS OF THE 1994 FISHERIES AND THE STATUS OF STOCKS BY COMMISSION AREAS

1.1 Overview of catches in the North Atlantic

1.1.1 Nominal catches of salmon in the North Atlantic

Nominal catches of salmon by country in the North Atlantic for 1960–1994 are given in Table 1.1.1 and catches by NASCO Commission Areas for 1989–94 are shown below (in tonnes):

Area	1989	1990	1991	1992	1993	1994
NEAC	4419	3758	2951	3379	3348	3486
NAC	1143	915	713	524	375	354
WGC	338	275	476	242	0	0
Total	5900	4948	4140	4136	3723	3840

Figures for 1994 (3840 t) are provisional and incomplete, but the total is slightly above the 1993 total, which was the lowest recorded since 1960 (Figure 1.1.1). There is some indication that the numbers of fish farm escapees may have declined in 1994, but ranched fish still make up a large proportion of the catch in Iceland. It is clear that some of the decline in catches in recent years can be accounted for by management plans which have reduced fishing effort in several countries

1.1.2 Unreported catches of salmon in the North Atlantic

The total unreported catch within the NASCO Commission areas in 1994 was estimated to be 1276 t, a decrease of 22% compared with 1993 and 33% below the 1989–1993 five-year mean of 1891 t. Estimates for the Commission Areas are given below (in tonnes):

Area	1989	1990	1991	1992	1993	1994
NEAC	2103	1779	1555	1825	1471	1157
NAC	174	111	127	137	161	107
WGC	n/a	n/a	n/a	n/a	12	12
International waters	n/a	180-359	25-100	25-100	25-100	25-100

1.1.3 Production of farmed and ranched salmon in the North Atlantic

The production of farmed salmon in the North Atlantic area in 1994 was 326,785 t. This was the highest production in the history of the farming industry and represented a 22% increase (59,410 t) compared to 1993 (Figure 1.1.2).

Ranching was defined as the production of salmon through smolt releases with the intention of harvesting the total population that return to freshwater (harvesting may include collecting fish for broodstock). The harvest of ranched fish in 1994 was 325 t which was considerably lower than in 1993 (519 t). The great majority (95%) of this production has been in Iceland.

1.2 Fisheries and stocks in the North-East Atlantic Commission (NEAC) Area

1.2.1 Fishing in the Faroes Area

Gear and effort: In accordance with the agreement between the Faroese Salmon Fishermen's Association and the North Atlantic Salmon Fund, commercial fishing for salmon in Faroes territorial waters was suspended for the years 1994 to 1996. A research fishery for salmon continued to operate in the Faroes area in the 1993/94 season, and one research vessel fished a total of 30 sets during 4 trips. The long-line gear used was the same as in previous seasons.

Catch: The total catch in the research fishery in the 1993/94 season was 7 t, and the catch in the 1994 calendar year was 6 t, excluding fish that were tagged and released. The proportion of fish less than 60 cm (that would normally have been discarded) was 14.4%, which is near the upper end of the range observed since the 1982/83 season.

Catch per unit of effort: The CPUE of 43 salmon per 1000 hooks for the 1993/94 season is the third lowest value since the 1981/82 season and was only half the CPUE (84) in the 1992/93 season (Figure 1.2.1).

Biological composition of the catch: In the 1993/94 season 17 % of the fish were of reared origin. This compares with much higher figures in the 1989/90 to 1992/93 seasons (27–44%). Figure 1.2.2 shows the CPUE for past seasons divided into wild fish and farm escapees and suggests that the increase in CPUE in the previous four seasons and the decrease in 1994 was due in part to the numbers of farmed fish in the catch.

Origin of the catch: External tags (ext.) and CWTs were recovered from countries regularly represented in the tag recovery programmes in the past, namely: Ireland (10 CWT), Norway (6 CWT and 30 ext.), Sweden (3 ext.), UK (England and Wales) (1 CWT), Iceland (1 CWT) and Spain (1 CWT). As in the past, the highest recapture rates were

from releases in Norway and Sweden; recaptures rates from other areas are low.

In the 1992/93 to 1994/95 fishing seasons, a total of about 5,300 salmon caught on long-line have been tagged and released in the open sea north of the Faroes. After two fishing seasons (i.e., 1993 and 1994) 66 tagged fish have been reported recaptured in 10 countries as shown below.

Country	Recaptures	
	Total to date	%
Norway	37	56.1
Scotland	9	13.6
Ireland	5	7.6
Russia	5	7.6
Sweden	4	6.1
Denmark	2	3.0
England	1	1.5
Iceland	1	1.5
Spain	1	1.5
Canada	1	1.5
Total	66	100

These preliminary results confirm earlier information that the majority of salmon in the Faroese area originate from Norway. Between 17% and 33% of the tagged fish were assumed to be of farmed origin, and the recapture rate for these fish has been lower than for wild fish.

Exploitation rates at Faroes: The exploitation rate on all monitored stocks in the Faroes fishery in 1993/94 was very low. The highest level (3%) was recorded on 2SW hatchery fish from the R. Imsa, Norway.

1.2.2 Homewater fisheries in the NEAC Area

Gear and effort: There has been a continuation in the general trend to reduce commercial fishing effort in the NEAC area, reflecting conservation measures in the respective countries as well as the reduced value of commercially caught salmon. Reduction in commercial fishing effort in 1994 was reported for salmon fisheries in France, Ireland, Russia, Sweden, UK (England and Wales) and UK (N. Ireland). Minor changes were reported for Finland, Norway and UK (Scotland), but there was an extension of the sport fishing period in Iceland.

Catch: Catches in 1994 were reported to be close to or better than the mean of the last five years in France, Ireland, UK (England and Wales), UK(N. Ireland) and UK(Scotland). Norway and Russia reported catches similar to the previous year, but Iceland, Finland (Teno R.) and Sweden had considerably lower catches than in 1993.

CPUE: Catch per unit effort in general followed the same pattern. In Ireland and parts of UK, catches of 1SW salmon were very good at the beginning of the season but declined suddenly before the end of the season.

Composition of catch: There was an increase in the proportion of 1SW salmon in catches in Ireland, Norway and Russia compared to the previous year. Finland (Teno R.) and Sweden reported similar grilse ratios but France and, in particular, Iceland reported considerable reductions in grilse abundance. No significant trends were reported for MSW salmon.

Origin of catch: Ranched fish continue to comprise the majority of the Icelandic catch and some straying occurs into rivers. There has been a reduction in the frequency of fish farm escapees in Norwegian coastal waters and rivers. Fish farm escapees are also observed at variable levels in coastal and in-river fisheries in Scotland and in low proportions in Ireland and UK (N.Ireland).

Exploitation rates: Considerable reductions of exploitation rates in commercial nets were reported for Russia but exploitation rates in other countries appeared similar to previous years.

1.2.3 Status of stocks in the NEAC Area

There are data from monitored rivers since the early 1980s. The general trends in these rivers suggest that there has been no significant change in smolt production in the NEAC area over that period. Adult runs in western European rivers appear to be remaining stable or increasing, probably due to reduced exploitation in recent years.

A general downward trend in marine survival was noted for wild and hatchery, 1SW and 2SW stocks over the past 11 years, but this trend is not evident in the most recent 6 years. In contrast, survival to freshwater for 1SW wild fish tended to increase over both time periods, which would suggest that reductions in homewater exploitation in recent years have resulted in improved survival to the rivers, despite poor marine survival in this period.

Provisional spawning targets were provided for 6 rivers in the NEAC area. Of the four rivers for which 10 year time series of target attainment data were provided, two had achieved their egg deposition targets in at least 80% of years and two had failed to meet their targets in at least 80% of years. The remaining two rivers had failed to exceed egg deposition targets in the years for which data were provided (one and three years respectively).

1.2.4 Data Deficiencies and Research Needs for the NEAC Area

ACFM supports the continuation of the research fishing programme in the Faroes area and recognises that the results from the project will improve the possibility of developing reliable assessment models in the North-East Atlantic.

Historical scale data from the Faroes fishery should be analysed to assess geographical and temporal variation in

smolt age composition of wild salmon which may reflect differences in the stock composition of catches. The results should be compared with historical data on tag recoveries in the Faroese fishery area, to determine whether stock composition estimates by both approaches concur.

The composition by country of origin of national salmon catches in the NEAC area should be determined from best available data for the four years 1991-94 combined, as a basis for future comparison.

Work should be carried out to refine the estimates of pre-fishery abundance for the North-East Atlantic stocks and to analyse the variability of the estimates. Where possible, separate data sets should be provided for different parts of each country and fishing effort data should be examined to improve estimates of changes in exploitation rates.

Spawning targets based on best available information should be established for all rivers in the NEAC area as soon as possible.

1.3 Fisheries and stocks in the North American Commission (NAC) Area

1.3.1 Fisheries in the NAC Area

Canada

Gear and effort: The moratorium on the commercial fishery in Newfoundland continued in 1994. Quotas were reduced in the remaining commercial fisheries in Labrador and Quebec. Seasonal bag limits in the recreational fishery in both Newfoundland and Labrador were reduced and the seasonal bag limit within Newfoundland was further subdivided into two seasons, before and after July 31. Rivers in several fishing areas were closed to angling for part of, or the entire, season as a result of low stock abundance or low water and high water temperatures. There was no change in gear used in Canada.

Catch: The total salmon landings for Canada in 1994 were 351 t, which was the lowest recorded landing since 1960 (Table 1.1.1). The landings of small and large salmon were 41 % and 54 % of the previous 5 year averages respectively. The decline in commercial catches from 1593 t in 1987 to 141 t in 1994 is a result of the closure of fisheries in Salmon Fishing Areas (SFA) 3-14A in 1992, a reduction in quotas and the general decline in population size. The 1994 recreational catch was the third lowest since 1974, just over 71,000 fish. Recreational catches of small salmon were generally above ten year averages in Labrador, Quebec and north-east Newfoundland and lower in almost all other areas. Recreational catches of large salmon were above the previous ten year averages in Labrador, Quebec (Q1-Q3) and western Newfoundland (SFA 12-14) but were among the lowest recorded in all the other areas of eastern Canada.

Composition and origin of catch: No tagged salmon of USA origin were caught in Canada in 1994. Fish farm escapees were detected primarily in rivers in the Bay of Fundy (SFA 23) where the majority of the aquaculture industry is located.

USA

Gear and effort: The only fishing directed at Atlantic sea-run salmon is by angling in the State of Maine; there were no changes in gear used in 1994. This fishery was further reduced in 1994 by restricting the season bag limit to one small (<64 cm) salmon per year per angler. There was a 31% decrease in licence sales (from 2,656 to 1,821) from the previous year.

Catch: The recreational harvest was the lowest recorded, 13 fish; an additional 249 fish were caught and released mainly in the Penobscot River. Exploitation rates for 1SW salmon in Maine were less than 1%.

France (Islands of St. Pierre and Miquelon)

The catch of salmon for the islands of St. Pierre and Miquelon in 1994 was 2.7 t by 26 professional fishermen, an increase of 50% over that reported for 1993. An additional 1-2 t was harvested by recreational gill-net fishermen.

1.3.2 Status of stocks in the NAC Area

Returns of small and large salmon to rivers of eastern North America in 1994 were among the lowest observed in the last five years. In the more southern areas, returns to some rivers were among the lowest in the last eleven years, while returns in a few were the best in this period.

Despite increased stocking of hatchery-reared salmon in USA during recent years, the numbers of salmon returning to most USA rivers continued to decline in 1994. Returns of MSW salmon were 37% below those documented in 1993 and 62% below the ten year mean.

Egg depositions exceeded or equalled the specific river targets in only 19 of 66 rivers assessed in 1994 in Canada and USA. Large deficiencies in egg depositions were noted in the Bay of Fundy, the Atlantic coast of Nova Scotia and throughout the USA (Table 1.3.1). When estimates of 2SW spawners only are compared to target levels, the status of stocks is of greatest concern in the USA, Scotia-Fundy area (SFAs 19-23) and Labrador (SFA 1-2). Marine survival of smolts of both hatchery and wild origin continued to decline in many monitored rivers, even though improved survival had been expected in recent years as a result of reduced marine fisheries.

1.3.3 Data deficiencies and research needs in the NAC Area

ACFM recommended that further efforts be made to refine the spawning target estimates. Improvements are needed in the estimation of suitable habitat, the appropriateness of the habitat-specific egg targets, and in the determination of the desired sea-age composition of spawners.

The results of monitoring of smolt production and survival from numerous rivers has been useful to ACFM in the determination of appropriate spawner targets. There are, however, some areas for which smolt production estimates are not available (e.g. Labrador) and, for areas where there are estimates, they are usually for small rivers or hatchery stocks. It would be useful to expand the enumeration of smolts to other areas and larger rivers.

The relationship between air temperature at the time of smolt migration from the Conne River and their subsequent survival was presented to ACFM. Further research into mechanisms accounting for the relationship between environmental and biological characteristics would be useful.

1.4 Fisheries and stocks in the West Greenland Commission (WGC) Area

1.4.1 Fishery in WGC Area

Gear and effort: In accordance with the agreement between the Organisation of Hunters and Fishermen in Greenland and the North Atlantic Salmon Fund, all commercial fishing for salmon in Greenland territorial waters was suspended for the years 1993 and 1994.

Catch: The agreement allows for a small subsistence harvest of 12 t each year, representing some 4000 fish. No information is available on the size of the 1994 catch or its composition.

Exploitation rates: The time series of the extant exploitation rates on the North American 2SW Stock complex is presented in Figure 1.4.1. Exploitation varied between 20 and 50% until the 1992 fishing season, but, with the dramatic reduction of fishing pressure in both Canada and Greenland in 1993, exploitation on the stock complex has declined to less than 5%.

1.4.2 Status of stocks in the WGC area

The salmon caught in the West Greenland area are non-maturing 1SW salmon or older, all of which would return to homewaters in Europe or North America as MSW fish if they survived. The most abundant European stocks in West Greenland are thought to originate from the UK and Ireland. The MSW component of most of these stocks has declined in recent years (see Section 1.2). Similar declines in abundance have been noted in many North American

stocks that contribute to the West Greenland fishery (see Section 1.3). Thus the overall status of the stocks and stock components contributing to the West Greenland fishery remains poor.

1.4.3 Data deficiencies and research needs in the WGC Area

The mean weights, sea ages, and proportion of the fish originating from North America and Europe are essential parameters used by ACFM to provide catch advice for the West Greenland fishery. As these parameters are known to vary over time and the latest sampling was conducted in 1992, ACFM recommends that a research survey be carried out.

2 EVALUATION OF EFFECTS OF MANAGEMENT MEASURES

2.1 Quota management measures and closures implemented in Canadian salmon fisheries

The closure of the commercial fisheries in SFAs 15-23 and Q1-Q3 in 1984 resulted in a noticeable increase in returns of small and large salmon to the rivers. The effect of this reduced marine exploitation and the reduced in-river mortality, which resulted from the mandatory hook and release of large salmon in the recreational fishery in many areas of eastern Canada, has been increased egg depositions in many rivers and increased juvenile abundance. However, in some areas, such as the Bay of Fundy, the increased escapement has not been sustained; returns to these rivers are now lower than they were prior to 1984.

The commercial fishery moratorium which has been in operation in Newfoundland since 1992 has mainly benefited the escapement into rivers of Newfoundland and Labrador, except in SFAs 11 to 13 where stocks are either early running and/or the exploitation has already been reduced by the delayed opening of the commercial seasons in 1978 and 1984. Generally, the proportion of large salmon in the returns to the rivers during the moratorium years was higher than in the period 1986 to 1991. While returns of large salmon showed an overall improvement in the last three years, higher returns had been observed at several monitoring facilities in years prior to the moratorium. Had the moratorium not been in effect, severe over-exploitation of many Atlantic salmon stocks would have occurred in 1994.

The effect of the management measures taken in coastal waters of insular Newfoundland after 1991 was evaluated by estimating the numbers of salmon that returned to rivers as a result of the management measures. These estimates are summarised below:

Year	Angling catch (,000)	Total returns (,000)	Increase in returns	
			Small salmon (,000)	Large salmon (,000)
1992	37	140-280	62-123	12-24
1993	43	149-300	71-142	5-11
1994	31	112-223	62-104	6-11

In general, there was a significant increase in counts of small and large salmon at fishways and counting facilities in Newfoundland in the years since the moratorium compared to the period just prior to it (1986-91), but this was not evident for Southern rivers. While returns of large salmon showed an overall improvement in 1992-94 compared to the 1986-91 mean, for several Northern, Eastern and Southern counting facilities, there were pre-moratorium years when returns were higher. Numbers of large salmon released by anglers in SFAs 12, 13, and 14A during the moratorium years showed a marked increase over the means overall but they were still comparable to catches in the late 1970s and early 1980s. For most Northern and Eastern counting facilities, the proportion of large salmon in all three years of the moratorium were higher than the 1984-1989 and 1986-91 means. This was also the case for three out of five Southern counting facilities.

Smolt to adult survival rates for the Western Arm Brook, Newfoundland, increased from 1.5 to 3.0% in pre-moratorium years to 3.6 to 7.0% in post-moratorium years.

The effects of the management changes in Labrador (SFAs 1, 2, & 14B) may be seen in the increased proportion of large salmon in counts at Sandhill River (SFA 2) from an average of 7% in 1970-73 to 26% in 1994. The proportion of the total production returning to freshwater increased from 64% to 90% for small salmon and from 8% to 75% for large salmon. Since the quotas in Labrador were not attained, this measure did not result in any increase in returns to rivers. However, the reduction in licensed effort in 1992 should have reduced commercial exploitation on Labrador salmon stocks.

The closure of the fishery in zones Q7 and Q8 in 1994 may have resulted in 29 to 43 small salmon and 713 to 905 large salmon not being caught assuming that the exploitation rates in 1994 would have been the same as in 1990-92 and there had been no management change.

There has been a marked increase in the proportion of 2SW salmon surviving to spawn for a second time on the Miramichi River. The survival increased from 0-7% prior to 1984 to 5-15% when hook and release regulations were introduced into the recreational fisheries and when coastal commercial fisheries in the Maritimes were closed. It increased to more than 30% when exploitation in Newfoundland and Labrador was reduced as a result of the quota restrictions of 1990 and 1991 and as a result of the commercial salmon moratorium of 1992.

Although the Newfoundland and Labrador commercial salmon fisheries used to harvest small and large salmon originating in Nova Scotia, New Brunswick, Québec, and USA, the benefits in returns to these provinces cannot be quantified.

The moratoria on the commercial cod fishery in Canada in 1992-94 will have reduced the by-catch of salmon.

2.2 Suspension of commercial fishing activity at Faroes

Assuming that monitored stocks have been relatively stable over the past five years, the suspension of commercial fishing should have reduced exploitation at Faroes to less than 10% of levels in the previous three seasons. In practice, the mean levels of exploitation on 2SW fish from R. Imsa (Norway) (hatchery and wild fish) and R. Lagan (Sweden) (hatchery fish) decreased from 18% in the 1988/89 to 1990/91 seasons to 5% in the 1991/92 to 1993/94 seasons. In most years the level of exploitation on 1SW fish from Scandinavia and 1SW and 2SW fish from UK and Ireland have been very low and the effects of the buy-out are therefore difficult to detect.

The estimated reduction in returns to all homewaters that might have been expected if the full Faroese quota had been taken in the 1991/92 to 1993/94 seasons (550 t each season) were as follows

Age/origin	Estimated reduction in returns if quota had been taken.	
	1993	1994
Wild 1SW	9,000	19,000
Wild 2SW	48,000	77,000
Wild 2SW+	39,000	40,000

The analysis also suggests that the fishery would have caught an extra 126,000 fish of farm origin if the full quota had been taken in each season.

The expected increase in total returns to all homewaters and to stocks in Scandinavia, Finland and Russia in 1993 and 1994 resulting from the reduction in the Faroese catches in the 1991/92 to 1993/94 seasons compared with the period 1988/89 to 1990/91 were as follows:

		Increase in total returns	Estimated increase in stocks in Scandinavia, Finland and Russia	
1993	1SW	4,000	2,400-3,200	<1%
	MSW	67,000	40,200-53,600	5% - 12%
1994	1SW	3,000	1,800-2,400	<1%
	MSW	49,000	29,400-39,200	4% - 11%

In addition 126,000 fish of farm origin are estimated to have been taken in the three years, but it is not known how many of these would have returned to homewaters.

The increase in the catches of wild fish is within the annual variation of catches in these countries and does not represent a statistically significant increase. There were no significant changes in the catches for Ireland, Scotland (large salmon) and Russia (2SW salmon) in 1992-1994 compared with those in 1987-1991.

2.3 Suspension of commercial fishing activity at West Greenland

The expected increase in returns of 2SW salmon to homewaters in North America and Europe in 1994 and 1995 as a result of the 213 t West Greenland quota not being taken in 1993 and the 157 t quota in 1994 were as follows:

Continent	Expected Increase in numbers returning to homewaters	
	1994	1995
North America	35,000	26,000
Europe	30,000	22,000

The expected increases in 1994 represent about 20 to 40% of the estimated total 2SW returns in North America and about 3 to 7% of the returns to southern European countries (UK, Ireland and France).

3 MANAGEMENT ADVICE FOR THE WEST GREENLAND AND NORTH AMERICAN COMMISSION AREAS

3.1 Provide catch options, with an assessment of risks, related to the management objective of achieving target spawning escapement

Background

To provide advice on management of the stock at West Greenland the size of the stock was assessed by estimating pre-fishery abundance using the run reconstruction model developed for this purpose. This could only be done in the year following the fishery when the fish returned to North America as 2 SW fish.

A relationship was found between pre-fishery abundance and an index of the area suitable for salmon over the winter period based on sea surface temperature. The temperature data are available annually before the fishery so that it became possible to predict pre-fishery abundance.

ACFM is concerned that the underlying biological or environmental rationale for the relationship on which the prediction is based is not understood.

Pre-fishery abundance forecast:

The databases for the North American run-reconstruction model were updated. The mid-point of the pre-fishery abundance estimate for 1993 was 150,470, which is the lowest value in the 20 year time series (Figure 3.1.1). The results show a continuing downward trend in pre-fishery abundance for North American MSW stocks.

A number of new approaches for improving the predictions of pre-fishery abundance were considered. Although evidence was provided that suggested that grilse abundance or grilse size might be related to MSW stock abundance, no unbiased measures of these parameters were available for North American stocks for the full time series because of the various fishery closures and reductions in effort.

A summed thermal habitat index for January, February, and March (winter) proved to be better correlated with the abundance data than the March habitat data alone and it was therefore used in the assessment. This index had the advantage of broadening the basis for the predictive relationship and may be less subject to small variations in the monthly habitat data.

An unbiased prediction of pre-fishery abundance and its residuals is presented in Table 3.1.1 and Figure 3.1.2. The predicted values are shown to fit the observed data quite well except during periods of low abundance in 1978 and in the late 1980s and 90s (Figure 3.1.3). The probability that the 1995 forecast was less than a particular level was estimated and is shown in the table below:

Probability %	1995 Forecast
25	154,000
30	175,000
35	193,000
40	211,000
45	229,000
50	244,000
55	262,000
60	280,000
65	298,000
70	316,000
75	337,000

The forecast estimate of pre-fishery abundance for 1995 using this model is about 244,000 at the 50% probability level. ACFM is concerned that all of the predicted pre-fishery abundance estimates since 1988 have been well above the observed values (see negative residuals in Figure 3.1.2) with an average difference of 101,000 fish. If this trend continues the actual pre-fishery abundance could be considerably lower than the 244,000 abundance forecast for 1995.

Development of catch options for 1995

The procedure for calculating the quota for the West Greenland fishery is summarised in Appendix 1. In addition to the estimate of pre-fishery abundance, this computation requires an estimate of the stock composition by continent [PropNA], mean weights of North American and European 1SW salmon [WT1SWNA and WT1SWE, respectively], and a correction factor for the expected sea age composition of the total landings [ACF]. The 1993 forecasts of these parameters were used because there are no biological samples for 1993 or 1994 with which to update the parameters.

Parameter	Forecast	Minus 1SE	Plus 1SE
PropNA	0.540	0.477	0.603
WT1SWNA	2.525	2.406	2.643
WT1SWE	2.660	2.510	2.810
ACF	1.121	1.070	1.172

It should be emphasised that these parameters have changed in the past and thus that they should be updated with new data periodically to ensure the greatest possible accuracy in the quota calculation.

In Table 3.1.2, the Greenland quota is computed for a range of probable abundance values and varying proportions of salmon available at West Greenland (Fna).

It should be noted that the 50% probability level only ensures that there is a 50% chance that the spawning escapement in North America will exceed the target level for all rivers combined. Even if this target is achieved (estimated to be a 50% probability) it is likely that some stocks will fail to meet their individual target spawner requirements, while others will exceed their target levels. This may result from random variation between years or from systematic differences in the patterns of exploitation on fish from different rivers or regions. In the latter case, adoption of the 50% probability level may result in some stocks failing to meet their targets over an extended period. This would be likely to result in a long-term decline in those stocks.

It is evident from the indicators of stock status and the extremely low quota levels computed under both previously-used and proposed risk levels, that the North American stock complex is in a tenuous condition. Record low stock levels have been observed despite almost complete closures of mixed and single stock fisheries, a continuing trend of below target spawning escapement for 2SW salmon, and some of the lowest marine survival rates for monitored stocks.

ACFM stresses also that there are a number of difficulties in relying on the prediction model.

- The parameters associated with the West Greenland fishery used in the model have not been estimated since 1992.
- ACFM is concerned that the model has consistently predicted higher pre-fishery abundances than have been observed in the past 6 years. All of the residuals from the prediction have been negative since 1988 as discussed above.

Catch Advice for the WGC and NAC Areas

The pre-fishery abundance of 1SW salmon and the number of 2SW returns to North American rivers is shown in Figure 3.1.4. Pre-fishery abundance is now very close to the observed numbers of 2SW returns. Any fishery on this stock component could therefore have a detrimental effect on the chances of recovery. To protect all the stocks contributing to the fishery **ACFM recommends that mixed stock fisheries should be closed, in 1995 in the West Greenland Commission area and in 1996 in the North American Commission area.**

ACFM also notes that salmon stocks in SFAs 1,2, 19-23 and in the USA appear to be at a very low level and considers that fishing mortality on these stocks from additional sources should be kept as low as possible.

Risk Assessment:

ACFM reviewed a stage-based projection model for North American 2SW salmon stocks and considered how the stochastic projections from this model might be used to provide advice on the assignment of risk associated with various management policies in the West Greenland commission. The model characterises the probability of a population falling to a particular level over a given period and was used to evaluate the effects on the probability of adjusting the 1SW pre-fishery abundance.

This type of approach may provide a basis for risk assessment in the future.

3.2 Review the target spawning level in USA rivers in the light of the present condition of the rivers and the stocks

Determination of the optimal spawning numbers of 2SW salmon in USA rivers is based upon the egg deposition targets derived for Canadian rivers (240 eggs. 100m⁻²) and historical observations of the populations, particularly during periods prior to the initiation of mixed-stock fisheries.

Composite estimates for 2SW spawning targets were developed for salmon rivers in the USA based upon the area of accessible juvenile salmon habitat and biological characteristics of the USA salmon stocks and maiden 2SW salmon. Summary estimates by geographical regions in New England are provided in Table 3.2.1. Estimates for

existing juvenile salmon habitat are based upon available information, while estimates of potential salmon habitat assume that spawners would have access to measured habitat at some time in the future. Estimates of habitat for most of the rivers in the State of Maine are thought to be low because much of the existing information is based upon old or incomplete information: for example, most rivers have fewer dams today; water quality has been markedly improved; and modern technology allows more complete assessment of available habitat.

Spawning targets for all areas under salmon restoration programs in the USA appear reasonable. For those areas of Maine not currently receiving adequate spawning escapement, the potential deficit in 1996 represents 18-26% of the USA 2SW spawner requirements and 3-4% of the total requirement for North America. Although there is a short-term deficit for these rivers, these targets are considered to be achievable in the future. If excess 2SW spawners were achieved in the rivers currently being enhanced, then restoration programs could be initiated and expanded in other Maine rivers where there are spawner deficits.

4 MANAGEMENT ADVICE FOR THE NORTH-EAST ATLANTIC COMMISSION AREA

4.1 Provide estimates of spawning targets for optimal production

Definition of stock targets:

ACFM agreed that spawning targets are best derived from stock and recruitment data. Regardless of the type of model which provides the best fit to the data, the point of maximum gain (MG) and the replacement point (RP) (Figure 4.1.1) can be regarded as reference points which define the lower and upper bounds of target spawning requirement. Somewhere between these limits will lie an optimum which will minimise the risk of recruitment over-fishing while maximising the gain. The lower recruitment reference point (MG) has been adopted by ACFM as an objective standard spawning target. However, this should not be regarded as the target level applicable to management as it takes no account of the risk of the stock falling below target. It therefore equates to the minimum biologically acceptable level (MBAL) for a stock. In order to avoid falling below this point because of variability in recruitment and exploitation rates, a target should be set at some level above the maximum gain (MG) level. The exact location of the target is an issue which should be considered locally by biologists and managers.

For rivers where no clear stock-recruitment relationship can be fitted or where no stock-recruitment data are available, it may still be possible to derive a spawning target following the principles defined by ICES (Report of the Workshop on Salmon Spawning Stock Targets in the North-East Atlantic,

C.M.1994/M:6). Where insufficient stock-recruitment data are available, target spawning levels must be derived using data from other rivers in the same geographic area or with similar environmental characteristics.

Development of spawning targets in the NEAC Area

Some advances in the development of spawning targets in the NEAC area have been made and these have also been used to provide advice on the status of stocks for the first time. However, in order for spawning targets to be used to provide catch advice they will have to be prepared for all stocks in the NEAC area (or all those affected by a particular fishery, if appropriate stock complexes can be defined). **ACFM recommends that all countries should establish preliminary spawning targets for all their rivers as soon as possible.**

4.2 Develop methods which could be used in providing advice on catch quotas in relation to stock abundance and, if possible, provide catch advice

Methods for providing advice on catch options in relation to stock abundance in the NEAC area are likely to depend upon adopting a similar approach to that used for the provision of catch advice for the West Greenland fishery since 1993.

ACFM has pointed out the risks to individual stocks in this approach and noted that the implications have not been fully explored for the management of European stocks, where the patterns of movements of fish between areas and the interaction between fisheries may be more complex than in the North American and West Greenland Commission Areas.

ACFM prepared a preliminary analysis of estimates of the pre-fishery abundance of maturing and non-maturing 1SW salmon in the NEAC area. These were based on the catch in numbers of 1SW and MSW salmon in each country, which were raised to take account of natural mortality and minimum and maximum estimates of non-reported catches, and exploitation rates on the two age classes. It was recognised that this would have to be done for a number of stock complexes.

Figures 4.2.1-4.2.2 show these preliminary estimates for two European stock complexes as defined below:

Southern European stock complex:	Northern European stock complex:
Ireland	Iceland
France	Finland
UK(England & Wales)	Norway
UK(Northern Ireland)	Russia
UK(Scotland)	Sweden

Although there was variation in the estimates of pre-fishery abundance, there was an apparent decline in non-maturing 1SW salmon in both stock complexes.

In the absence of a fully-developed time series of pre-fishery abundance data it was not possible to test any predictive models for total stocks

Catch advice for the NEAC Area:

In view of the apparent decline in the pre-fishery abundance estimates and in the absence of a predictive model, ACFM recommends that levels of exploitation on salmon not maturing at 1SW in both southern and northern European stock complexes in mixed stock fisheries should not be allowed to increase until more detailed assessments are available which show that this will not have an adverse effect on recruitment.

5 RESEARCH DEVELOPMENTS WHICH MIGHT ASSIST NASCO

5.1 The impacts of fish farm escapees and sea-ranched fish on the wild stocks

In its 1994 advice ACFM reported in detail on the likely impacts of fish farm escapees and sea-ranched fish on wild stocks under the following headings: the percentage appearing in the fisheries at Faroes, West Greenland and in homewaters (including rivers), and the genetic, disease, parasite, ecological and environmental impacts of these fish.

No new information was available to ACFM.

5.2 Criteria for identifying recruitment overfishing of Atlantic salmon

This topic was dealt with in the advice given in 1994 and ACFM had no new information.

5.3 Predictive models of annual migration and distribution of Atlantic salmon stock complexes

In its advice in 1994 ACFM described initial trials with an Atlantic salmon migration model intended to explore the part that different known factors play in migration. ACFM had no new information to report.

5.4 Biological and environmental variables affecting salmon abundance

5.4.1 Differences in marine survival between stocks

Icelandic studies of the possibilities of using selective breeding to increase performance and profitability of

salmon ranching show that there is significant variation in return rates between salmon stocks and even more variation between families within stocks. This suggests that the profitability of ranching could be improved by increasing return rates and body weight at return by selective breeding. These results also have implications for the management of wild salmon because they suggest that there could be genetically-based differences in survival rates between stocks.

5.4.2 Post-smolt growth and maturation

Return rates for 1SW and 2SW salmon are significantly higher in the Penobscot than the Connecticut stock. In addition, the fraction of the smolt year class or cohort that matured as 1SW fish was also higher for the Penobscot stock. Image processing techniques were used to study scale characteristics and suggest that systematic differences in growth, survival, and maturation between these two reared stocks may be related to their post-smolt migrations. This in turn suggests that post-smolt growth may play a significant role in deciding the age-at-maturity and survival patterns of Atlantic salmon.

5.4.3 Forage base of Atlantic salmon in North America and Europe

There is a statistical relationship between the distribution of sea surface temperature and the abundance of non-maturing 1SW North American salmon, although the underlying biological causes remain unknown. The transition to marine feeding is recognised as important to post-smolt survival and may contribute to the overall survival of a smolt cohort and thus contribute to the variability in production of the 1SW and 2SW age components of salmon stocks. An investigation of the most important prey items may therefore provide a valuable tool to help in understanding how the sea surface temperature affects salmon stocks.

6 COMPILATION OF TAG RELEASE AND FINCLIP DATA FOR 1994

Data on releases of tagged and finclipped fish in 1994 were compiled as a separate report. In excess of 1.64 million CWTs and 0.46 million external tags were applied to Atlantic salmon released in 1994. In addition, 2.33 million salmon were marked with finclips alone. Thus, more than 4.24 million marked fish were released, 4.05 million of which were hatchery reared. This compares with a total of 3.62 million marked fish released in 1993 and 4.49 million in 1992.

Table 1.1.1 Nominal catch of SALMON by country (in tonnes round fresh weight), 1960-1994. (1994 provisional figures).

Year	Canada				East				West				Sweden				UK				UK				Unreported catches			
	(1)	Den.	Farnes	Finland	France	Gird.	recenlan	Iceland	Ireland	Norway	Russia	Spain	St. P. & M.	(West)	(E & W)	N.Ireland	(4,7)	UK	USA	Other (8)	Total Reported Catch	NASCO Areas	International waters (9)	Total Catch				
1960	1636	-	-	-	-	-	60	100	743	1659	1100	33	-	40	283	139	1443	1	-	-	7237	-	-	-				
1961	1583	-	-	-	-	-	127	127	707	1533	790	20	-	27	232	132	1185	1	-	-	6464	-	-	-				
1962	1719	-	-	-	-	-	244	125	1459	1935	710	23	-	45	318	356	1738	1	-	-	8673	-	-	-				
1963	1861	-	-	-	-	-	466	145	1458	1786	480	28	-	23	325	306	1725	1	-	-	8604	-	-	-				
1964	2069	-	-	-	-	-	1539	135	1617	2147	590	34	-	36	307	377	1907	1	-	-	10759	-	-	-				
1965	2116	-	-	-	-	-	861	133	1457	2000	590	42	-	40	320	281	1593	1	-	-	9434	-	-	-				
1966	2369	-	-	-	-	-	1370	106	1238	1791	570	42	-	36	387	287	1595	1	-	-	9792	-	-	-				
1967	2863	-	-	-	-	-	1601	146	1463	1980	883	43	-	25	420	449	2117	1	-	-	11991	-	-	-				
1968	2111	-	5	-	-	-	1127	162	1413	1514	827	38	-	20	282	312	1578	1	403	9793	-	-	-	-				
1969	2202	-	7	-	-	-	2210	133	1730	1383	360	54	-	22	377	267	1955	1	893	11594	-	-	-	-				
1970	2323	-	12	-	-	-	2146	195	1787	1171	448	45	-	20	527	297	1392	1	922	11286	-	-	-	-				
1971	1992	-	-	-	-	-	2689	204	1639	1207	417	16	-	18	426	234	1421	1	471	10735	-	-	-	-				
1972	1759	-	9	32	34	-	2113	250	1804	1568	462	40	-	18	442	210	1727	1	486	10955	-	-	-	-				
1973	2434	-	28	50	12	-	2341	256	1930	1726	772	24	-	23	450	182	2006	2.7	533	12770	-	-	-	-				
1974	2539	-	20	76	13	-	1917	225	2128	1633	709	16	-	32	383	184	1708	0.9	373	11957	-	-	-	-				
1975	2485	-	28	76	25	-	2030	266	2216	1537	811	27	-	26	447	164	1621	1.7	475	12236	-	-	-	-				
1976	2506	-	40	66	9	<1	1175	225	1561	1530	772	21	2.5	20	208	113	1019	0.8	289	9557	-	-	-	-				
1977	2545	-	40	59	19	6	1420	230	1372	1488	497	19	-	10	345	110	1160	2.4	192	9514	-	-	-	-				
1978	1545	-	37	37	20	8	984	291	1230	1050	476	32	-	10	349	148	1323	4.1	138	7682	-	-	-	-				
1979	1287	-	119	26	10	<1	1395	225	1097	1831	455	29	-	12	261	99	1076	2.5	193	8118	-	-	-	-				
1980	2680	-	536	34	30	<1	1194	249	947	1830	664	47	-	17	360	122	1134	5.5	277	10127	-	-	-	-				
1981	2437	-	1025	44	20	<1	1264	163	685	1656	463	25	-	26	493	101	1233	6	313	9954	-	-	-	-				
1982	1798	-	865	54	20	<1	1077	147	993	1348	354	10	-	25	286	132	1092	6.4	437	8644	-	-	-	-				
1983	1424	-	678	58	16	<1	310	198	1656	1550	507	23	3	28	429	187	1221	1.3	466	8755	-	-	-	-				
1984	1112	-	628	46	25	<1	297	159	829	1623	593	18	3	40	345	78	1013	2.2	101	6912	-	-	-	-				
1985	1133	-	566	49	22	7	864	217	1595	1561	659	13	3	45	361	98	913	2.1	-	8108	-	-	-	-				
1986	1559	-	530	37	28	19	960	310	1730	1598	608	27	2.5	54	430	109	1271	1.9	-	9274	-	-	9274	-				
1987	1784	-	576	49	27	<1	966	222	1239	1385	564	18	2	47	302	56	922	1.2	-	8160	2788	10948	-	-				
1988	1311	-	243	36	32	4	893	396	1874	1076	419	18	2	40	395	114	882	0.9	-	7736	3248	10984	-	-				
1989	1139	-	364	52	14	<1	337	278	1079	905	359	7	2	29	296	142	895	1.4	-	5900	2277	8177	-	-				
1990	911	13	315	60	15	<1	274	426	586	930	315	10	2	33	338	94	624	2.4	-	4948	1890	180-350	6838	-				
1991	711	3.3	95	70	13	4	472	505	404	876	215	15	1	38	200	55	462	0.8	-	4140	1682	25-100	5822	-				
1992	522	10	23	77	20	5	237	635	630	867	166	16	1.3	49	186	91	600	0.7	-	4136	1962	25-100	6098	-				
1993	373	9	21	70	16	-	-	656	543	923	140	14	1.8	56	270	83	547	0.6	-	3723	1644	25-100	5367	-				
1994 (10)	351	6	6	49	18	-	-	448	819	937	138	15	2.7	44	319	91	596	0	-	3840	1276	25-100	5116	-				
Means																												
1989-1993	731	-	164	66	16	5	330	500	648	900	239	12	2	41	258	93	626	1	-	4570	1891	-	-	6461				
1984-1993	1056	-	336	55	21	8	589	380	1051	1174	404	16	2	43	312	92	813	1	-	6304	-	-	-	-				

N means

1989-1993	731	-	164	66	16	5	330	500	648	900	239	12	2	41	258	93	626	1	-	1	-	4570	1891	-	6461
1984-1993	1056	-	336	55	21	8	589	380	1051	1174	404	16	2	43	312	92	813	1	-	1	-	6304	-	-	-

1. Includes estimates of some local sales, and, prior to 1984, by-catch.
2. Includes catches made in the West Greenland area by Norway, Faroes, Denmark.
3. Until 1994, includes only those catches sold through dealers.
4. Catch on River Foyle allocated 50% Ireland and 50% N. Ireland.
5. Before 1966, sea trout and sea charr included (5% of total).
6. Weights estimated from 1994 men weight. Early years may be underestimates.
7. Not including angling catch (mainly ISW).
8. Includes catches in Norwegian Sea by vessels from Denmark, Sweden, Germany, Norway and Finland.
9. Estimates refer to season ending in given year.
10. Includes provisional and incomplete data.

Table 1.3.1 Egg depositions relative to target during 1984 to 1994 for the assessed rivers in eastern Canada.

		Year of spawning of small and large salmon									
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Bay of Fundy / Atlantic Coast of Nova Scotia (% of rivers assessed)											
Number of rivers assessed		2	2	2	2	4	4	4	5	5	13
Depositions as % of target	>=100%	100%	50%	50%	50%	75%	50%	50%	20%	20%	10%
	<50%	0%	0%	0%	0%	0%	25%	0%	40%	60%	90%
Rivers flowing into the Gulf of St. Lawrence (% of rivers assessed)											
Number of rivers assessed		27	27	27	27	26	26	26	29	32	36
Depositions as % of target	>=100%	26%	37%	56%	70%	54%	42%	54%	55%	38%	36%
	<50%	26%	4%	11%	7%	4%	8%	8%	17%	19%	19%
South and Northeast Newfoundland and Labrador (% of rivers assessed)											
Number of rivers assessed		4	5	6	10	11	11	11	11	12	14
Depositions as % of target	>=100%	50%	60%	67%	40%	27%	27%	9%	36%	42%	36%
	<50%	25%	20%	33%	40%	55%	55%	73%	45%	33%	43%

**Table 3.1. 1 Observed and predicted prefishery abundance and residuals
(difference between predicted and observed values).**

Year	Prefishery Abundance Mid-point	Prefishery abundance 01 from Jan+Feb+Mar	
		Unbiased Predicted	Unbiased Residual
1974	689188	562294	126894
1975	795276	505968	289308
1976	706814	533307	173507
1977	566179	609952	-43772
1978	320904	761988	-441084
1979	705962	664701	41261
1980	619221	610182	9039
1981	591253	555599	35654
1982	490695	482746	7949
1983	270166	308158	-37992
1984	291667	201769	89898
1985	467162	240950	226212
1986	499987	469771	30217
1987	460708	412789	47919
1988	367376	474788	-107412
1989	300048	466486	-166438
1990	256106	357093	-100986
1991	277135	300145	-23010
1992	177570	301257	-123687
1993	150470	236110	-85640
1994			
1995			

Table 3.1.2 Quota options (in tonnes) for 1995 at West Greenland based on regression forecasts of fishery abundance. Proportion at West Greenland refers to the fraction of harvestable surplus allocated to the West Greenland fishery. The probability level refers to the pre-fishery abundance levels derived from the probability density function.

Prob. level	Proportion at West Greenland (Fna)										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
25	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0
40	0	2	3	5	6	8	9	11	12	14	15
45	0	11	22	34	45	56	67	78	89	101	112
50	0	19	38	58	77	96	115	135	154	173	192
55	0	29	58	87	116	145	173	202	231	260	289
60	0	39	77	116	154	193	231	270	309	347	386
65	0	48	96	145	193	241	289	338	386	434	482
70	0	58	116	174	232	290	347	405	463	521	579
75	0	69	138	208	277	346	415	484	554	623	692

Sp. res = 208,170
 Prop NA = 0.54
 WT1SWNA = 2.525
 WT1SWE = 2.66
 ACF = 1.121

Table 3.2.1 Estimated Atlantic salmon spawner requirements (2SW) for USA rivers¹

State	River	Units of salmon habitat (100m ²)			*	Required Spawners (2SW)	
		Existing Habitat Units	(%)	Potential Habitat Units		(%)	Existing Potential
Connecticut	Connecticut	145,900	33.3	261,400		35.2	9,727 17,427
Rhode Island	Paucatuck	5,370	1.2	5,370		0.7	367 367
New Hampshire	Merrimack	38,980	8.9	57,065		7.7	2,599 3,804
Maine	Aroostook	60,775	13.9	60,775	*	8.2	4,052 4,052
	Prestile	835	0.2	835	*	0.1	56 56
	Meduxnekeag	5,000	1.1	5,000	*	0.7	333 333
	St. Croix	29,260	6.7	29,260	*	3.9	1,951 1,951
	Boyden Str.	85	0	85	*	0	6 6
	Pennamaquaun	85	0	85	*	0	6 6
	Dennys	2,415	0.6	2,415		0.3	161 161
	Hobart Str.	85	0	85	*	0	6 6
	Orange	20	0	20	*	0	1 1
	East Machias	2,145	0.5	2,145		0.3	143 143
	Machias	6,685	1.5	6,685	*	0.9	446 446
	Chandler	85	0	85	*	0	6 6
	Indian	85	0	85	*	0	6 6
	Pleasant	1,085	0.2	1,085	*	0.1	72 72
	Narraguagus	6,015	1.4	6,015		0.8	401 401
	Tunk Str.	585	0.1	585	*	0.1	39 39
	Union	8,360	1.9	8,360	*	1.1	557 557
	Orland River	165	0	165	*	0	11 11
	Penobscot	102,575	23.4	102,575	*	13.8	6,838 6,838
	Passaga'wa'kg	165	0	165	*	0	11 11
	Little	0	0	0	*	0	0 0
	Ducktrap	585	0.1	585	*	0.1	39 39
	St. George	250	0.1	250	*	0	17 17
	Medomak	0	0	0	*	0	0 0
	Pemaquid River	85	0	85	*	0	6 6
	Sheepscot River	2,845	0.7	2,845		0.4	190 190
	Kennebec River(4)	1,005	0.2	114,300	*	15.4	67 7,620
	Androscoggin River(	3,175	0.7	47,900	*	6.5	212 3,193
	Royal River	420	0.1	420	*	0.1	28 28
	Presumpscot River	85	0	85	*	0	6 6
	Saco River	12,540	2.9	25,080		3.4	836 1,672
	Mousam River	0	0	0	*	0	0 0
	Kennebunk River	85	0	85	*	0	6 6
	Salmon Falls River	0	0	0	*	0	0 0
Total Maine		247,585	56.5	418,145	*	56.3	16,506 27,876
USA	Grand Total	437,835	100	741,980	*	100	29,198 49,474

¹ Based upon: 240 eggs/unit; 7,200 eggs/female; 50-50 sex ratio

* indicates not all habitat has been inventoried and some inventories are outdated/incomplete.

Figure 1.1.1 Nominal catches of salmon in four North Atlantic regions 1960–94.

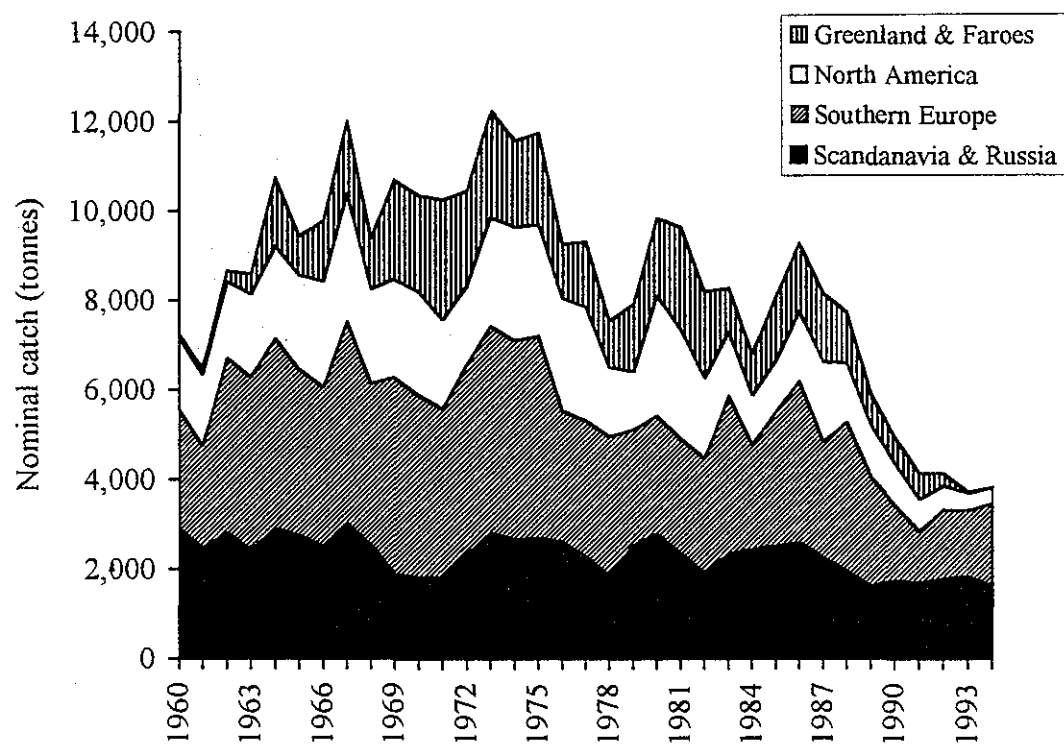


Figure 1.1.2 Production of farmed salmon (tonnes round fresh weight) in the North Atlantic, 1980–1994.

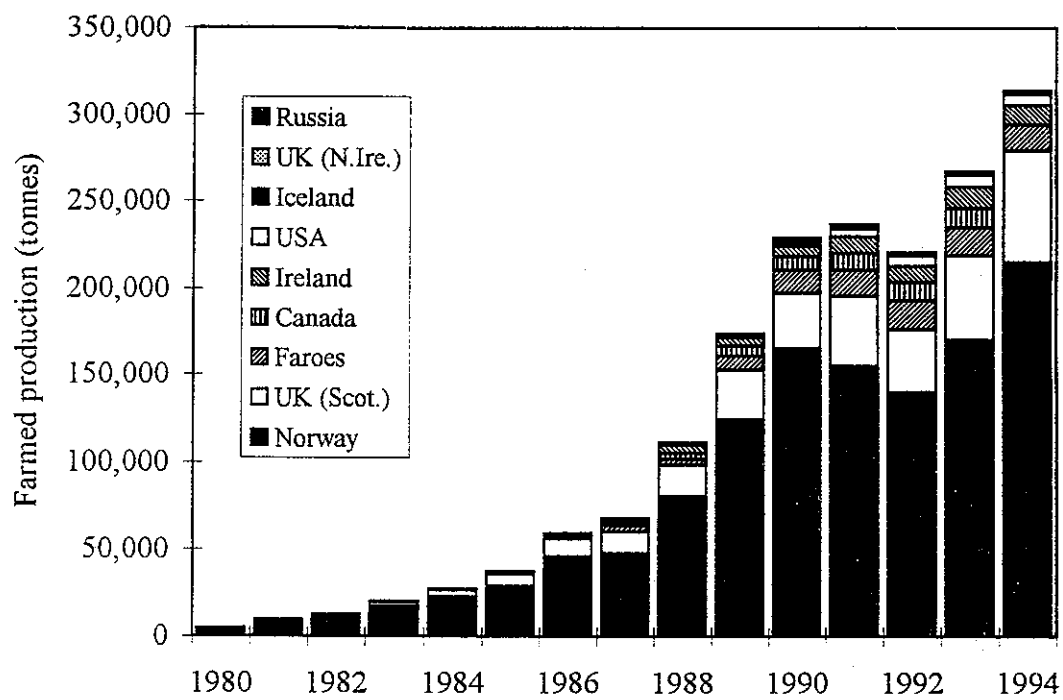


Figure 1.2.1 Catch per unit of effort (1000 hooks) inside the Faroes EEZ for the fishing seasons 1981/1982 to 1993/1994

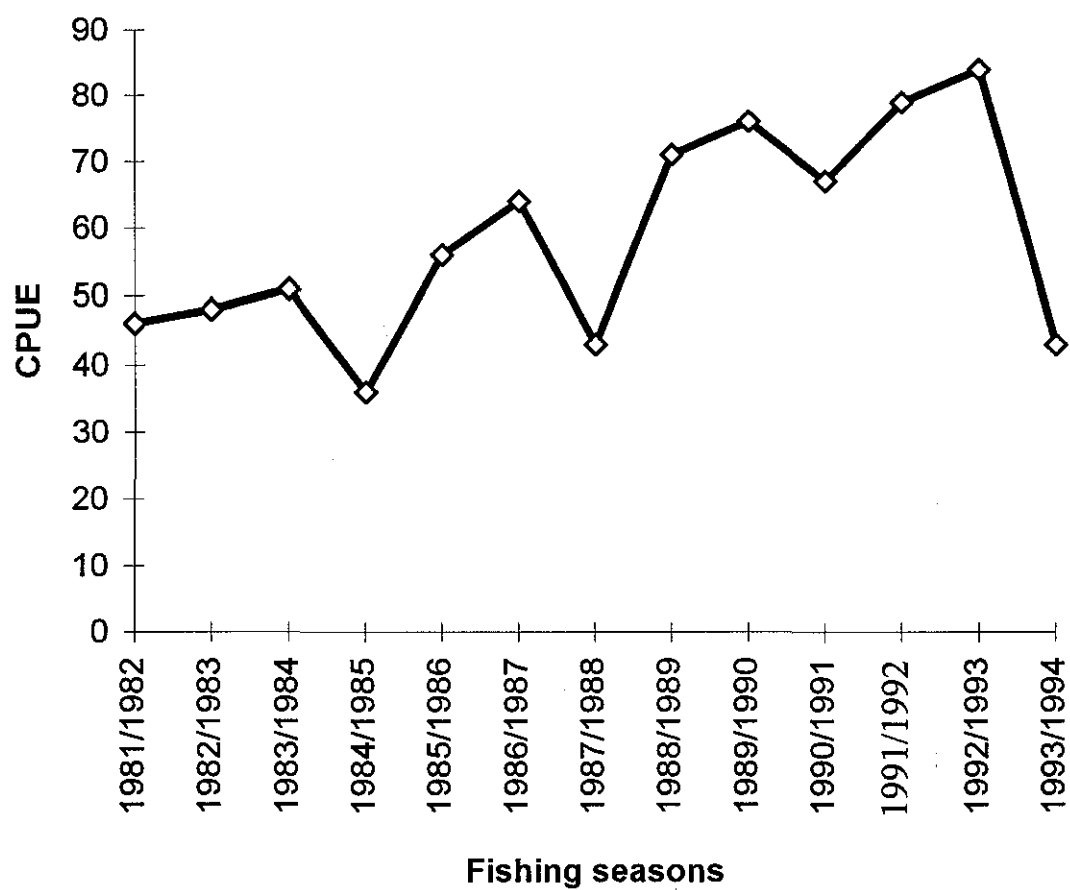


Figure 1.2.2 Catch per 1000 hooks (CPUE) in the Faroese fishery inside the EEZ since the 1982/83 fishing season. The catch is broken into wild and farmed fish. The seasons 1981/1982, 1983/1984 and 1984/1985 are not analysed yet.

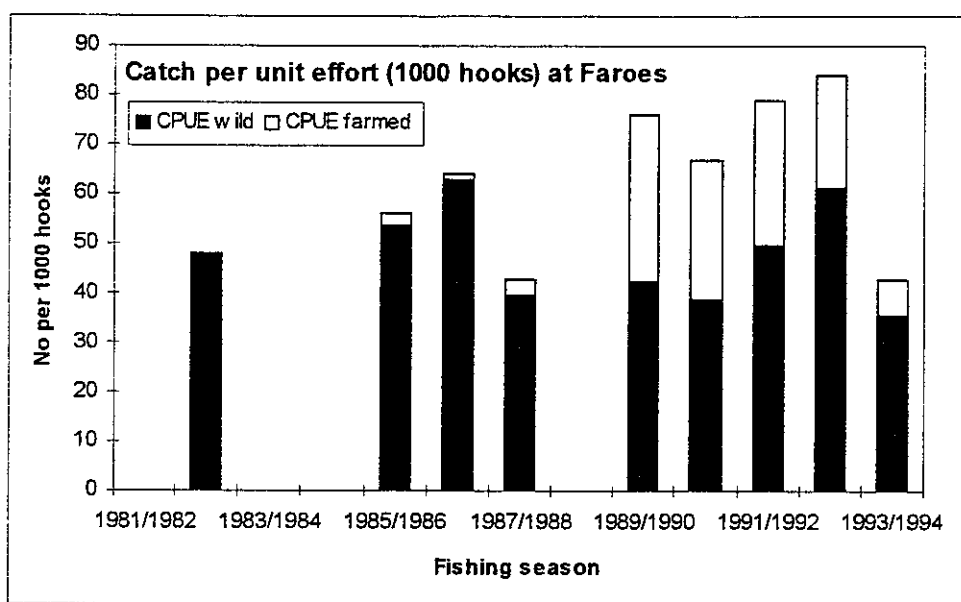


Figure 1.4.1 Extant exploitation of North American 2SW salmon stocks in Newfoundland-Labrador and Greenland commercial fisheries.

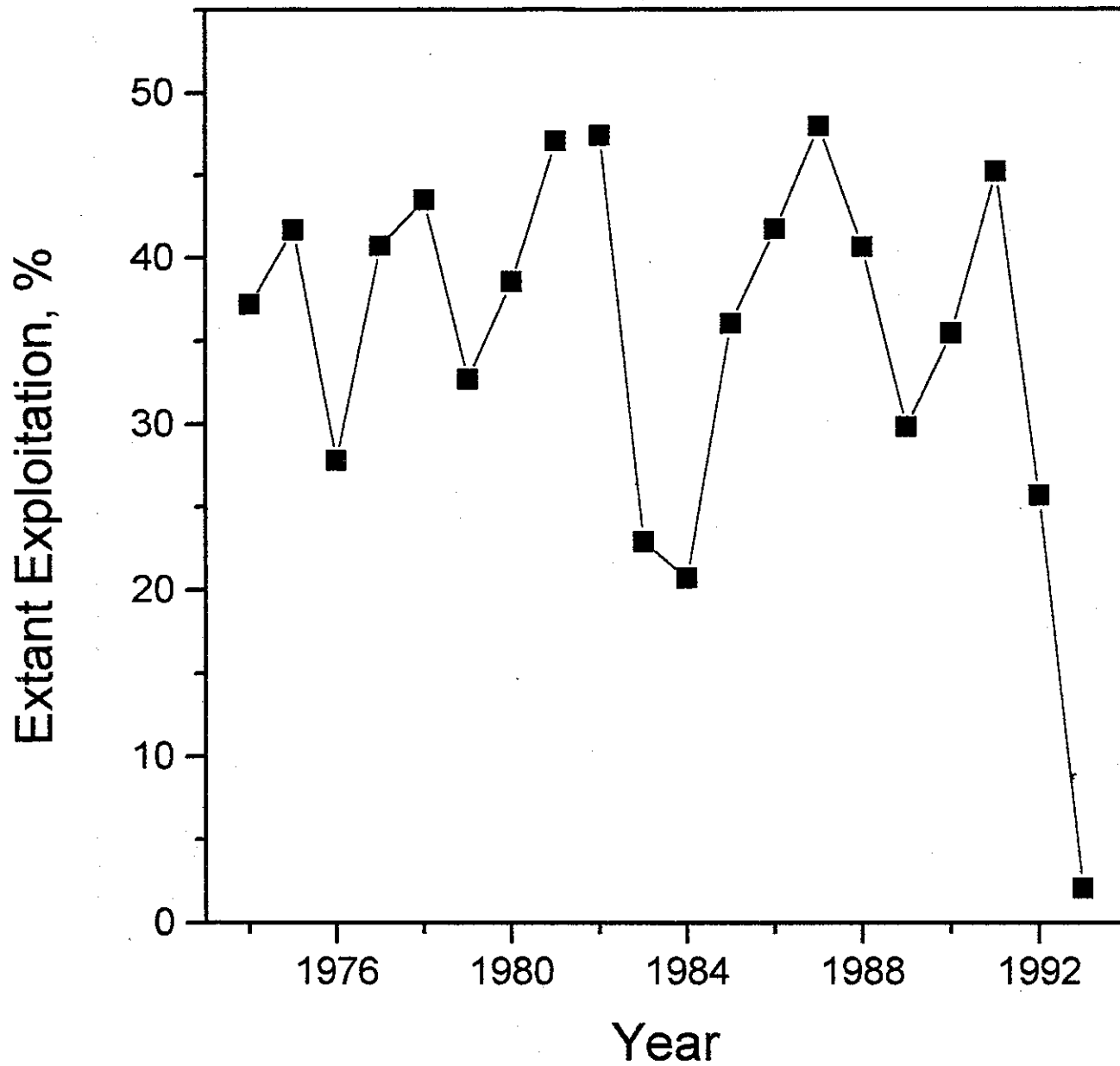


Figure 3.1.1 Pre-fishery abundance estimates of North American salmon, 1974-1993. Box plots show 5, 25, 50, 75, and 95% ranges of 200 stochastic realizations.

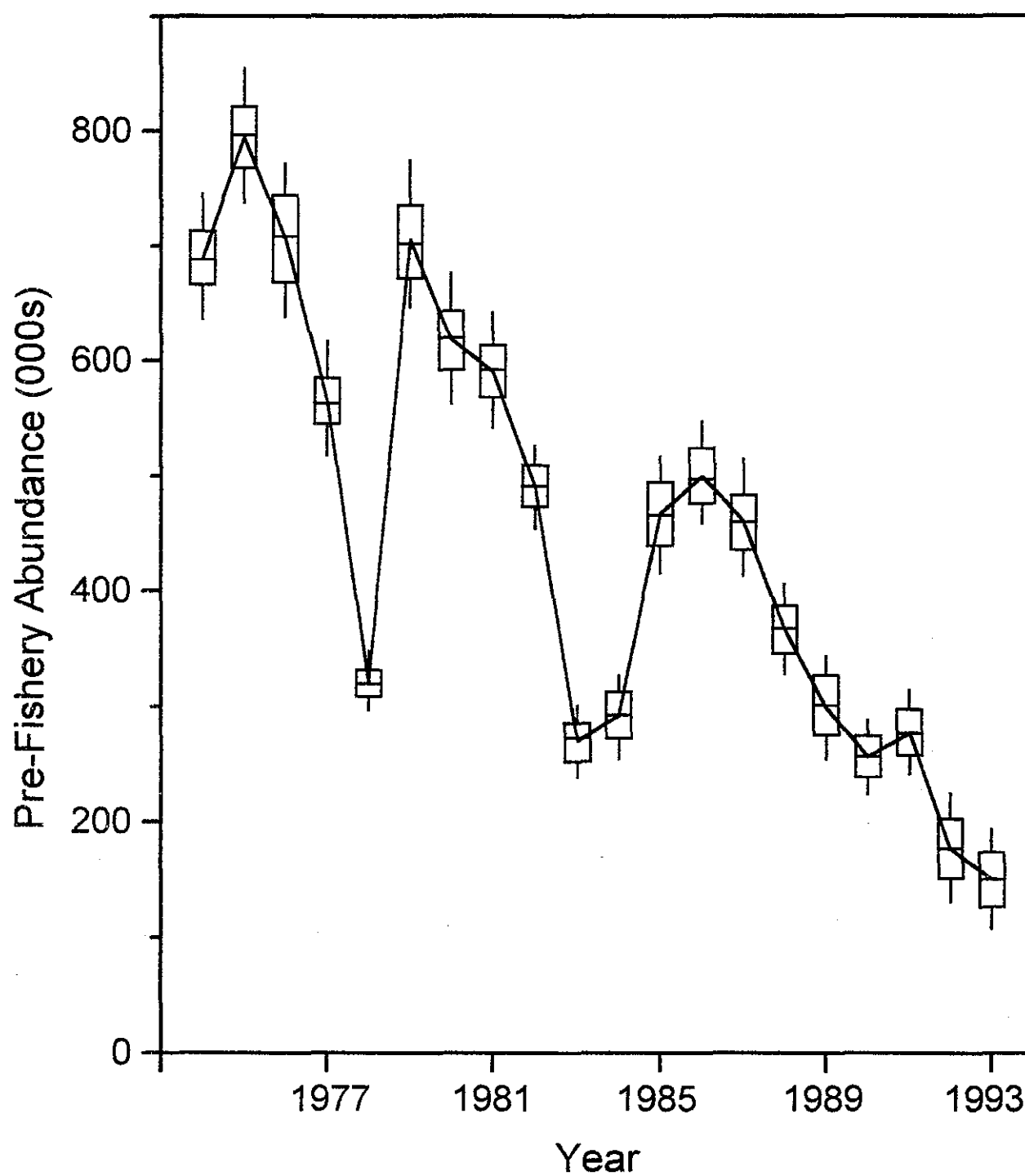


Figure 3.1.2 Residual analysis of the pre-fishery abundance regression estimate. A: Residual time series; B: Observed abundance versus residual.

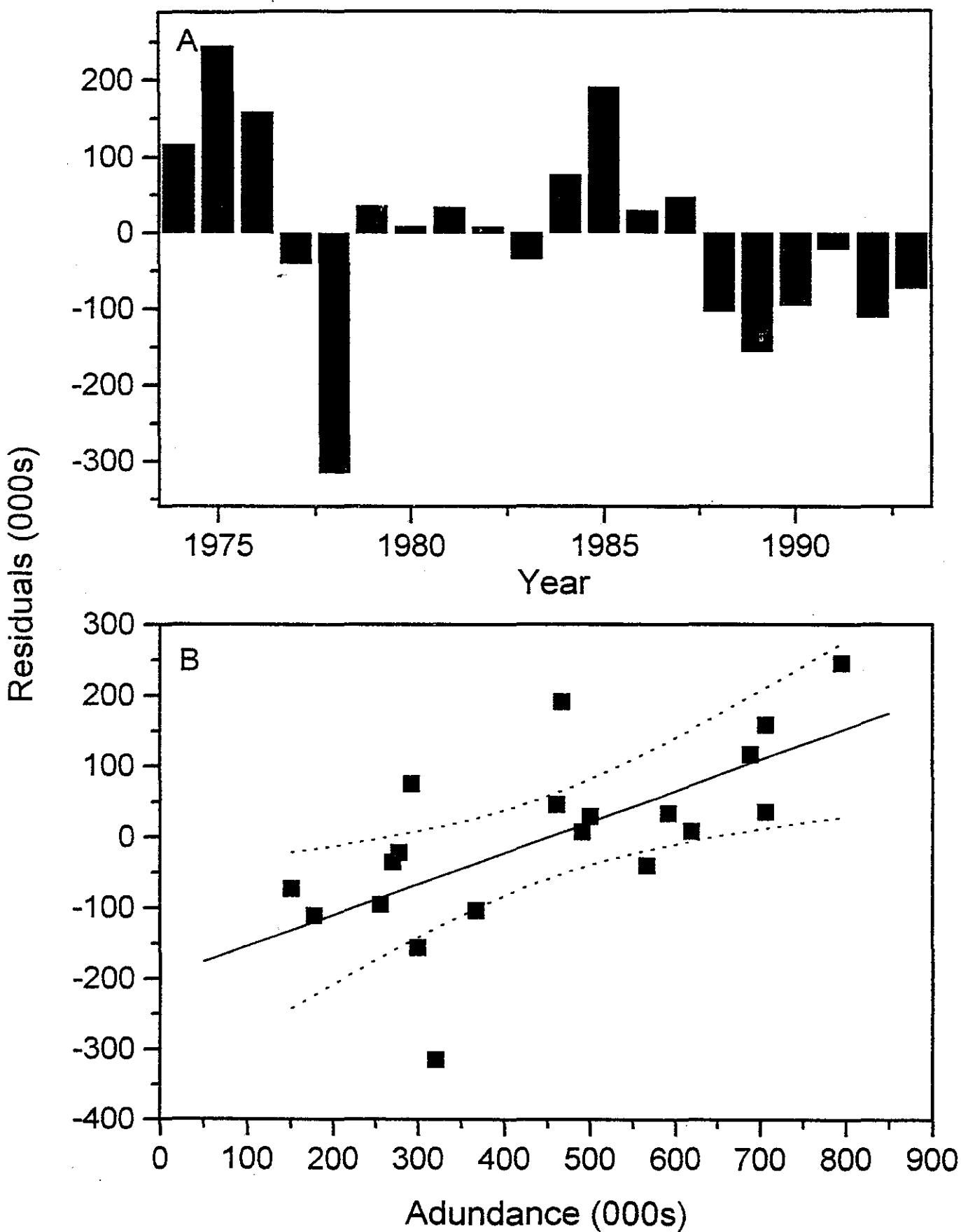


Figure 3.1.3 Comparison of the actual, predicted and unbiased predicted pre-fishery abundance values.

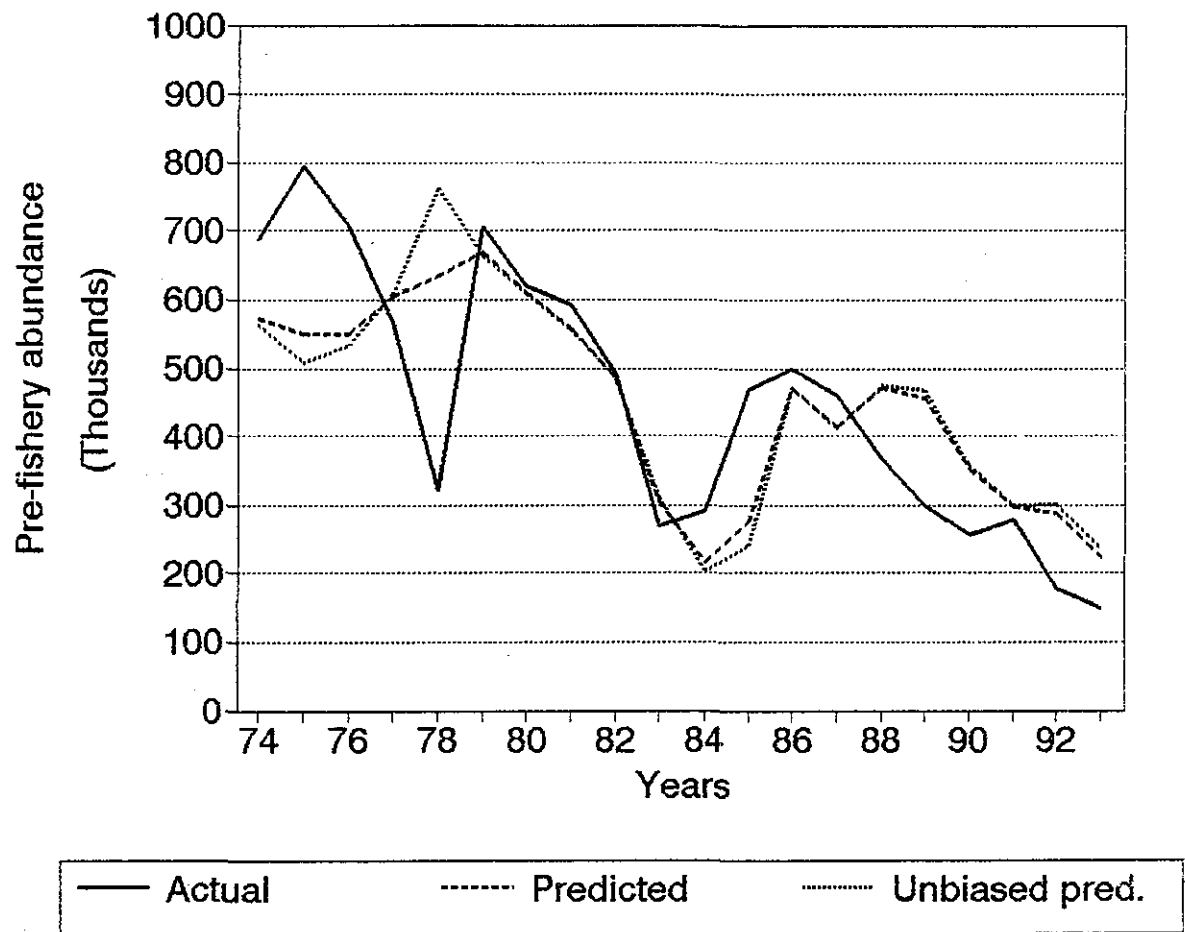


Figure 3.1.4 Pre-fishery Abundance and returns to North America

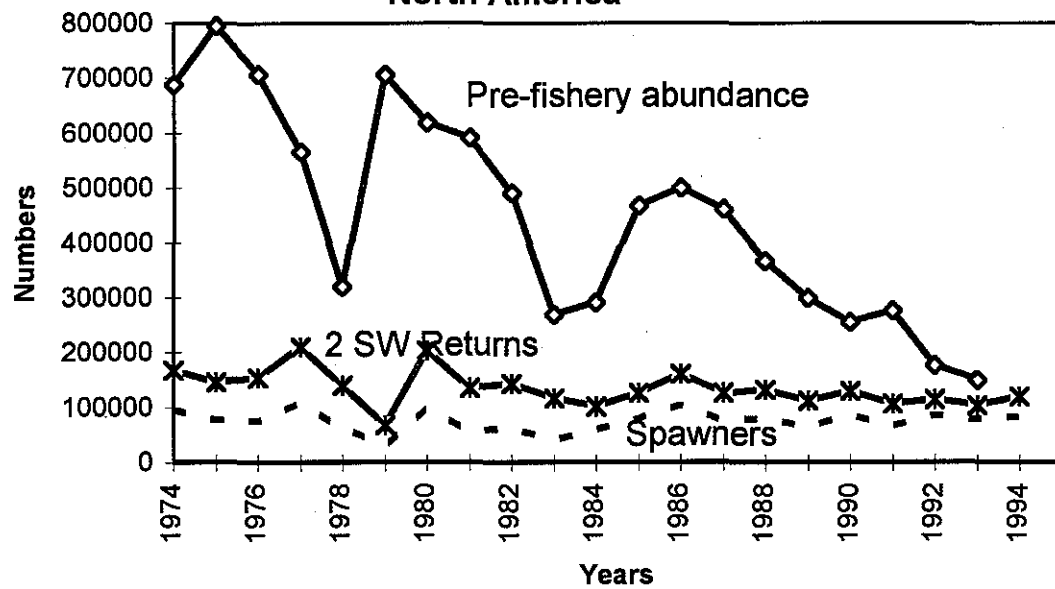
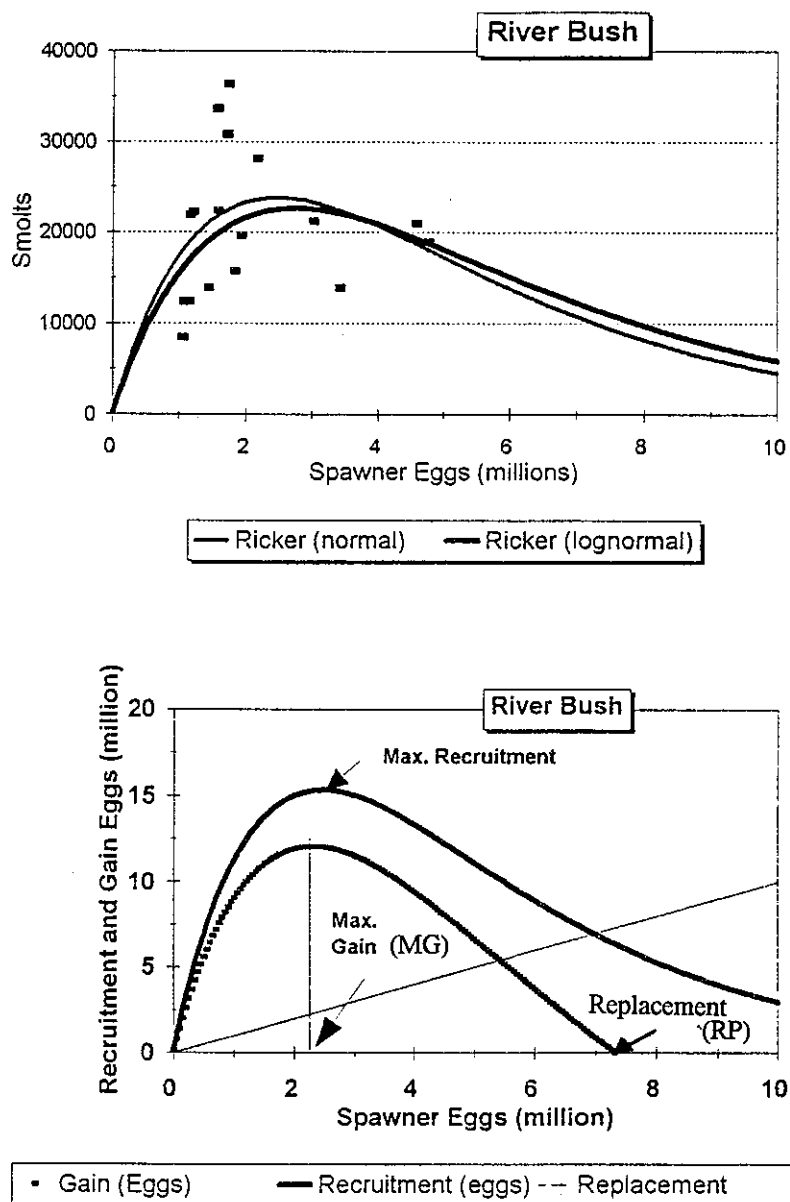


Figure 4.1.1

Analysis of stock-recruitment data for River Bush UK(N.Ireland).



Ricker model: $\text{Recruitment} = \alpha \cdot \text{Spawners} \cdot \exp(-\beta \cdot \text{Spawners})$

Results assuming lognormal error structure

alpha	0.024
beta	0.364 * E-06

Reference Points	Eggs (million)
Max. Gain (millions)	2.310
90% Max. Gain (millions)	3.385
Max. Recruitment	2.760
Replacement (millions)	7.335

Figure 4.2.1

Maximum and minimum of recruitment of maturing (solid lines) and non-maturing (dotted lines) 1SW salmon in Southern European stock complex.

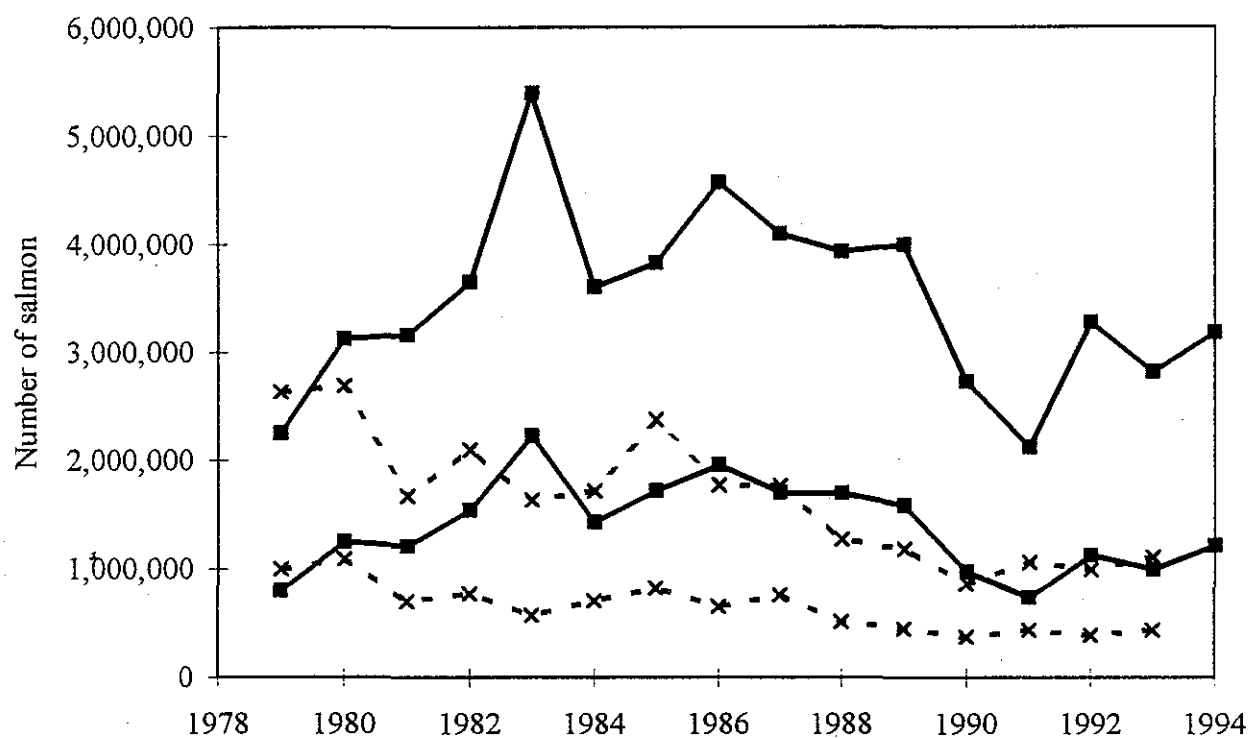
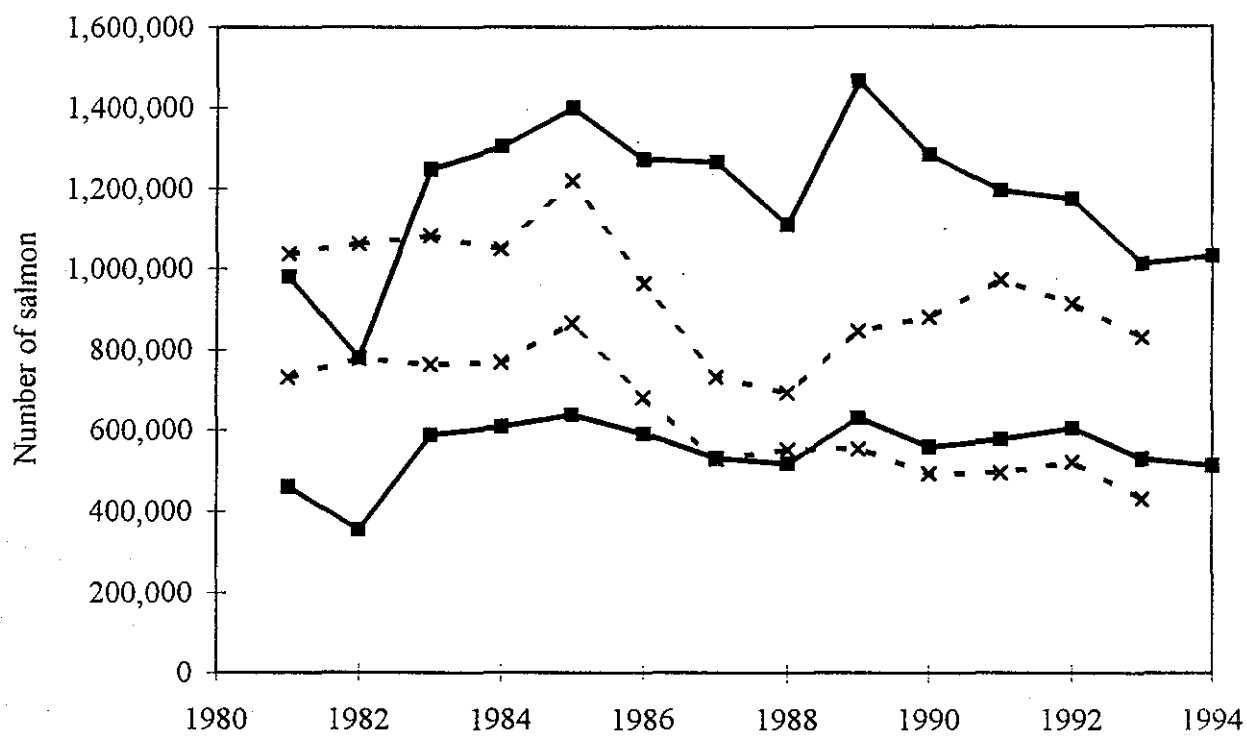


Figure 4.2.2

Maximum and minimum estimates of recruitment of maturing (solid lines) and non-maturing (dotted lines) 1SW salmon in Northern European stock complex.



APPENDIX 1

COMPUTATION OF CATCH ADVICE FOR WEST GREENLAND

The North American Spawning Target (SpT) for 2SW salmon has been set at 193,741 fish.

This number must be divided by the survival rate for the fish from the time of the West Greenland fishery to their return of the fish to home waters (11 months) to give the Spawning Target Reserve (SpR). Thus:

$$\text{Eq. 1.} \quad \text{SpR} = \text{SpT} * (\exp(11 * M)) \quad (\text{where } M = 0.01)$$

The Maximum Allowable Harvest (MAH) may be defined as the number of non-maturing 1SW fish that are available for harvest. This number is calculated by subtracting the Spawning Target Reserve from the pre-fishery abundance (PFA).

$$\text{Eq. 2.} \quad \text{MAH} = \text{PFA} - \text{SpR}$$

To provide catch advice for West Greenland it is then necessary to decide on the proportion of the MAH to be allocated to Greenland (f_{NA}). The allowable harvest of North American non-maturing 1SW salmon at West Greenland (NA1SW) may then be defined as

$$\text{Eq. 3.} \quad \text{NA1SW} = f_{NA} * \text{MAH}$$

The estimated number of European salmon that will be caught at West Greenland (E1SW) will depend upon the harvest of North American fish and the proportion of the fish in the West Greenland fishery that originate from North America [PropNA]. Because there are no samples for 1993, simple exponential smoothing of the observed 1978-1992 values of PropNA is used to generate a forecast for 1994. Thus

$$\text{Eq. 4.} \quad \text{E1SW} = (\text{NA1SW} / \text{PropNA}) - \text{NA1SW}$$

To convert the numbers of North American and European 1SW salmon into total catch at West Greenland in metric tonnes it is necessary to incorporate the mean weights of salmon for North America [WT1SWNA] and Europe [WT1SWE] and an adjustment for the age composition of the catch [ACF]. The quota (in tonnes) at Greenland is then estimated as

$$\text{Eq. 5.} \quad \text{Quota} = (\text{NA1SW} * \text{WT1SWNA} + \text{E1SW} * \text{WT1SWE}) * \text{ACF} / 1000$$

where

WT1SWNA = mean weight (kg) of North American salmon at Greenland, the 1994 value was forecasted as described below

WT1SWE = mean weight (kg) of European salmon at Greenland, the 1994 value was forecasted as described below

ACF = age correction factor for multi-sea winter salmon at Greenland based on the total weight of salmon caught divided by the weight of 1SW salmon.

Mean weights by continent [WT1SWNA, WT1SWE] and the age correction factor [ACF] for 1994 were forecasted from the 1978-1992 observations. The exponentially smoothed values were based on estimation of an optimal smoothing coefficient and are given in Section 3.3.

